9-0917

MONTGOMERY WATSON

Box 13

December 11, 1997

Mr. William W. Cocke, P.G.
Florida Department of Environmental Protection
Underground Injection Control Division
400 North Congress Avenue,
West Palm Beach, Florida 33401

SUBJECT: City of Fort Lauderdale Fiveash WTP ASR System
Aquifer Storage and Recovery Well ASR-1 and
Floridan Monitor Well FMW-1
Weekly Summary Report #1
FDEP Permit No. 0128340-002-UC
(Fort Lauderdale Project No. 9771)
(Montgomery Watson File No. 1324007.28090285/6.7.1)

Dear Mr. Cocke:

Montgomery Watson Americas, Inc. is pleased to submit the following Weekly Summary Report on behalf of the City of Ft. Lauderdale. This report is the first Weekly Summary Report for the City of Ft. Lauderdale Fiveash Water Treatment Plant (WTP) Aquifer Storage and Recovery System. The summary report covers the reporting period from November 28, 1997 at 0700 hours through December 8, 1997 at 0700 hours. In accordance with Specific Condition 4.D in the construction permit, the following information is attached to this document:

- Daily Engineer Reports
- Driller Shift Reports
- Lithologic Logs
- Core Lithologic Logs
- Geophysical Logs:
  - Pilot Hole
    - Dual Induction, Spontaneous Potential, Gamma Ray
    - Caliper, Gamma Ray
  - Reamed hole
    - Caliper, Gamma Ray
- Pad Monitor Well Sampling Results

3:15 PM

2328 - 10th Avenue North
Suite 501
Lake Worth, Florida
33461-6616

Tel: 561 586 8830
Fax: 561 586 8834

Serving the World's Environmental Needs

AQUIFER STORAGE AND RECOVERY WELL (ASR-1)

Drilling of the well began on November 29, 1997. The pilot hole was drilled to 471 feet below pad level (bpl) and geophysical logs were performed on November 30, 1997. Reaming commenced on December 1, 1997 and was completed to a depth of 210 feet bpl on December 2, 1997. Following geophysical logging of the reamed hole, 26-inch casing was set and cemented to 198 feet bpl on December 3, 1997. Pilot hole drilling resumed on December 4, 1997 and proceeded to a depth of 1,125 feet bpl on December 7, 1997. During pilot hole drilling between 950 feet bpl and 1,020 feet bpl, three intervals were cored. The first two cores yielded less than 10% recovery with the third core yielding approximately 80% recovery.

FLORIDAN MONITOR WELL (FMW-1)

No construction activities during the reporting period.

SHALLOW MONITOR WELL (SMW-1)

No construction activities during the reporting period.

PROPOSED FUTURE ACTIVITIES FOR NEXT REPORTING PERIOD

Preparations will be made for the completion of the following tasks:

AQUIFER STORAGE AND RECOVERY WELL (ASR-1)

During the second week of construction at the Fiveash site, geophysical logs will be run in the pilot hole to 1,125 feet bpl. Following receipt of casing depth approval, the hole will be reamed and 16-inch casing will be set and cemented to the approved depth

FLORIDAN MONITOR WELL (FMW-1)

No activities planned.

SHALLOW MONITOR WELL (SMW-1)

No activities planned.

DRILLING OBSERVATION AND TESTING

Drilling observation, testing, and sampling were conducted by Neil Johnson and Randy Skinner.

CONTRACTOR

Youngquist Brothers, Inc.
Drilling Superintendent: Jay Swartzentruber

SUB-CONTRACTORS

Florida Geophysical Logging
Florida Cementing, Inc.

If you should have any questions, please do not hesitate to contact Anne M. Murray, P.G. at 954-472-0300.

Sincerely,

Thomas A. Wham for Anne Murray

Anne M. Murray, P.G.
Project Manager

AMM/jg

cc: TAC List (w/ attachments)
Maurice Tobon (w/o attachments)
Wayne Welch (w/o attachments)
Armando Sampedro (w/ attachments)
Randy Skinner (w/ attachments)
Neil Johnson (w/ attachments)

SOUTHEAST DISTRICT U.I.C.
TECHNICAL ADVISORY COMMITTEE
(Rev01DEC97)

Agency	Address	TAC Member
FDEP (SED):	FDEP, UIC Permitting P.O. Box 15425 West Palm Beach, FL 33416 Telephone (561) 681-6600 FAX: (561) 681-6760 INTERNET: username@WPB1.dep.state.fl.us	Bill Cocke, TAC Chairman (Cocke_W) Len Fishkin
FDEP (TAL):	FDEP, Bureau of Drinking Water and Ground Water Resources - UIC 2600 Blair Stone Road Tallahassee, FL 32399-2400 (850) 921-9412 FAX: (850) 414- 9031 INTERNET: username@dep.state.fl.us	Cathy McCarty
USEPA:	USEPA, Region IV 345 Courtland Street, N.E. Atlanta, Georgia 30365 (404) 347-3379 FAX: (404) 347-1799	Nancy Marsh - Permitting Scott Hoskins, Comp./Enf.
USGS:	USGS, Water Resources Division 9100 N.W. 36th St., Suite 107 Miami, FL 33178 (305) 594-0655 FAX: (305) 526-2881 INTERNET: username@ws01sflmia.er.usgs.GOV	Ron Reese (Rsresse) (DC & BC. PBC)
SFWMD:	SFWMD, P.O. Box 24680 3301 Gun Club Road West Palm Beach, FL 33416 (561) 686-8800, Ext. 6853 FAX: (407) 687-6436	Steven D. Anderson

BCDNRP	BCDNRP 218 S.W. 1st. Avenue Fort Lauderdale, Florida 33301 (954) 519-1256 FAX: (954) 519-1496	Garth Hinkle
BCPHU	BCPHU 2421 S.W. 6th Avenue Ft. Lauderdale, FL 33315 (954) 467-4846 FAX: (954) 467-4898	Phong Nguyen

MONTGOMERY WATSON

ASR-1 DAILY SHIFT REPORT

DATE(S): 11/21/1997
HOURS WORKED: 10:00 - 12:00

CITY OF FORT LAUDERDALE FIVEASH WTP ASR WELL SYSTEM

Sun	Mon	Tue	Wed	Thr	Fri	Sat
					x	

JOB NUMBER: 1324007.28090290

CONTRACTOR: Youngquist Brothers, Inc.

Weather	Clear	Overcast	Rain	Heavy Rain
				x
Temperature	32 - 50	50 - 70	70 - 85	> 85
			x	
Wind	Still	Medium	High	
		x		
Humidity	Dry	Moderate	Humid	**Report No.**
			x	1

SHIFT SUMMARY

OBSERVER: M. Randal Skinner
DRILLER:
ACTIVITY: Water Table Monitor Well Sampling. Site Work
SUB CONTRACTORS: Ardamen and Associates
FORMATION SAMPLES:
WATER SAMPLES:
TESTING:

START DEPTH: 0
END DEPTH: 0

TIME	DESCRIPTION
10:00	On site. YBI is on site, performing set-up work. Ardamen is on site, and sampling surface water monitor wells.
1040	Spoke with Fl. Lauderdale lab personnel about sampling procedures. Sampled pad monitor wells.
1200	Off Site.

MONTGOMERY WATSON

ASR-1 DAILY SHIFT REPORT

DATE(S): 11/25/97
HOURS WORKED: 0915 - 1115

CITY OF FORT LAUDERDALE FIVEASH WTP ASR SYSTEM

Sun	Mon	Tue	Wed	Thr	Fri	Sat
		x				

JOB NUMBER: 1324007.28090290

CONTRACTOR: Youngquist Brothers, Inc.

Weather	Clear	Overcast	Rain	Heavy Rain
		x		
Temperature	32 - 50	50 - 70	70 - 85	> 85
			x	
Wind	Still	Medium	High	
	x			
Humidity	Dry	Moderate	Humid	**Report No.**
			x	2

SHIFT SUMMARY

OBSERVER: Neil Johnson
DRILLER: Ronnie Thames
ACTIVITY: Pre-construction meeting / Rigging up to drill
SUB CONTRACTORS:
FORMATION SAMPLES:
WATER SAMPLES:
TESTING:

START DEPTH: 0
END DEPTH: 0

TIME	DESCRIPTION
09:15	NAJ on site
	YBI rigging up for ASR
	Unloaded field conductivity meter, chloride kits, specs, drawings, and permits into trailer
10:00	Pre-construction meeting at WTP
11:15	End meeting. NAJ off site

MONTGOMERY WATSON

ASR-1 DAILY SHIFT REPORT

DATE(S): 11/28/97
HOURS WORKED: 1230 - 1430

CITY OF FORT LAUDERDALE FIVEASH WTP ASR SYSTEM

Sun	Mon	Tue	Wed	Thr	Fri	Sat
					x	

JOB NUMBER: 1324007.28090290

CONTRACTOR: Youngquist Brothers, Inc.

Weather	Clear	Overcast	Rain	Heavy Rain
		x		
Temperature	32 - 50	50 - 70	70 - 85	> 85
			x	
Wind	Still	Medium	High	
	x			
Humidity	Dry	Moderate	Humid	**Report No.**
			x	3

SHIFT SUMMARY

OBSERVER: Neil Johnson
DRILLER: Ronnie Thames
ACTIVITY: Sample pad monitor wells
SUB CONTRACTORS:
FORMATION SAMPLES:
WATER SAMPLES: ASR-1 and FMW-1 Weekly Pad Monitor Well Samples
TESTING:

START DEPTH: 0
END DEPTH: 0

TIME **DESCRIPTION**

12:30 NAJ on site
YBI mixing drilling mud. Sanders lab scheduled by Jay to sample PMW today.

13:00 YBI will try to locate lab results from sampling event 11/21/97.
YBI provided 8 sample bottles for today's sampling of the PMW

13:30 Sampled ASR-1 PMW

Well	Held	Read	Depth to Water	Temperature
PMW-1 / N	10	1.52	8.48	82.0
PMW-2 / W	10	1.30	8.70	82.0
PMW-3 / E	10	1.50	8.50	83.0
PMW-4 / S	9	8.02	8.02	82.0

13:50 Sampled FMW-1 PMW

Well	Held	Read	Depth to Water	Temperature
PMW-1 / N	9	1.65	7.35	80.0
PMW-2 / W	8	0.49	7.51	80.5
PMW-3 / E	9	1.29	7.71	80.5
PMW-4 / S	9	1.35	7.65	80.0

Several of the wells contain very dirty water. Wells should be pump-developed.

14:30 Loading drill pipe onto rig floor. NAJ off site

MONTGOMERY WATSON

ASR-1 DAILY SHIFT REPORT

DATE(S): 11/29/97
HOURS WORKED: 11:15 - 22:00

CITY OF FORT LAUDERDALE FIVEASH WTP ASR SYSTEM

Sun	Mon	Tue	Wed	Thr	Fri	Sat
						x

JOB NUMBER: 1324007.28090290

CONTRACTOR: Youngquist Brothers, Inc.

Weather	Clear	Overcast	Rain	Heavy Rain
			x	
Temperature	32 - 50	50 - 70	70 - 85	> 85
			x	
Wind	Still	Medium	High	
	x			
Humidity	Dry	Moderate	Humid	**Report No.**
			x	4

SHIFT SUMMARY

OBSERVER: Neil Johnson
DRILLER: Ronnie Thames
ACTIVITY: Drilling 12-1/4 pilot hole
SUB CONTRACTORS:
FORMATION SAMPLES:
WATER SAMPLES:
TESTING:

START DEPTH: 0
END DEPTH: 200

TIME	DESCRIPTION
15:45	NAJ on site
	Drilling at 110 ft. – 2 stands drill collar and bit – WOB = 3K
16:10	KD at 110 ft.
16:25	Made connection – DP stand #1
17:25	Took cuttings sample 120-130 ft.
18:30	KD at 168
	Cameron Webster (driller) on site. Installing electric pump on pad.
19:05	Drilling at 197 ft. WOB = 3500 ROP = 2-3 min/ft.
19:20	Stop drilling at 200 ft. Problem with mud pump
20:45	YBI will replace mud pump
21:45	New pump on site
	YBI will schedule loggers for 07:00 tomorrow. Will call at 06:00 if not ready.
	Will resume drilling tonight stopping at 400 ft. or well into clay.
22:00	NAJ off site.

MONTGOMERY WATSON

ASR-1 DAILY SHIFT REPORT

DATE(S): 11/30/97
HOURS WORKED: 06:30 - 14:45

CITY OF FORT LAUDERDALE FIVEASH WTP ASR SYSTEM

Sun	Mon	Tue	Wed	Thr	Fri	Sat
x						

JOB NUMBER: 1324007.28090290

CONTRACTOR: Youngquist Brothers, Inc.

Weather	Clear	Overcast	Rain	Heavy Rain
		x		
Temperature	32 - 50	50 - 70	70 - 85	> 85
			x	
Wind	Still	Medium	High	
	x			
Humidity	Dry	Moderate	Humid	**Report No.**
			x	5

SHIFT SUMMARY

OBSERVER: Neil Johnson
DRILLER: Ronnie Thames
ACTIVITY: Drilling 12-1/4 pilot hole
SUB CONTRACTORS:
FORMATION SAMPLES:
WATER SAMPLES:
TESTING:

START DEPTH: 408
END DEPTH: 470

TIME	DESCRIPTION
06:30	NAJ on site
	KD at 408 ft. no clay
07:10	Between 410 and 420 ft. greenish clayey sand. Repairing desander
07:20	Both desanding units working. Drilling very fast 2-3 ft/min
07:38	Geolograph not working well.
	Drilling at 461 ft. WOB = 3800
07:45	KD at 470 ft.
	Cuttings are still green clayey sand. Very soft drilling
08:00	Circulating and thinning mud
08:45	Making chip trays
10:00	FGL truck on site
11:55	Log TD = 471 ft. Begin caliper/gamma log.
12:20	End log. Switching tools
13:40	Begin DI/SP log.
14:00	End log. FGL rigging down.
14:45	YBI will call when ready to begin reaming.
	NAJ off site

MONTGOMERY WATSON

ASR-1 DAILY SHIFT REPORT

DATE(S): 12/1/97
HOURS WORKED: 07:30 - 15:30

CITY OF FORT LAUDERDALE FIVEASH WTP ASR SYSTEM

Sun	Mon	Tue	Wed	Thr	Fri	Sat
	x					

JOB NUMBER: 1324007.28090290

CONTRACTOR: Youngquist Brothers, Inc.

Weather	Clear	Overcast	Rain	Heavy Rain
	x			
Temperature	32 - 50	50 - 70	70 - 85	> 85
		x		
Wind	Still	Medium	High	
	x			
Humidity	Dry	Moderate	Humid	**Report No.**
	x			6

SHIFT SUMMARY

OBSERVER: Neil Johnson
DRILLER: Ronnie Thames
ACTIVITY: Reaming for 26-in. casing
SUB CONTRACTORS: Masonry crew, Rinker
FORMATION SAMPLES:
WATER SAMPLES:
TESTING:

START DEPTH: 470
END DEPTH: 470

TIME	DESCRIPTION
07:30	NAJ on site
	BHA rigged up
08:30	Masonry crew on site – block not delivered.
	Received Sanders' pad monitor well data from YBI.
09:00	Anne Murray on site to discuss schedule, specs, permits, and casing setting depth (190-200 ft.)
	Decided to run packer test on FMW-1.
09:45	Begin reaming
10:00	KD at 28 ft.
	Making connection
10:25	Resumed reaming from 28 ft.
11:15	Tim Case from Sanders Laboratory on site
11:30	Reaming at 55 ft. WOB = 4K
11:50	Took PMW samples (11-28-97) to Susan Chen at CITY lab
11:55	Rinker on site with block.
13:30	Received results from PMW sampling (11-21-97) from CITY
13:45	Submitted chain-of-custody for (11-28-97) samples to CITY
13:55	Reaming at 80 ft. WOB = 6K.
	Masons 2/3 complete. Pad is chipped along eastern edge underneath block.

14:00 Edwards Electric on site for trailer electric.
RMS on site.
14:30 Measured 26-in. Casing
header 40.21 ft., 40.33 ft., 40.28 ft., 40.30 ft., and 40.29 ft.
15:30 NAJ off site

MONTGOMERY WATSON

ASR-1 DAILY SHIFT REPORT

DATE(S): 12/2/1997
HOURS WORKED: 9:00 - 13:00

CITY OF FORT LAUDERDALE FIVEASH WTP ASR WELL SYSTEM

Sun	Mon	Tue	Wed	Thr	Fri	Sat
		X				

JOB NUMBER: 1324007.28090290

CONTRACTOR: Youngquist Brothers, Inc.

Weather	Clear	Overcast	Rain	Heavy Rain
		X		
Temperature	32 - 50	50 - 70	70 - 85	> 85
			x	
Wind	Still	Medium	High	
		x		
Humidity	Dry	Moderate	Humid	**Report No.**
		X		7

SHIFT SUMMARY

OBSERVER: M. Randal Skinner
DRILLER: Ronnie Thames
ACTIVITY: Ream hole to 200 feet for surface casing
SUB CONTRACTORS:
FORMATION SAMPLES:
WATER SAMPLES:
TESTING:

START DEPTH: 75
END DEPTH: 200

TIME	DESCRIPTION
0910	On site.
	Met with Anne Murray about status of project.
	Ream has progressed to 157 feet bpl.
1000	Spoke with contractor about schedule for geophysical logging.
	Loggers will be onsite at 4:00 am Wendsday to calpier the ream.
1100	Spoke with driller about keeping WOB records.
1245	Off Site.

MONTGOMERY WATSON

ASR-1 DAILY SHIFT REPORT

DATE(S): 12/3/1997
HOURS WORKED: 3:50 - 17:00

CITY OF FORT LAUDERDALE FIVEASH WTP ASR WELL SYSTEM

Sun	Mon	Tue	Wed	Thr	Fri	Sat
			x			

JOB NUMBER: 1324007.28090290

CONTRACTOR: Youngquist Brothers, Inc.

Weather	Clear	Overcast	Rain	Heavy Rain
		X		
Temperature	32 - 50	50 - 70	70 - 85	> 85
			x	
Wind	Still	Medium	High	
		x		
Humidity	Dry	Moderate	Humid	**Report No.**
		X		8

SHIFT SUMMARY

OBSERVER: M. Randal Skinner and Neil Johnson
DRILLER: Ronnie Thames
ACTIVITY: Set and Cement Surface Casing
SUB CONTRACTORS: Florida Geophysical, Florida Cement
FORMATION SAMPLES:
WATER SAMPLES:
TESTING:

START DEPTH: 200
END DEPTH: 200

TIME	DESCRIPTION
0330	ON Site
	Waiting on loggers.
0445	Loggers are rigged up, but having problems with computer system.
0530	Running log.
0540	Rig down loggers.
0600	Begin 26 inch casing run.
0850	End 26 inch casing run. Five stands in the hole. Setting depth is 198.4 feet bls.
0910	Rig up to run cement.
1100	Sending pre-flush @ 3 bbls/min.
1132	End Stage #1. 90 bbls of neat pumped.
	Rig down cement truck.
1148	Head pressure at 42 PSI.
1330	Head pressure at 0 PSI.
1610	Tag annulus at 20 feet bls.
1700	Drilling will re-start at 0000 hr.
	Off Site.

MONTGOMERY WATSON

ASR-1 DAILY SHIFT REPORT

DATE(S): 12/4/97-12/5/97
HOURS WORKED: 09:30 - 01:30

CITY OF FORT LAUDERDALE FIVEASH WTP ASR SYSTEM

Sun	Mon	Tue	Wed	Thr	Fri	Sat
				x		

JOB NUMBER: 1324007.28090290

CONTRACTOR: Youngquist Brothers, Inc.

Weather	Clear	Overcast	Rain	Heavy Rain
			x	x
Temperature	32 - 50	50 - 70	70 - 85	> 85
			x	
Wind	Still	Medium	High	
	x	x		
Humidity	Dry	Moderate	Humid	**Report No.**
			x	9

SHIFT SUMMARY

OBSERVER: Neil Johnson/Randy Skinner
DRILLER: Ronnie Thames/Cameron Webster
ACTIVITY: Drilling 12-1/4 pilot hole
SUB CONTRACTORS:
FORMATION SAMPLES:
WATER SAMPLES:
TESTING:

START DEPTH: 470
END DEPTH: 949

TIME	DESCRIPTION
09:30	NAJ on site
09:40	Drilling at 579 ft. Driller noticed possible change in formation at 574 ft. Present ROP = 2 min/ft
10:06	Drilling at 587 ft. WOB = 4K ROP = 2min/ft.
10:20	KD at 591 ft.
11:40	Drilling at 627 ft. WOB = 5K ROP = 2-3 min/ft
	Cuttings 60% LS--white, recrystallized, porous 40% CLAY--olive-green.
12:00	Drilling at 638 ft. WOB = 6K ROP = 2-3 min/ft.
	50% LS—white to gray 50% CLAY—olive-green
12:20	Drilling at 651 ft. WOB = 6K ROP = 1 min/ft.
12:50	Drilling at 665 ft. WOB = 6K ROP = <1 min/ft.
13:00	Loading tanker with fluids from cuttings pit.
	ASR-1 PMW-3/East is underwater from parking lot runoff
13:15	Received copy of PMW results (11-28-97) from CITY
13:30	KD at 710 ft.
14:28	Drilling at 735 ft. WOB = 4K ROP =- <1 min/ft
15:16	Drilling at 768 ft. WOB = 5K ROP = 1 min/ft
15:18	KD at 771 ft.
16:05	Drilling at 771 ft. WOB = 5K ROP = <1 min/ft

16:50 KD at 831 ft.
17:20 Drilling at 847 ft. WOB = 8K ROP =- <1 min/ft
Cuttings contain chert nodules
17:30 Drilling at 856 ft.
17:32 Drilling at 860 ft. Driller noted harder material
17:59 Drilling at 873 ft. WOB = 8K ROP = 1 min/ft
18:15 Drilling at 885 ft.
18:20 KD at 891 ft.
18:42 Drilling at 894 ft. WOB = 10K ROP = <2 min/ft.
18:50 RMS on site
18:55 Drilling at 900 ft. 95% CLAY/SILT 5% LS—white, soft encountered in 1-2 ft.-thick units
20:10 Drilling at 935 ft.
21:00 Stop drilling at 949 ft. Prepare to core
23:00 Tight hole. Driller will run wiper trip and core in the a.m.
01:00 Core will not occur until morning tower
01:30 RMS off site.

MONTGOMERY WATSON

ASR-1 DAILY SHIFT REPORT

DATE(S): 12/5/97
HOURS WORKED: 0730 - 1630

CITY OF FORT LAUDERDALE FIVEASH WTP ASR SYSTEM

Sun	Mon	Tue	Wed	Thr	Fri	Sat
					x	

JOB NUMBER: 1324007.28090290

CONTRACTOR: Youngquist Brothers, Inc.

Weather	Clear	Overcast	Rain	Heavy Rain
		x		
Temperature	32 - 50	50 - 70	70 - 85	> 85
		x		
Wind	Still	Medium	High	
		x		
Humidity	Dry	Moderate	Humid	**Report No.**
			x	10

SHIFT SUMMARY

OBSERVER: Neil Johnson
DRILLER: Ronnie Thames
ACTIVITY: Sampled pad monitor wells / coring
SUB CONTRACTORS:
FORMATION SAMPLES:
WATER SAMPLES: ASR-1 and FMW-1 Weekly Pad Monitor Well Samples
TESTING:

START DEPTH: 950
END DEPTH: 950

TIME	DESCRIPTION
07:30	NAJ on site YBI running wiper trips.
08:00	Sampled FMW-1 PMW

Well	Depth to Water	Temperature
PMW-1 / N	6.53	26.5
PMW-2 / W	6.67	27.0
PMW-3 / E	6.90	26.0
PMW-4 / S	6.82	27.0

08:30 Sampled ASR-1 PMW

Well	Depth to Water	Temperature
PMW-1 / N	7.64	27.5
PMW-2 / W	7.89	27.5
PMW-3 / E	6.61	27.0
PMW-4 / S	7.18	26.5

09:30 TOOH for coring.

10:00 Checked heat numbers on 16-inch casing. No mill certs for Mexican pipe (heat numbers 16625 and 16624). YBI will look into this.

10:50 TIH with core barrel

12:45 Tagged bottom of hole at 941 ft. then lost circulation
13:45 Unable to regain circulation. TOOH
15:30 Mud and rocks in ball seat. Will TIH with bit to clean hole.
16:30 NAJ off site.

MONTGOMERY WATSON

ASR-1 DAILY SHIFT REPORT

DATE(S): 12/6/97
HOURS WORKED: 1040 - 1910

CITY OF FORT LAUDERDALE FIVEASH WTP ASR SYSTEM

Sun	Mon	Tue	Wed	Thr	Fri	Sat
						x

JOB NUMBER: 1324007.28090290

CONTRACTOR: Youngquist Brothers, Inc.

Weather	Clear	Overcast	Rain	Heavy Rain
	x			
Temperature	32 - 50	50 - 70	70 - 85	> 85
		x		
Wind	Still	Medium	High	
		x		
Humidity	Dry	Moderate	Humid	**Report No.**
	x			11

SHIFT SUMMARY

OBSERVER: Neil Johnson
DRILLER: Ronnie Thames
ACTIVITY: Coring during pilot hole
SUB CONTRACTORS:
FORMATION SAMPLES:
WATER SAMPLES:
TESTING:

START DEPTH: 949
END DEPTH: 960

TIME	DESCRIPTION
10:40	NAJ on site
	Circulating hole KD with DP #5
10:50	Connecting DP #6 to core barrel string
10:55	Lost circulation at approximately 320 ft.
11:30	Could not regain circulation -- TOH
12:00	Laid down inner core barrel
12:10	Limestone gravel and clay in ball seat of core barrel – trying to determine where rocks came from
12:15	Cleaning coring pump
12:30	Found rag and a few rocks in pump. Will try again. YBI will call when DP #15 in hole and circulating.
12:50	NAJ off site
17:20	NAJ on site – Ball already dropped. Circulating at 948 ft.
17:24	Begin coring at 948 feet
17:39	Stop coring at 960 feet. Raised core barrel and tagged bottom at 960 feet.
17:40	TOH w/ core barrel
18:50	Recovered approx. 1 ft. of core. Will TIH with bit to clean hole
19:10	NAJ off site

MONTGOMERY WATSON

ASR-1 DAILY SHIFT REPORT

DATE(S): 12/6-7/1997
HOURS WORKED: 21:00 - 07:00

CITY OF FORT LAUDERDALE FIVEASH WTP ASR WELL SYSTEM

Sun	Mon	Tue	Wed	Thr	Fri	Sat
x						x

JOB NUMBER: 1324007.28090290

CONTRACTOR: Youngquist Brothers, Inc.

Weather	Clear	Overcast	Rain	Heavy Rain
		X		
Temperature	32 - 50	50 - 70	70 - 85	> 85
	x			
Wind	Still	Medium	High	
		x		
Humidity	Dry	Moderate	Humid	**Report No.**
	x			12

SHIFT SUMMARY

OBSERVER: M. Randal Skinner and Neil Johnson
DRILLER: Cameron Webster
ACTIVITY: Cutting Core at 974 feet.
SUB CONTRACTORS:
FORMATION SAMPLES:
WATER SAMPLES:
TESTING:

START DEPTH: 974
END DEPTH: 986

TIME	DESCRIPTION
2100	On site.
	TIH to drill out core hole.
2250	Drilling out core hole at 960 feet bls.
2310	Picking core depth at 974 feet.
0300	TOOH for core run.
0300	TIH with core barrel.
0600	Circulating on bottom.
0617	Begin core run. 60 PSI, 2-4 K on bit.
0630	End core run. First 2 feet were very competent.
0700	TOOH with core.
	Off Site

MONTGOMERY WATSON

ASR-1 DAILY SHIFT REPORT

DATE(S): 12/7/97-12/8/97
HOURS WORKED: 1115 - 0125

CITY OF FORT LAUDERDALE FIVEASH WTP ASR SYSTEM

Sun	Mon	Tue	Wed	Thr	Fri	Sat
x	x					

JOB NUMBER: 1324007.28090290

CONTRACTOR: Youngquist Brothers, Inc.

Weather	Clear	Overcast	Rain	Heavy Rain
	x			
Temperature	32 - 50	50 - 70	70 - 85	> 85
		x		
Wind	Still	Medium	High	
		x		
Humidity	Dry	Moderate	Humid	**Report No.**
	x			13

SHIFT SUMMARY

OBSERVER: Neil Johnson
DRILLER: Ronnie Thames/Cameron Webster
ACTIVITY: Drilling 12-1/4 pilot hole to 1,125 ft.
SUB CONTRACTORS:
FORMATION SAMPLES:
WATER SAMPLES:
TESTING:

START DEPTH: 987
END DEPTH: 1125

TIME	DESCRIPTION
11:15	NAJ on site
	Bit at 987 ft., bottom of the previous core interval
11:25	Resume drilling at 987 ft. WOB = 4K ROP = <1 min/ft.
	90% LS-white to gray
11:34	Drilling at 1,000 ft. WOB = 4K
11:40	Drilling at 1,003 ft. WOB = 4K ROP = 6 min/ft Harder material
12:00	Drilling at 1,008 ft. WOB = 4K 4.5 ft. of good material
	Prepare to core
14:06	TIH with core barrel
16:37	Dropped the ball
16:50	Begin coring at 1,009 ft.
17:30	End coring at 1,022 ft.
17:35	TOOH with core barrel
18:00	NAJ off site
21:30	NAJ on site
21:35	Tagged top of core hole at 1009 ft.
22:18	Drilling new hole at 1022 ft.
22:19	Drilling at 1025 ft. WOB = 3-4K

22:42	Drilling at 1,040 ft. WOB = 2K soft
22:54	Drilling at 1,050 ft. WOB = 2K soft
22:58	Drilling at 1,055 ft. WOB = 3K
23:05	Drilling at 1,060 ft. WOB = 3-4K
23:19	KD at 1071 ft.
00:05	Drilling at 1080 ft. WOB = 2K
	Cuttings 90% LS-white, chalky 10% LS-gray, hard
00:21	Drilling at 1,095 ft. WOB = 2K
00:58	Drilling at 1,111 ft. WOB = 3K
	Cuttings 90% LS-tan, friable, forams and echinoids 10% LS-gray, hard
01:25	TD pilot hole at 1,125 ft. WOB = 3K
	Loggers scheduled for 07:30. Will run short wiper trip then TOOH
01:30	NAJ off site

Daily Operations Report Form

Rig Number: 242

Superintendent: [illegible]

Date: 11-20-97

Job Number: _____ Well Number: 4-27A

Lead Driller: _____

Shift: Day

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
			11½ M Flow Line
			Start Drilling Pilot hole drilled to 170'

Cement Stage Reports

Stage Number: _____ Tag: _____ Feet

Barrel Pre Flush		Barrel Flush	
Type	Barrels Lead	CuFt	Sacks
Type	Barrels Tail	CuFt	Sacks

Notes

Stage Number: _____ Tag: _____ Feet

Barrel Pre Flush		Barrel Flush	
Type	Barrels Lead	CuFt	Sacks
Type	Barrels Tail	CuFt	Sacks

Notes

Production Recap

Beginning Borehole Footage: Surface Ending Borehole Footage: 170' Reamed Size: 12¼ Footage: 170' Casing Size: _____ Footage: _____

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Time From	Time To	Total Hours	Employee Name	Empl Initials	Time From	Time To	Total Hours	Employee Name	Empl Initials
0700	1900	12	Ronnie Thomas						
0700	1900	12	Randy Richardson						
0700	1900	12	Flint - Shad						
0700	1900	12	Keegan Blasi						

Notes

Daily Operations Report Form

Job Number: _____ Well Number: NSR #1 Superintendent: Jay S. Lead Driller: _____ Rig Number: 248 Date: 11-29-97 Shift: Night

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
1900			Drilling 12¼ DH hole fm. 170'
			Drill to 730' Had pickup pump problem
			Pull up 30' & sand hung up.
			Resume Drilling to 800' & ream.
			Kill @ 227 @ 12:15 pm clean hole
			Stand #3.
			Drill to 409' Circulate hole clean.

Production Recap

Beginning Borehole Footage: 170' Ending Borehole Footage: 409 Reamed Size: 17½ Footage: 239' Casing Size: _____ Footage: _____

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Time From	Time To	Total Hours	Employee Name	Empl Initials	Time From	Time To	Total Hours	Employee Name	Empl Initials
1900	0700	12	Lance Webster	LW					
1900	0700	12	Chris Hard	CH					
1900	0700	12	Juan Dominguez	JD					
1900	0700	12	Mitchell Gordon	CG					
1900	0700	12	Adam Pinion	AP					

Cement Stage Reports

Stage Number: _____ Tag: _____ Feet

Barrel Pre Flush	Barrel Flush

Type	Barrels Lead	CuFt	Sacks
Type	**Barrels Tail**	**CuFt**	**Sacks**

Notes

Stage Number: _____ Tag: _____ Feet

Barrel Pre Flush	Barrel Flush

Type	Barrels Lead	CuFt	Sacks
Type	**Barrels Tail**	**CuFt**	**Sacks**

Notes

Daily Operations Report Form

Rig Number: 248

Superintendent: J.

Job Number: _____ Well Number: 22-1 Lead Driller: _____ Shift: D.

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
			Rig up on 7" Drilled to 47.
			Circulate hole clean.
			Make short trip circulate hole
			TOOH TIGHT
1130	1400		Run [illegible]

Production Recap

Beginning Borehole Footage: 459 Ending Borehole Footage: 470 Reamed Size: 12¼ Footage: _____ Casing Size: _____ Footage: _____

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Time From	Time To	Total Hours	Employee Name	Empl Initials	Time From	Time To	Total Hours	Employee Name	Empl Initials
0700	1900	12	Ronnie Travis						
0700	1900	12	[illegible]						
0700	1900	12	[illegible]						
0700	1900	12	Russ Travis						

Cement Stage Reports

Stage Number: _____ Tag: _____ Feet

Barrel Pre Flush	Barrel Flush

Type	Barrels Lead	CuFt	Sacks

Type	Barrels Tail	CuFt	Sacks

Notes

Stage Number: _____ Tag: _____ Feet

Barrel Pre Flush	Barrel Flush

Type	Barrels Lead	CuFt	Sacks

Type	Barrels Tail	CuFt	Sacks

Notes

Daily Operations Report Form

Job Number: _____ Well Number: ASR #1 Superintendent: Jay S Lead Driller: _____ Rig Number: 248 Date: 11-30-97 Shift: Night

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
1900			Finish Hitting in Washpipe, Dial in OK
			Pick up Stabilizer + Make up Hole opener.
			Fix rack on Ladder Forks. Fix leak in Mud Hopper
	0700		Build Volume - Keep hole full
		12	

Cement Stage Reports

Stage Number: _____ Tag: _____ Feet

Barrel Pre Flush	Barrel Flush

Type	Barrels Lead	CuFt	Sacks
Type	**Barrels Tail**	**CuFt**	**Sacks**

Notes

Stage Number: _____ Tag: _____ Feet

Barrel Pre Flush	Barrel Flush

Type	Barrels Lead	CuFt	Sacks
Type	**Barrels Tail**	**CuFt**	**Sacks**

Notes

Production Recap

Beginning Borehole Footage: 470 Ending Borehole Footage: _____ Reamed Size: 12¼ Footage: _____ Casing Size: _____ Footage: _____

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Time From	Time To	Total Hours	Employee Name	Empl Initials	Time From	Time To	Total Hours	Employee Name	Empl Initials
1900	0700	12	Cameron Webster	CW					
1900	0030	5.5	Chris Harp	CH					
1900	0030	5.5	Juan Dominguez	JD					
1900	0700	12	Adam Pitilon	AP					

Daily Operations Report Form

Job Number: _____ Well Number: ASR-1 Superintendent: J... Lead Driller: _____ Rig Number: 24K Date: 12-01-17 Shift: D...

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
			Drill 32" hole

Production Recap

Beginning Borehole Footage: 50 Ending Borehole Footage: 96' Reamed Size: 32" Footage: 32 Casing Size: _____ Footage: _____

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Time From	Time To	Total Hours	Employee Name	Empl Initials	Time From	Time To	Total Hours	Employee Name	Empl Initials
0700	1900	12	Ronnie Thom...						
0700	1900	12	Sonny Thompson						
0700	1900	12	Thomas Jo...						
0700	1900	12	Rusty Th...						

Cement Stage Reports

Stage Number: _____ Tag: _____ Feet

Barrel Pre Flush		Barrel Flush	
Type	**Barrels Lead**	**CuFt**	**Sacks**
Type	**Barrels Tail**	**CuFt**	**Sacks**

Notes

Stage Number: _____ Tag: _____ Feet

Barrel Pre Flush		Barrel Flush	
Type	**Barrels Lead**	**CuFt**	**Sacks**
Type	**Barrels Tail**	**CuFt**	**Sacks**

Notes

Daily Operations Report Form

Job Number: T3055 Well Number: ASR #1 Superintendent: [illegible] Lead Driller: [illegible] Rig Number: 203 Date: [illegible] Shift: Night

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
1900			Drilling on DC #2 - 98'
			Drill to 141'
	0700	12	Rig down

Cement Stage Reports

Stage Number: _____ Tag: _____ Feet

Barrel Pre Flush	Barrel Flush

Type	Barrels Lead	CuFt	Sacks

Type	Barrels Tail	CuFt	Sacks

Notes

Stage Number: _____ Tag: _____ Feet

Barrel Pre Flush	Barrel Flush

Type	Barrels Lead	CuFt	Sacks

Type	Barrels Tail	CuFt	Sacks

Production Recap

Beginning Borehole Footage: 98 Ending Borehole Footage: 141 Reamed Size: 37½ Footage: _____ Casing Size: _____ Footage: 43

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Time From	Time To	Total Hours	Employee Name	Empl Initials	Time From	Time To	Total Hours	Employee Name	Empl Initials
1900	0700	12	Cameron Webster	CW					
1900	0700	12	Chris Hurd	CH					
1900	0700	12	Jason Dominguez	JD					
1900	0700	12	Justin Gordon	JG					
1900	0700	12	Adam Pittman	AP					

Notes

Daily Operations Report Form

Rig Number: 242

Superintendent: J...

Time Date: 12-2-12

Job Number: 078035 Well Number: NGP1

Lead Driller: _____

Shift: D...

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
			Finished drilling 32½ hole to 207'
			circ hole and ...

Cement Stage Reports

Stage Number: _____ Tag: _____ Feet

Barrel Pre Flush		Barrel Flush	
Type	**Barrels Lead**	**CuFt**	**Sacks**
Type	**Barrels Tail**	**CuFt**	**Sacks**

Notes

Production Recap

Beginning Borehole Footage: _____ Ending Borehole Footage: 207' Reamed Size: 32½ Footage: _____ Casing Size: _____ Footage: _____

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Stage Number: _____ Tag: _____ Feet

Barrel Pre Flush		Barrel Flush	
Type	**Barrels Lead**	**CuFt**	**Sacks**
Type	**Barrels Tail**	**CuFt**	**Sacks**

Time From	Time To	Total Hours	Employee Name	Empl Initials	Time From	Time To	Total Hours	Employee Name	Empl Initials
0700	1900	12	Rocco T...						
0700	1900	12	Jason Bo...						
0700	K00	12	Phillip S...						
	1400	12	Russ S...						

Notes

Daily Operations Report Form

Job Number: 978035 Well Number: ASR #1 Superintendent: Jim Rig Number: 542

Lead Driller: _____ Date: 12-2-17 Shift: Night

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
1900			TD @ 207 Circulating hole
			Pull out of hole rack back collars + circ back to bottom
			w/DD + stabilizer
			Mix sweep + circ hole clean work pipe on + hole
			TOOH + LD DD stabilizer pull 1 jt to 5" csg
			Lower Logger here 3" in hole @ 4:30 - 1
			start running pipe @ 5:22
	0700	12	Released rig @ 7 running.

Cement Stage Reports

Stage Number: _____ Tag: _____ Feet

Barrel Pre Flush	Barrel Flush

Type	Barrels Lead	CuFt	Sacks
Type	**Barrels Tail**	**CuFt**	**Sacks**

Notes

Stage Number: _____ Tag: _____ Feet

Barrel Pre Flush	Barrel Flush

Type	Barrels Lead	CuFt	Sacks
Type	**Barrels Tail**	**CuFt**	**Sacks**

Notes

Production Recap

Beginning Borehole Footage: _____ Ending Borehole Footage: _____ Reamed Size: _____ Footage: _____ Casing Size: _____ Footage: _____

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Time From	Time To	Total Hours	Employee Name	Empl Initials	Time From	Time To	Total Hours	Employee Name	Empl Initials
1900	0700	12	Cameron Webster	CW					
1900	0700	12	Chris Harp	CH					
1900	0700	12	Jean Dominguez	JD					
1900	0700	12	Kristell Gordon	CG					
1900	0700	12	Adam Pitilon	AP					

Daily Operations Report Form

Job Number: 072-35 Well Number: A-27 1

Superintendent: Jo

Lead Driller:

Rig Number: 242

Date: 1-2-12

Shift: D

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
			Finished running 4½
			FT w/ 7⅞ Mill
			Rig Pump & Lines Down
			TT out of
			Tag cmt @ 1,[illegible]
			DT bail &

Production Recap

Beginning Borehole Footage: _____ Ending Borehole Footage: _____ Reamed Size: _____ Footage: _____ Casing Size: _____ Footage: _____

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Time From	Time To	Total Hours	Employee Name	Empl Initials	Time From	Time To	Total Hours	Employee Name	Empl Initials
0700	1900	12	Paul Thomas						
0700	1900	12	[illegible]						
0700	1900	12	Phillip Shad						
0700	1900	12	Dan Hall						

Cement Stage Reports

Stage Number: _____ Tag: _____ Feet

Barrel Pre Flush	Barrel Flush

Type	Barrels Lead	CuFt	Sacks

Type	Barrels Tail	CuFt	Sacks

Notes

Stage Number: _____ Tag: _____ Feet

Barrel Pre Flush	Barrel Flush

Type	Barrels Lead	CuFt	Sacks

Type	Barrels Tail	CuFt	Sacks

Notes

Daily Operations Report Form

Rig Number: 242

Job Number: 978055 Well Number: ASR #1 Superintendent: Jay Lead Driller: _____ Date: 12-3-07 Shift: Night

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
1900			Service rig. Finish rdlg mast bar - start in the line
			to casing, move lead pumps. Pull tubing. Change out shaker
			screen. Change Filter #20. Change oil in Rig motor. Make up
			Bit + TIH. Make up Hoader. Break Circ 2130
			Tag @ 196' start drilling 12¼ hole w/ Mud #2
	0700	12	Drill to 471' Relieved.
			Mud wt Vis
			8.7 38

Production Recap

Beginning Borehole Footage: 196 Ending Borehole Footage: 471' Reamed Size: 12¼ Footage: 275' Casing Size: 26 Footage: 201

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Time From	Time To	Total Hours	Employee Name	Empl Initials	Time From	Time To	Total Hours	Employee Name	Empl Initials
1900	0700	12	Cameron Webster	CW	1400	2230		Gary Wall	
1900	0700	12	Chris Hard						
1900	0700	12	Sean Dominguez	=D					
1900	0700	12	Adam Pitlen						
1900	0700	12	Crystal Gordon						

Cement Stage Reports

Stage Number: _____ Tag: _____ Feet

Barrel Pre Flush	Barrel Flush

Type	Barrels Lead	CuFt	Sacks

Type	Barrels Tail	CuFt	Sacks

Notes

Stage Number: _____ Tag: _____ Feet

Barrel Pre Flush	Barrel Flush

Type	Barrels Lead	CuFt	Sacks

Type	Barrels Tail	CuFt	Sacks

Notes

Daily Operations Report Form

Rig Number: 240

Superintendent: Jo

Date: 12-4-97

Job Number: 97836 Well Number: Ayer #1 Lead Driller: _____ Shift: Day

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
			Make [illegible] #7 Drilling From 491' to [illegible]
			[illegible]
			[illegible]
			[illegible]
			[illegible]
			[illegible]
			[illegible]
			Rig up and #10 Duct to 900'

Cement Stage Reports

Stage Number: _____ Tag: _____ Feet

Barrel Pre Flush	Barrel Flush

Type	Barrels Lead	CuFt	Sacks

Type	Barrels Tail	CuFt	Sacks

Notes

Stage Number: _____ Tag: _____ Feet

Barrel Pre Flush	Barrel Flush

Type	Barrels Lead	CuFt	Sacks

Type	Barrels Tail	CuFt	Sacks

Notes

Production Recap

Beginning Borehole Footage: 491' Ending Borehole Footage: 900' Reamed Size: _____ Footage: _____ Casing Size: _____ Footage: 2nd

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Time From	Time To	Total Hours	Employee Name	Empl Initials	Time From	Time To	Total Hours	Employee Name	Empl Initials
[illegible]	1900	12	Ronnie Thomas						
0700	1900	12	Sonny Dunmire						
0700	1900	12	[illegible]						
0700	1900	12	[illegible]						

Daily Operations Report Form

Job Number: 978035 Well Number: ASR # 1 Superintendent: Jay S Lead Driller: _____

Rig Number: 248 Date: 12-4-97 Shift: Days

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
0700			Circulate to bottom cond. mud
			TOOH w/ 12¼ bit
			TIH w/ core barrel flowed off
			TOOH w/ same
			TIH w/ 12¼ bit plug bit
	1900	12	TOOH w/ same plugged out bit

Production Recap

Beginning Borehole Footage: _____ Ending Borehole Footage: _____ Reamed Size: _____ Footage: _____ Casing Size: _____ Footage: _____

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Time From	Time To	Total Hours	Employee Name	Empl Initials	Time From	Time To	Total Hours	Employee Name	Empl Initials
0700	1900	12	Konnie Thames						
0700	1900	12	Sonny Roopnarine						
0700	1900	12	Philip Shand						
0700	1900	12	Reeza Ilyavi						

Cement Stage Reports

Stage Number: _____ Tag: _____ Feet

Barrel Pre Flush	Barrel Flush		
Type	**Barrels Lead**	**CuFt**	**Sacks**
Type	**Barrels Tail**	**CuFt**	**Sacks**

Notes

Stage Number: _____ Tag: _____ Feet

Barrel Pre Flush	Barrel Flush		
Type	**Barrels Lead**	**CuFt**	**Sacks**
Type	**Barrels Tail**	**CuFt**	**Sacks**

Notes

Daily Operations Report Form

Job Number: 978035 Well Number: ASR #1 Superintendent: Jay S Lead Driller:

Rig Number: 248 Date: 12-4-97 Shift: Nights

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
1900			Service up, Circulating @ 900'
			Drill to 949' core depth Circulate clean
			Make up core barrel
			TOOH Drag on way up Trip into casing then
			go back to bottom, change out rubbers + circulate
			last 180' to bottom, Bit plugged TOOH, Clear out Bit
			+ TIH start circulating Last 120' down
	0700	12	

Production Recap

Beginning Borehole Footage: 900' Ending Borehole Footage: Reamed Size: 12¼ Footage: Casing Size: 26" Footage: 201

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Time From	Time To	Total Hours	Employee Name	Empl Initials	Time From	Time To	Total Hours	Employee Name	Empl Initials
1900	0700	12	Cameron Webster	CW					
1900	0700	12	Chris Harp	CH					
1900	0700	12	Costell Gordon	CG					
1900	0700	12	Adam Pitilon	AP					

Cement Stage Reports

Stage Number: Tag: Feet

Barrel Pre Flush	Barrel Flush

Type	Barrels Lead	CuFt	Sacks
Type	**Barrels Tail**	**CuFt**	**Sacks**

Notes

Stage Number: Tag: Feet

Barrel Pre Flush	Barrel Flush

Type	Barrels Lead	CuFt	Sacks
Type	**Barrels Tail**	**CuFt**	**Sacks**

Notes

Daily Operations Report Form

Job Number: 978035 Well Number: ASR # 1 Superintendent: Jay S. Lead Driller:

Rig Number: 248 Date: 12-5-97 Shift: Nights

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
1900			Make up bit + Trip in collars + rubbers
			to seal well. Empty mud pits cut + clean trash
			R+R Kelly Hose + pump clean.
			Mix up 60 Vis + begin to ream to bottom
			20' Fill on bottom @ 5 30 Circulate till clean pick
			up 30' + Mix 100 sweep Go back to bottom
			45 Vis
			9.0 WT

Production Recap

Beginning Borehole Footage: 949 Ending Borehole Footage: Reamed Size: 12¼ Footage: Casing Size: 2½" Footage: 701

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Time From	Time To	Total Hours	Employee Name	Empl Initials	Time From	Time To	Total Hours	Employee Name	Empl Initials
1900	0700	12	Cameron Webster	CW					
1900	0700	12	Chris Harp	CH					
1900	0700	12	Adam Pitilon	AP					

Cement Stage Reports

Stage Number: Tag: Feet

Barrel Pre Flush	Barrel Flush

Type	Barrels Lead	CuFt	Sacks
Type	**Barrels Tail**	**CuFt**	**Sacks**

Notes

Stage Number: Tag: Feet

Barrel Pre Flush	Barrel Flush

Type	Barrels Lead	CuFt	Sacks
Type	**Barrels Tail**	**CuFt**	**Sacks**

Notes

Daily Operations Report Form

Job Number: 978035 Well Number: ASR#1 Superintendent: Jay Lead Driller:

Rig Number: 248 Date: 12-6-97 Shift: Day

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
			Circ hole raise mud
			TOOH w/12¼ bit
			Start in hole w/core barrel Plugged off
			TOOH w/core
			Cleaned out pump & all lines w/Fresh water
			TIH w/core barrel circ each stand down tagged @ 949'
			Cored to 959'
			TOOH w/core

Production Recap

Beginning Borehole Footage: _____ Ending Borehole Footage: _____ Reamed Size: _____ Footage: _____ Casing Size: _____ Footage: _____

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Time From	Time To	Total Hours	Employee Name	Empl Initials	Time From	Time To	Total Hours	Employee Name	Empl Initials
0700	1900	12	Ronnie Thomas						
0700	1900	12	Sonny Rodriguez						
0700	1900	12	Phillip Shield						
0700	1900	12	Randy Tibaut						
0700	1900	12	Woodie Stewart						

Cement Stage Reports

Stage Number: _____ Tag: _____ Feet

Barrel Pre Flush	Barrel Flush

Type	Barrels Lead	CuFt	Sacks

Type	Barrels Tail	CuFt	Sacks

Notes

Stage Number: _____ Tag: _____ Feet

Barrel Pre Flush	Barrel Flush

Type	Barrels Lead	CuFt	Sacks

Type	Barrels Tail	CuFt	Sacks

Notes

Daily Operations Report Form

Job Number: 978035 Well Number: ASR #1 Superintendent: Jay S. Lead Driller: _____ Rig Number: 248 Date: 12-6-97 Shift: Night

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
1900			Service up. Break down core barrel + Put back together
			Trip in 12¼ circulating all the way to bottom
			Tag @ 949 Top of corehole. Make conn DP #15
			Clean out corehole + drill to 974' Next core depth
			Circulate clean + TOOH Pick up core barrell
			Circulate to bottom w/ barrell on Bottom' 5:45
			Core 974 - 987

Production Recap

Beginning Borehole Footage: 949 Ending Borehole Footage: _____ Reamed Size: _____ Footage: _____ Casing Size: 26" Footage: 201

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Time From	Time To	Total Hours	Employee Name	Empl Initials	Time From	Time To	Total Hours	Employee Name	Empl Initials
1900	0700	12	Cameron Webster	CW					
1900	0700	12	Chris Harp	CH					
1900	0700	12	Juan Dominguez	JD					
1900	0700	12	Costell Gordon	CG					
1900	0700	12	Adam Pitilon	AP					

Cement Stage Reports

Stage Number: _____ Tag: _____ Feet

Barrel Pre Flush	Barrel Flush		
Type	**Barrels Lead**	**CuFt**	**Sacks**
Type	**Barrels Tail**	**CuFt**	**Sacks**

Notes

Stage Number: _____ Tag: _____ Feet

Barrel Pre Flush	Barrel Flush		
Type	**Barrels Lead**	**CuFt**	**Sacks**
Type	**Barrels Tail**	**CuFt**	**Sacks**

Notes

Daily Operations Report Form

Job Number: 978035 Well Number: MSP#1 Superintendent: Jay Lead Driller:

Rig Number: 249 Saw Date: 12-7-97 Shift: Day

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
			TOOH W/core barrell Laid down same
			TIH W/12¼ bit tagged @ 974'
			clean out core hole F/974 to 987'
			Drilled new hole F/987 to 1008' circ. hole clean
			TOOH W 12¼" bit
			Picked up core barrell circ. reach stand down Picked up 2 its 5" drill pipe
			Core F/1008 to 1021 13'
			TOOH W/core Barrell Removed 9'
			Total 17 stands D.P.

Production Recap

Beginning Borehole Footage: 974' Ending Borehole Footage: Reamed Size: 12¼ Footage: Casing Size: 26" Footage: 201'

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Time From	Time To	Total Hours	Employee Name	Empl Initials	Time From	Time To	Total Hours	Employee Name	Empl Initials
0700	1900	12	Ronnie Thames						
0700	1900	12	Sonny Rodriguez						
0700	1900	12	Phillip Shaw						
0700	1900	12	Reza Ilyasi						
0700	1900	12	Dannie Stewart						

Cement Stage Reports

Stage Number: Tag: Feet

Barrel Pre Flush	Barrel Flush

Type	Barrels Lead	CuFt	Sacks

Type	Barrels Tail	CuFt	Sacks

Notes

Stage Number: Tag: Feet

Barrel Pre Flush	Barrel Flush

Type	Barrels Lead	CuFt	Sacks

Type	Barrels Tail	CuFt	Sacks

Notes

Daily Operations Report Form

Job Number: 978036 Well Number: ASR #1 Superintendent: Jay S Lead Driller: _____ Rig Number: 248 Date: 12-7-97 Shift: Night

Time From	Time To	Total Hours	Details of Operations in Sequence and Remarks
1900			Service WD. Rodress core barrel + lay down.
			11H w/ 12¼ Tag @ 1009' Drill out corehole + start
			new hole @ 1021', KM @ 1071 Run Survey Make conn DP
			#17 Drill to 1125' TD @ 1:25 AM Circulate hole clean
			+ condition Mud. Short trip 6 stands no fill or drag
			Circulate till 5 30 Then TOOH w/ 12¼ to rig
			up loggers.
		*	22" Fuel WT 8.8 Vis 44.

Production Recap

Beginning Borehole Footage: 1008 Ending Borehole Footage: 1125' Reamed Size: 12¼ Footage: 117' Casing Size: 26" Footage: 201

Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours	Bit #	Size	Type	Serial Number	In	Out	Footage	Cum. Hours

Time From	Time To	Total Hours	Employee Name	Empl Initials	Time From	Time To	Total Hours	Employee Name	Empl Initials
1900	0700	12	Cameron Webster	CW					
1900	0700	12	Juan Dominguez	JD					
1900	0700	12	Chris Harp	CH					
1900	0400	5	Costell Gordon	CG					
1900	0700	12	Adam Pitlin	AP					

Cement Stage Reports

Stage Number: _____ Tag: _____ Feet

Barrel Pre Flush	Barrel Flush

Type	Barrels Lead	CuFt	Sacks

Type	Barrels Tail	CuFt	Sacks

Notes

Stage Number: _____ Tag: _____ Feet

Barrel Pre Flush	Barrel Flush

Type	Barrels Lead	CuFt	Sacks

Type	Barrels Tail	CuFt	Sacks

Notes

LITHOLOGIC DESCRIPTION

Date :12-10-97
Contractor : Youngquist Brothers.
Location : 5-ASH ASR
Well : ASR-1

0'-30' Sand 100%, white to light tan and brown, coarse grained, well rounded and well sorted, unimodal, quarts based with trace lithics-heavies-and feldspar. Sand is mostly clean but has been mixed with drilling mud and fill material.

30'-60' Sand 100%, white to light tan, fine grained, well rounded and well sorted, unimodal, quarts based with trace lithics-heavies-and feldspar. Sand is mostly clean.

60'-90' Limestone 75%, medium to light gray, wackestone - packstone, contains carbonate sand- quarts sand, recrystalized (clear tan rhombs), well cemented, intergranular porosity is present. Rock is recrystalized calcite. Contains fragments of plecypoda, and gastropoda.

Sand 25%, white to light tan and brown, fine grained, well rounded and well sorted, unimodal, quarts based with trace lithics-heavies-and feldspar. Sand is mostly clean.

90'-170' Limestone 65%, light gray to white, fine grained wackestone - packstone, contains carbonate sand- abundant bioclast fragments- and trace quarts and lithics, poorly cemented, porosity is present.

Sand 30%, white to light tan, fine grained, well rounded and well sorted, unimodal, quarts based with trace lithics-heavies-and feldspar. Sand is mostly clean but has been mixed with drilling mud.

Shell 5%, tan opaque, recrystalized and low Mg calcite constituents, some are etched, breakage is common (possibly secondary), hash like in zones. Fossils including gastropods and plecypods.

170'-200 Limestone 95%, medium to light gray, wackestone-packstone, contains carbonate sand- quarts sand, recrystalized (clear tan rhombs), well cemented, intergranular and moldic porosity is present. Rock is recrystalized calcite. Contains fragments of plecypoda, and gastropoda.

Sand 5%, white to light tan and brown, fine grained, well rounded and well sorted, unimodal, quarts based with trace lithics-heavies-and feldspar. Sand is mostly clean.

200-250 Limestone, 95%, medium to dark gray, wackestone to recrystalized packstone, contains carbonate sand- bioclasts- and trace quarts and lithics, possible Mn, recrystalized (clear tan rhombus, can make up as much as 25% of total volume), cemented with abundant pore filling calcite spar cement (white),moderately cemented, porosity is

Sand 5%, white to light tan and brown, fine grained, well rounded and well sorted, unimodal, quarts based with trace lithics-heavies-and feldspar. Sand is mostly clean.

250-270 Limestone, 85%, medium to dark gray, wackestone to sandy packstone, contains carbonate sand- bioclasts- and trace quarts and lithics, possible Mn, recrystalized (clear tan rhombus, can make up as much as 25% of total volume), cemented with abundant pore filling calcite spar cement (white),moderately cemented, porosity is

Sand 5%, white to light tan and brown, fine grained, well rounded and well sorted, unimodal, quarts based with trace lithics-heavies-and feldspar. Sand is mostly clean.

Shell 10%, tan opaque, recrystalized and low Mg calcite constituents, some are etched, breakage is common (possibly secondary), hash like in zones. Fossils including gastropods and plecypods.

270-310 Limestone, 65%, medium gray to light green, wackestone, contains carbonate sand- bioclasts- and trace quarts and lithics, possible Mn, recrystalized (clear tan rhombus, can make up as much as 25% of total volume), cemented with abundant pore filling calcite spar cement (white),moderately cemented, porosity is

Yellowish gray to olive clay, 20%, The clay is plastic, and interbedded with minor light olive gray to white limestone. The clay contains quartz sand, silt, and minor plecypoda material, and calcite and dolomite cement. Contains isolated occurrences of plecypods. Clay is dominantly montmorillonite.

Sand 5%, white to light tan and brown, fine grained, well rounded and well sorted, unimodal, quarts based with trace lithics-heavies-and feldspar. Sand is mostly clean.

Shell 5%, tan opaque, recrystalized and low Mg calcite constituents, some are etched, breakage is common (possibly secondary), hash like in zones. Fossils including gastropods and plecypods.

310-350 Clay, 90%, Yellowish gray to olive ,The clay is nodular,and interbedded with minor light olive gray to white limestone. The clay contains quartz sand, silt, and minor plecypoda material, and calcite and dolomite cement. Contains isolated occurrences of plecypods. Clay is dominantly montmorillonite.

Limestone 10%, light gray to white, fine grained wackestone - packstone, contains carbonate sand- abundant bioclast fragments- and trace quarts and lithics, poorly cemented, porosity is present.

350-425 Clay, 95%, Yellowish gray to olive ,The clay is nodular,and interbedded with minor light olive gray to white limestone. The clay contains quartz sand, silt, and minor plecypoda material, and calcite and dolomite cement. Contains isolated occurrences of plecypods. Clay is dominantly montmorillonite.

Shell 5%, tan opaque, recrystalized and low Mg calcite constituents, some are etched, breakage is common (possibly secondary), hash like in zones. Fossils including gastropods and plecypods.

425-450 Clay, 100%, light green to dark olive, the clay is plastic, and is interbedded with minor amounts of light olive gray to white limestone. The clay contains quartz sand, silt, and minor plecypoda material (fragmented), and calcite and dolomite cement. Porosity and, permeability are absent due to plastic nature of clay.

450-470 Limestone, 65%, medium gray to light green, wackestone, contains carbonate sand-bioclasts- and trace quarts and lithics, possible Mn, recrystalized (clear tan rhombus, can make up as much as 25% of total volume), cemented with abundant pore filling calcite spar cement (white),moderately cemented, porosity is

Yellowish gray to olive clay, 20%, The clay is plastic, and interbedded with minor light olive gray to white limestone. The clay contains quartz sand, silt, and minorplecypoda material, and calcite and dolomite cement. Contains isolated occurrences of plecypods. Clay is dominantly montmorillonite.

Sand 5%, white to light tan and brown, fine grained, well rounded and well sorted, unimodal, quarts based with trace lithics-heavies-and feldspar. Sand is mostly clean.

Shell 5%, tan opaque, recrystalized and low Mg calcite constituents, some are etched, breakage is common (possibly secondary), hash like in zones. Fossils including gastropods and plecypods.

470-550 Clay, 100%, dark olive, the clay is plastic, and is interbedded with minor amounts of light olive gray to white limestone. The clay contains quartz sand, silt, and minor plecypoda material (fragmented), and calcite and dolomite cement. Porosity and, permeability are absent due to plastic nature of clay.

550-555 Limestone100% Complexly interbedded, argillaceous limestone. Limestone is generally light gray to white, poor to moderately indurated, mudstones and wackestones. Porosity is low.Grains include minor fossil debris, and peloids.

555-690 Clay, 100%, light green to gray, the clay is plastic, and is interbedded with minor amounts of light olive gray to white limestone. The clay contains quartz sand, silt, and minor plecypoda material (fragmented), and calcite and dolomite cement. Porosity and, permeability are absent due to plastic nature of clay.

690-720 Limestone90% Complexly interbedded, argillaceous limestone. Limestone is generally light gray to white, poor to moderately indurated, mudstones and wackestones. Porosity is low.Grains include minor fossil debris, and peloids.

Clay, 10%, light green to gray, the clay is plastic, and is interbedded with minor amounts of light olive gray to white limestone. The clay contains quartz sand, silt, and minor

plecypoda material (fragmented), and calcite and dolomite cement. Porosity and, permeability are absent due to plastic nature of clay.

720-910 Clay, 90%, light green to gray, the clay is plastic, and is interbedded with minor amounts of light olive gray to white limestone. The clay contains quartz sand, silt, and minor plecypoda material (fragmented), and calcite and dolomite cement. Porosity and, permeability are absent due to plastic nature of clay.

Limestone10% Complexly interbedded, argillaceous limestone. Limestone is generally light gray to white, poor to moderately indurated, mudstones and wackestones. Porosity is low.Grains include minor fossil debris, and peloids.

910-970 Clay, 20%, light green to gray, the clay is plastic, and is interbedded with minor amounts of light olive gray to white limestone. The clay contains quartz sand, silt, and minor plecypoda material (fragmented), and calcite and dolomite cement. Porosity and, permeability are absent due to plastic nature of clay.

Limestone80% Complexly interbedded, argillaceous limestone. Limestone is generally medium gray to white, poor to moderately indurated, mudstones and wackestones. Porosity is low.Grains include minor fossil debris, and peloids, abundant phosphate is present.

970-1030 Limestone, 90% white to medium gray, moderately indurated boundstones to wackstones,locally grades to packstone and grainstone. Contains phosphate nodules. Some bioclasts are represented as moldic porosity, and high secondary porosity and permeability are present (intergranular, interparticle and moldic). Locally the rock is recrystalized. Well indurated, and contains
coarse spar cement (reducing). Biotics include reef fauna assemblage (diverse mollusk, foram, bryozoan, corals).

Clay, 10%, light green to gray, the clay is plastic, and is interbedded with minor amounts of light olive gray to white limestone. The clay contains quartz sand, silt, and minor plecypoda material (fragmented), and calcite and dolomite cement. Porosity and, permeability are absent due to plastic nature of clay.

1030-1050 Limestone, 80%, Moderately soft, highly fossiliferous, very pale orange to tan, pelletal, wackestones, and packstones, with 5% to 10% intergranular porosity. Locally, the unit is composed of thin layers of very hard micrite, of low porosity and permeability. Abundant foraminifera, and echinoids.

Clay, 20%, light green to gray, the clay is plastic, and is interbedded with minor amounts of light olive gray to white limestone. The clay contains quartz sand, silt, and minor plecypoda material (fragmented), and calcite and dolomite cement. Porosity and, permeability are absent due to plastic nature of clay.

1050-1125 Limestone, 80%, Moderately soft, highly fossiliferous, very pale orange to tan, pelletal, wackestones, and packstones, with 15% to 40% intergranular porosity. Locally, the unit is composed of thin layers of very hard micrite, of low porosity and permeability. Abundant foraminifera, and echinoids.

MONTGOMERY WATSON

WELL # ASR-1 CORE DESCRIPTION

DATE(S): 12/6/97

CITY OF FORT LAUDERDALE - FIVEASH WTP ASR WELL

JOB NUMBER 1324007
COST CODE 28090290

CONTRACTOR: Youngquist

TOTAL DEPTH:	959	feet
COUNTY:	Broward	
OWNER:	City of Fort Lauderdale	
DRILLING METHOD:	Carbide Aggressive Drilling	
DRILLER(S):	Ronnie Thames	
DATUM POINT:	Pad level	
DATUM POINT ELEVATION:	8.0 NGVD	
HYDROLOGIC UNITS:	Upper Floridan	
% RECOVERY	10 %	
CORED INTERVAL	949 - 959	

DEPTH (feet below pad)			DEPTH INTERVAL	DESCRIPTION	DRILLING COMMENTS
949	to	950	1	Limestone, argillaceous , Limestone is medium gray to white, poor to moderately indurated, succrosic mudstones and wackestones. Porosity is inter-granular and low. Grains include trace fossil debris, and peloids, abundant phosphate is present.	Penetration rate = 2 minute/foot. Weight on bit = 2 K. RPM of kelly = 30. Pump pressure held at a constant of 65 psi.
950	to	959	9	NO RECOVERY	Penetration rate = 30 seconds/foot. Weight on bit = 0 K. RPM of kelly = 30. Pump pressure held at a constant of 85 psi.

Description by M.R.S

MONTGOMERY WATSON

WELL # ASR-1 CORE DESCRIPTION

DATE(S): 12/7/97

CITY OF FORT LAUDERDALE - FIVEASH WTP ASR WELL

JOB NUMBER 1324007
COST CODE 28090290

CONTRACTOR: Youngquist

TOTAL DEPTH:	986	feet
COUNTY:	Broward	
OWNER:	City of Fort Lauderdale	
DRILLING METHOD:	Carbide Aggressive Drilling	
DRILLER(S):	Ronnie Thames	
DATUM POINT:	Pad level	
DATUM POINT ELEVATION:	8.0 NGVD	
HYDROLOGIC UNITS:	Upper Floridan	
% RECOVERY	10 %	
CORED INTERVAL	974 - 986	

DEPTH (feet below pad)			DEPTH INTERVAL	DESCRIPTION	DRILLING COMMENTS
974	to	975	1	Limestone, limestone is light gray to white, well indurated, mudstone to wackestone. Porosity is inter-granular and moldic. Permeability is low. Grains include fossil debris, and peloids, minor phosphate is present.	Penetration rate = 5 minute/foot. Weight on bit = 2 K. RPM of kelly = 30. Pump pressure held at a constant of 70 psi.
975	to	986	9	NO RECOVERY	Penetration rate = 30 seconds/foot. Weight on bit = 0 K. RPM of kelly = 30. Pump pressure held at a constant of 85 psi.

Description by M.R.S

MONTGOMERY WATSON

WELL # ASR-1 CORE DESCRIPTION

DATE(S): 12/8/97

CITY OF FORT LAUDERDALE - FIVEASH WTP ASR WELL

JOB NUMBER 1324007
COST CODE 28090290

CONTRACTOR: Youngquist

TOTAL DEPTH:	1022	feet
COUNTY:	Broward	
OWNER:	City of Fort Lauderdale	
DRILLING METHOD:	Carbide Aggressive Drilling	
DRILLER(S):	Ronnie Thames	
DATUM POINT:	Pad level	
DATUM POINT ELEVATION:	8.0 NGVD	
HYDROLOGIC UNITS:	Upper Floridan	
% RECOVERY	85 %	
CORED INTERVAL	1008 - 1022	

DEPTH (feet below pad)			DEPTH INTERVAL	DESCRIPTION	DRILLING COMMENTS
1008	to	1017	8	Limestone, white to medium gray, moderately indurated boundstones to wackstones, locally grades to packstone and grainstone. Contains phosphate nodules. Some bioclasts are represented as moldic porosity, and high secondary porosity and permeability are present (intergranular, interparticle and moldic). Locally the rock is recrystalized. Well indurated, and contains coarse spar cement (reducing). Biotics include reef fauna assemblage (diverse mollusk, foram, bryozoan, corals).	Penetration rate = 5 minute/foot. Weight on bit = 2-4 K. RPM of kelly = 30. Pump pressure held at a constant of 70 psi.
1017	to	1022	5	NO RECOVERY	Penetration rate = 30 seconds/foot. Weight on bit = 0 K. RPM of kelly = 30. Pump pressure held at a constant of 85 psi.

Description by M.R.S

FLORIDA
GEOPHYSICAL LOGGING, INC.

XY CALIPER
GAMMA RAY
LOG

Company MONTGOMERY WATSON
Well ASR-1
Field FIVE ASH WWTP
Country BROWARD
State/Prv FLORIDA

Company MONTGOMERY WATSON
Well ASR-1
Field FIVE ASH WWTP
Country BROWARD
State/Prv FLORIDA
Location
Other Services NONE
Elevation
K.B.
D.F.
G.L.
Elevation PAD

Log Measured From PAD
Drilling Measured From PAD

Run Number TWO
Date Logged 12/3/97
Depth Logger SURFACE
Bottom Logged Interval 850'
Top Log Interval SURFACE
Open Hole Size 20"
Density / Viscosity N/A
PH / Fluid Loss N/A
Source Strength N/A
Rm @ Measured Temp N/A
Rmf @ Measured Temp N/A
Rmc @ Measured Temp N/A
Source Rmf / Rmc N/A
Rm @ BHT N/A
Time Logger on Bottom 0400
Unit Number 5
Location FT. MYERS
Recorded By K.LEE
Witnessed By M.DONNELLY

Casing Record

	Size	Weight	Top	Bottom
Surface String	20"			
Production String				
Liner				

Tubing Record

	Size	Weight	From	To
Tubing				

Bit Record

Run Number	Bit Size	From	To
TWO	12.25"	SURF	20"

<<< 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

FLORIDA
GEOPHYSICAL LOGGING, INC.

MAIN PASS

Database File: feasr1.db
Dataset Pathname: pass4
Presentation Format: gryxc.prs
Dataset Creation Date: Wed Dec 03 04:51:38 1997
Charted by: Depth in Feet scaled 1:240

0 Gamma Ray (GAPI) 100
30 Y Caliper (in) 50
30 X Caliper (in) 50
30 BIT SIZE (in) 50

BIT SIZE
ANNULAR BOREHOLE VOLUME
TOTAL BOREHOLE VOLUME
Gamma Ray
X Caliper
Y Caliper

1006 50 414
650 100 252
364 150 141
51 200 12

0 Gamma Ray (GAPI) 100
30 Y Caliper (in) 50
30 X Caliper (in) 50
30 BIT SIZE (in) 50

FLORIDA
GEOPHYSICAL LOGGING, INC.

REPEAT PASS

Database File: feasr1.db
Dataset Pathname: pass3
Presentation Format: gryxc.prs
Dataset Creation Date: Wed Dec 03 04:40:57 1997
Charted by: Depth in Feet scaled 1:240

0 Gamma Ray (GAPI) 100
30 Y Caliper (in) 50
30 X Caliper (in) 50
30 BIT SIZE (in) 50

408 50 217
153 100 57

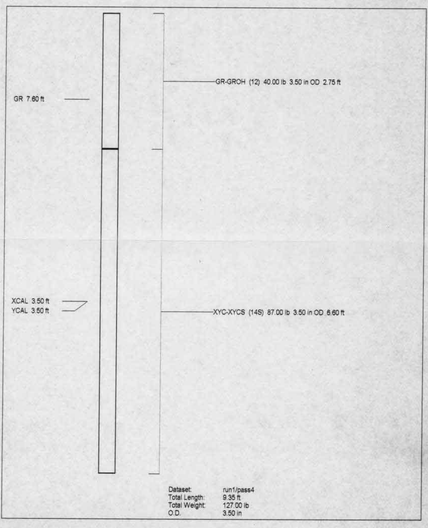
0 Gamma Ray (GAPI) 100
30 Y Caliper (in) 50
30 X Caliper (in) 50
30 BIT SIZE (in) 50

XY Caliper Calibration Report

Serial Number:	148	
Tool Model:	XYCS	
Performed:	Wed Dec 03 04:21:19 1997	
Small Ring:	20	in
Large Ring:	57	in
	X Caliper	Y Caliper
Reading with Small Ring:	533.834	487.187 cps
Reading with Large Ring:	1051.55	959.059 cps
Gain:	0.0714399	0.0784111
Offset:	-18.1227	-18.2009

Gamma Ray Calibration Report

Serial Number:	12	
Tool Model:	GROH	
Performed:	Thu Jul 10 12:33:33 1997	
Calibrator Value:	100	GAPI
Background Reading:	0	cps
Calibrator Reading:	99.0549	cps
Sensitivity:	1.00954	GAPI/cps



FLORIDA GEOPHYSICAL LOGGING, INC.

DUAL INDUCTION
LL3/SP/GR
LOG

FILE NO. _____

COMPANY CITY OF FT.LAUDERDALE W.T.P.
WELL ASR #1
FIELD FIVEASH
COUNTY BROWARD STATE FLORIDA

LOCATION

SEC. _____ TWP _____ RGE _____

OTHER SERVICES:
X-Y CALIPER
GAMMA RAY

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	30-NOVEMBER-1997	
RUN NO.	ONE	
TYPE LOG	DIL/LL3/SP/GR	
DEPTH-DRILLER	470'	
DEPTH-LOGGER	470'	
LOGGED INTERVAL	470' TO SURFACE	TO
OPERATING RIG TIME	1.5 HOURS	
TYPE FLUID IN HOLE	WATER	
SALINITY, PPM CL	NA	
DENSITY-VISCOSITY	NA	
LEVEL	FULL	
MAX. REC. TEMP. DEG F.	NA	
EQUIPMENT-LOCATION	102 FTM	
RECORDED BY	LEE	
WITNESSED BY	N.JOHNSON	

BOREHOLE RECORD				CASING RECORD			
RUN NO.	BIT	FROM	TO	SIZE	WGT.	FROM	TO
ONE	12 1/4"	470'	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.

-- TOTAL TOOL STRING LENGTH = 27 FT. --

-- GAMMA RAY -- 3 FT. LONG
MEASURE POINT 25.5 FT. FROM BOT

-- DUAL INDUCTION/LATERLOG3
24 FT LONG

-- SP MEASURE POINT --16.3 FT. FROM BOT
-- ILD MEASURE POINT --16.3 FT. FROM BOT

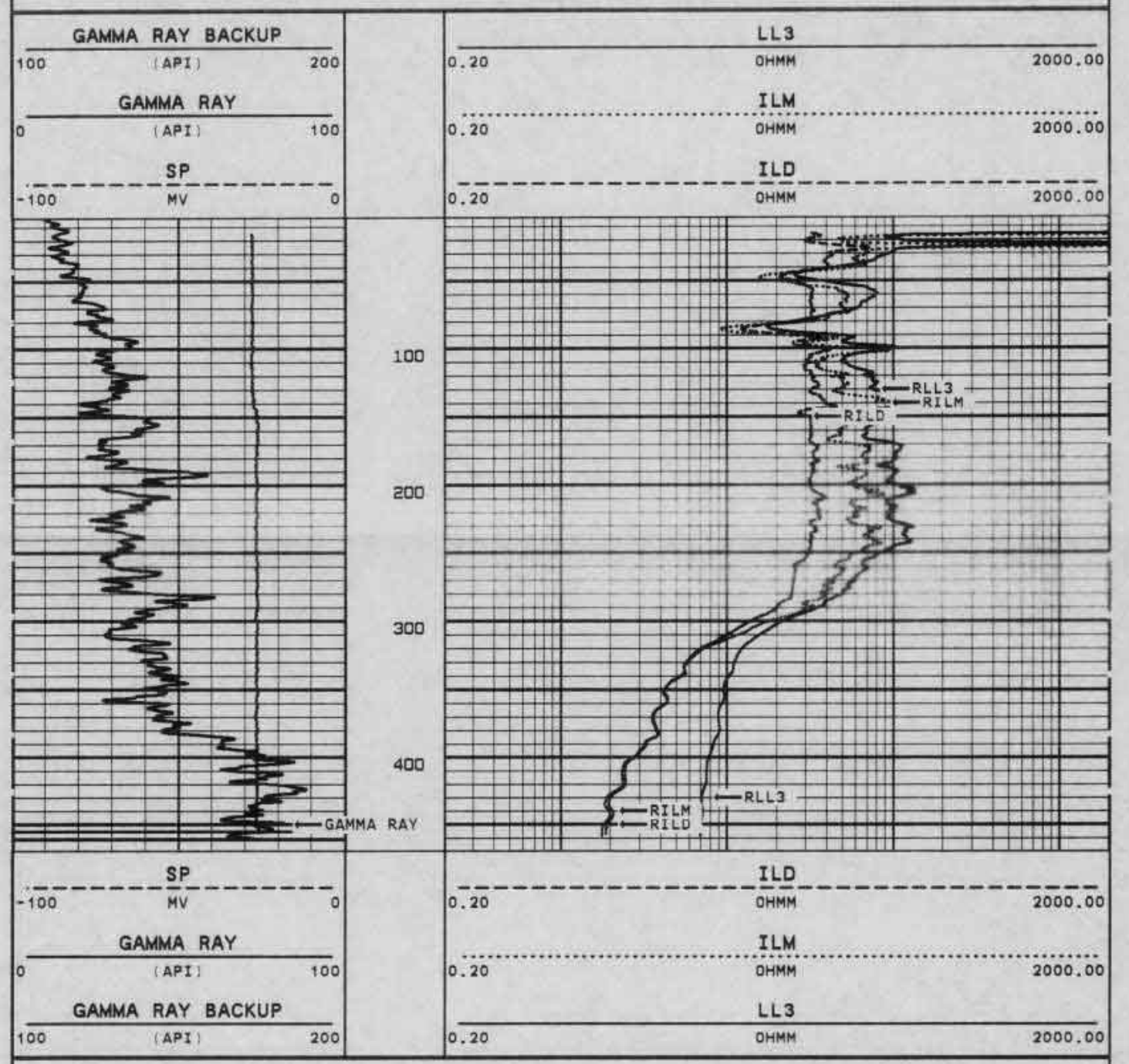
-- ILM MEASURE POINT --12.5 FT. FROM BOT

-- LL3 MEASURE POINT --3.2 FT. FROM BOT

-- BOT

VERSION: 2.42

FINISH DEPTH: 9.4 FEET DIRECTION: UP DATE: 11/30/97 TIME: 14:22:57 MODE: TRACE PLAYBACK

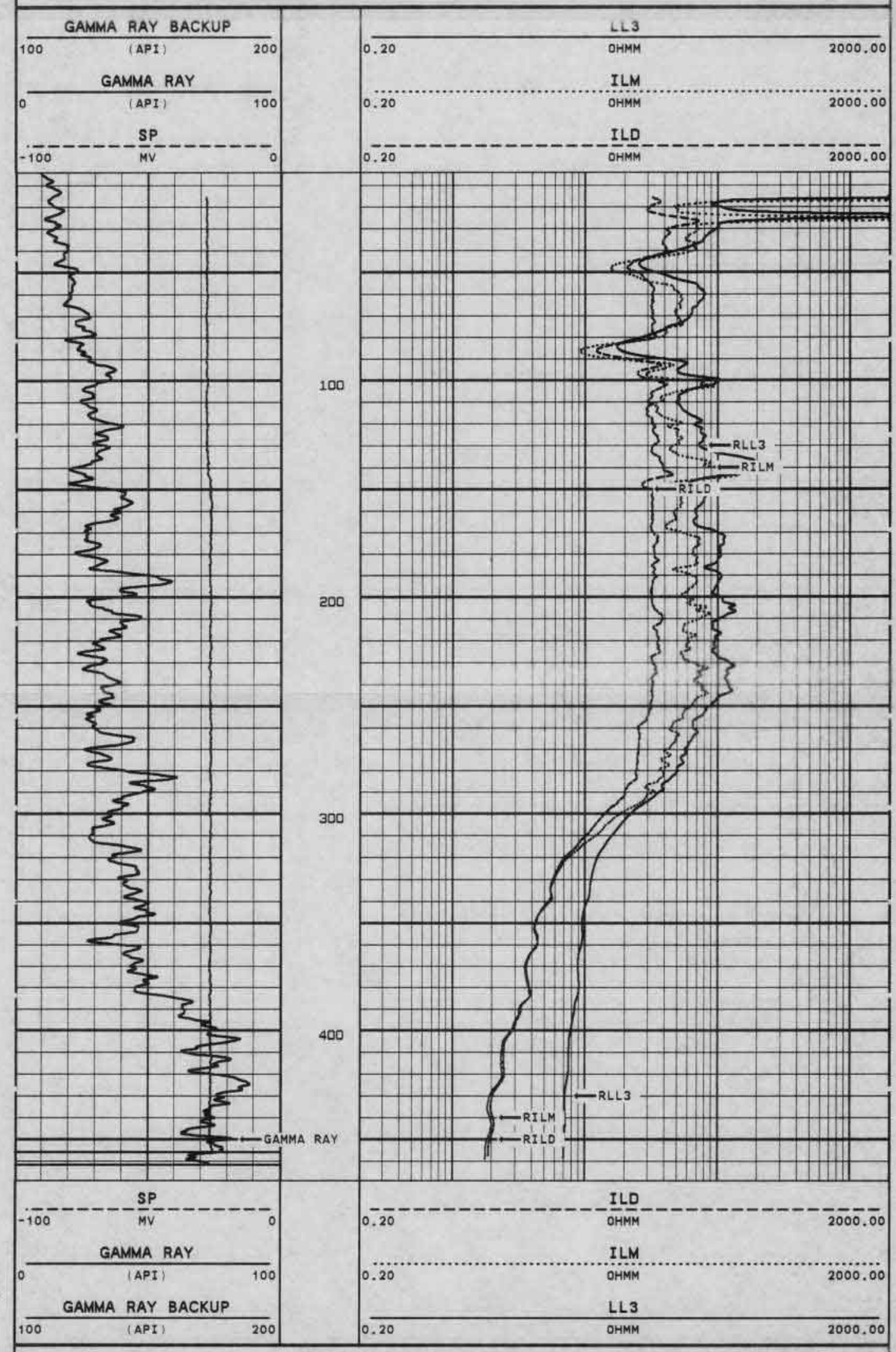


START DEPTH: 469.2 FEET DIRECTION: UP DATE: 11/30/97 TIME: 14:21:36 MODE: TRACE PLAYBACK

VERSION: 2.42

VERSION: 2.42

FINISH DEPTH: 9.4 FEET DIRECTION: UP DATE: 11/30/97 TIME: 14:21:15 MODE: TRACE PLAYBACK

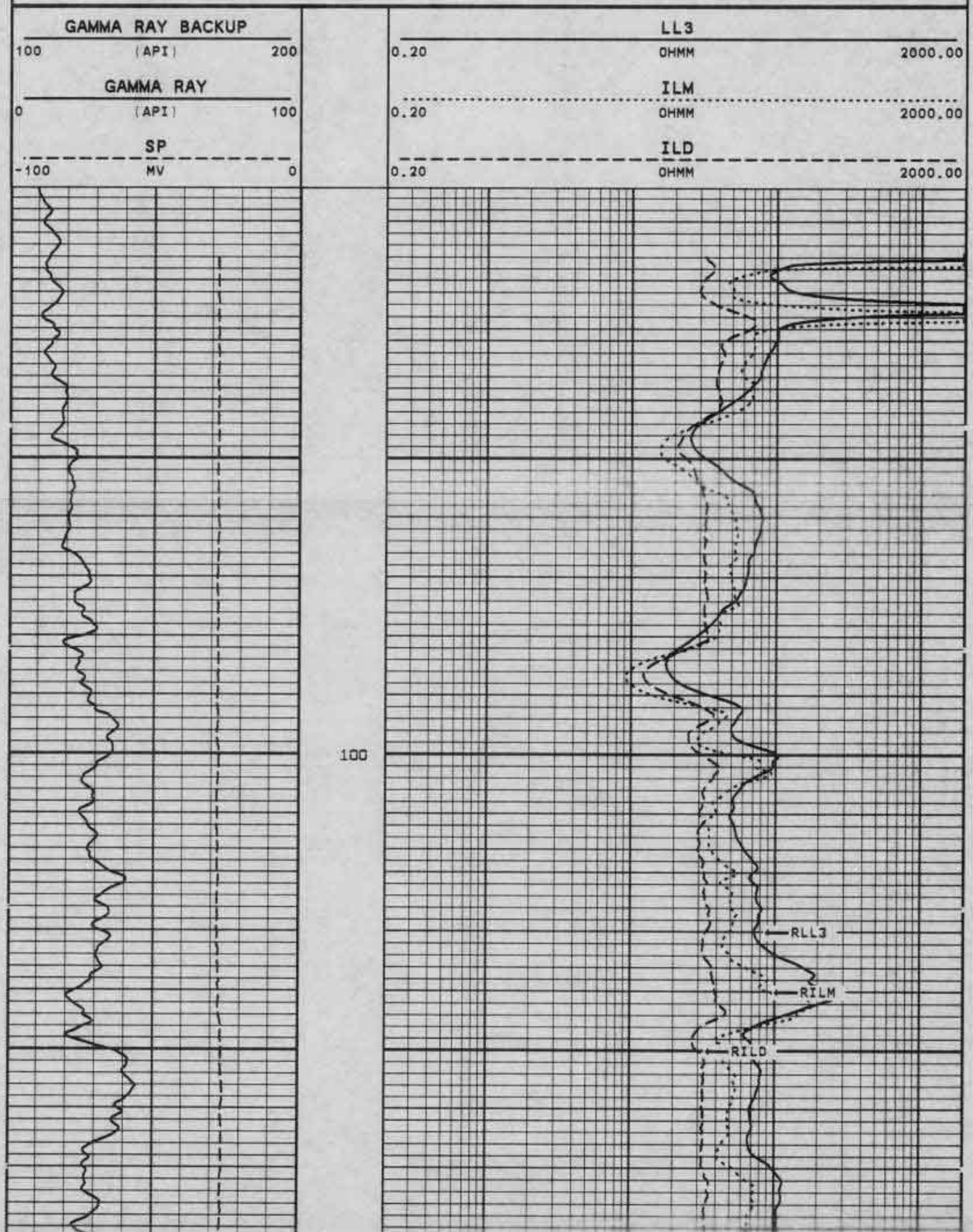


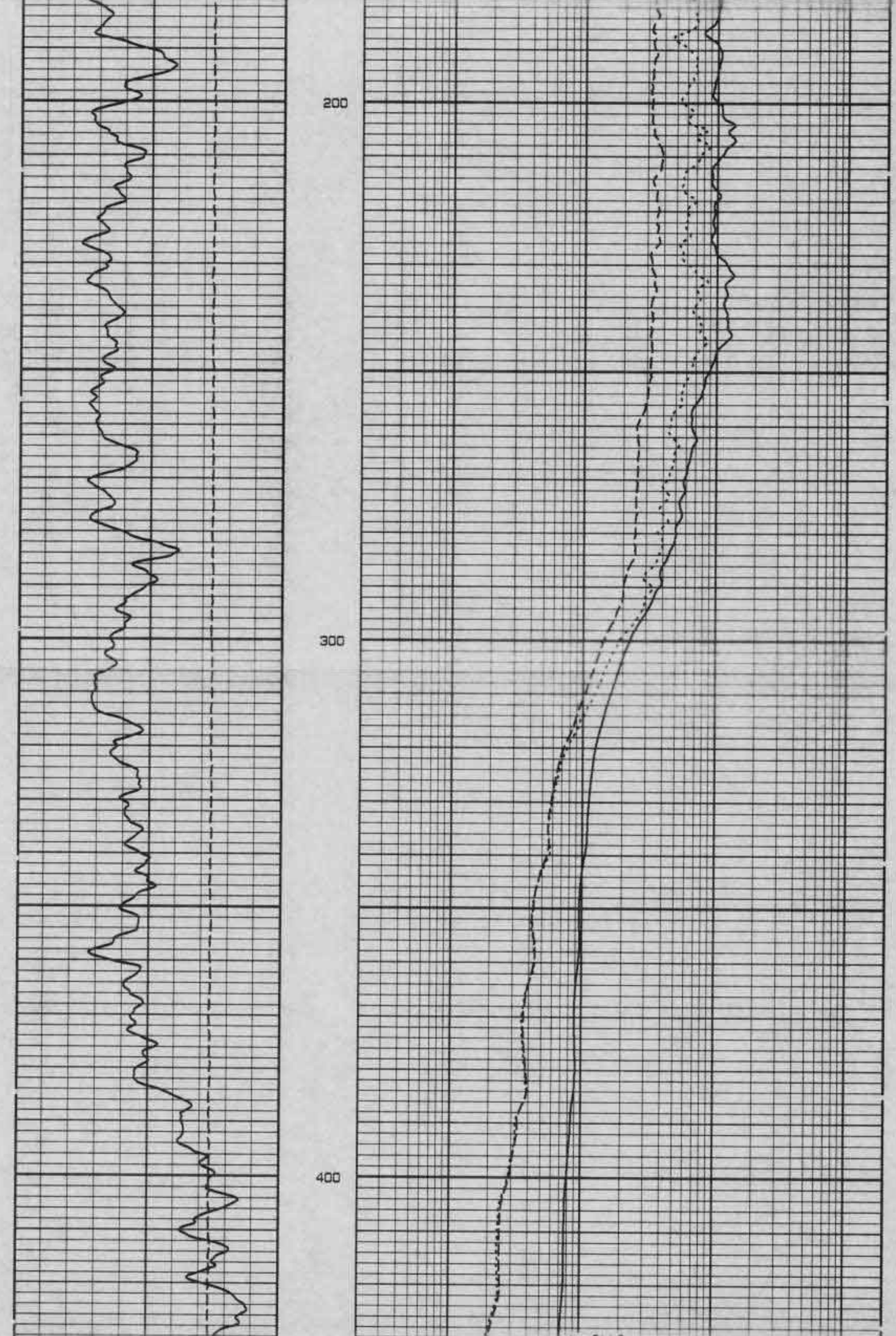
START DEPTH: 469.2 FEET DIRECTION: UP DATE: 11/30/97 TIME: 14:19:51 MODE: TRACE PLAYBACK

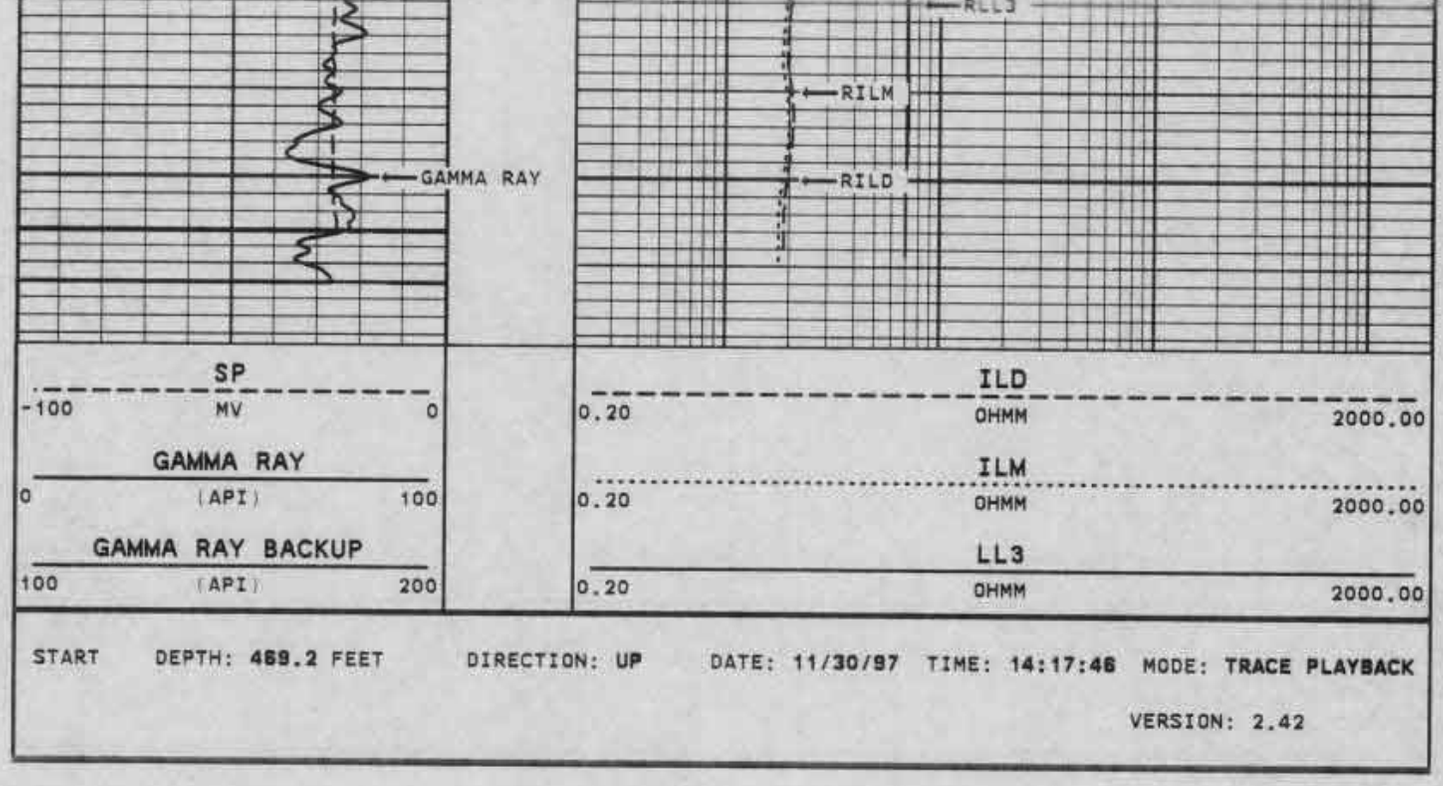
VERSION: 2.42

VERSION: 2.42

FINISH DEPTH: 9.4 FEET DIRECTION: UP DATE: 11/30/97 TIME: 14:19:23 MODE: TRACE PLAYBACK




200
300
400

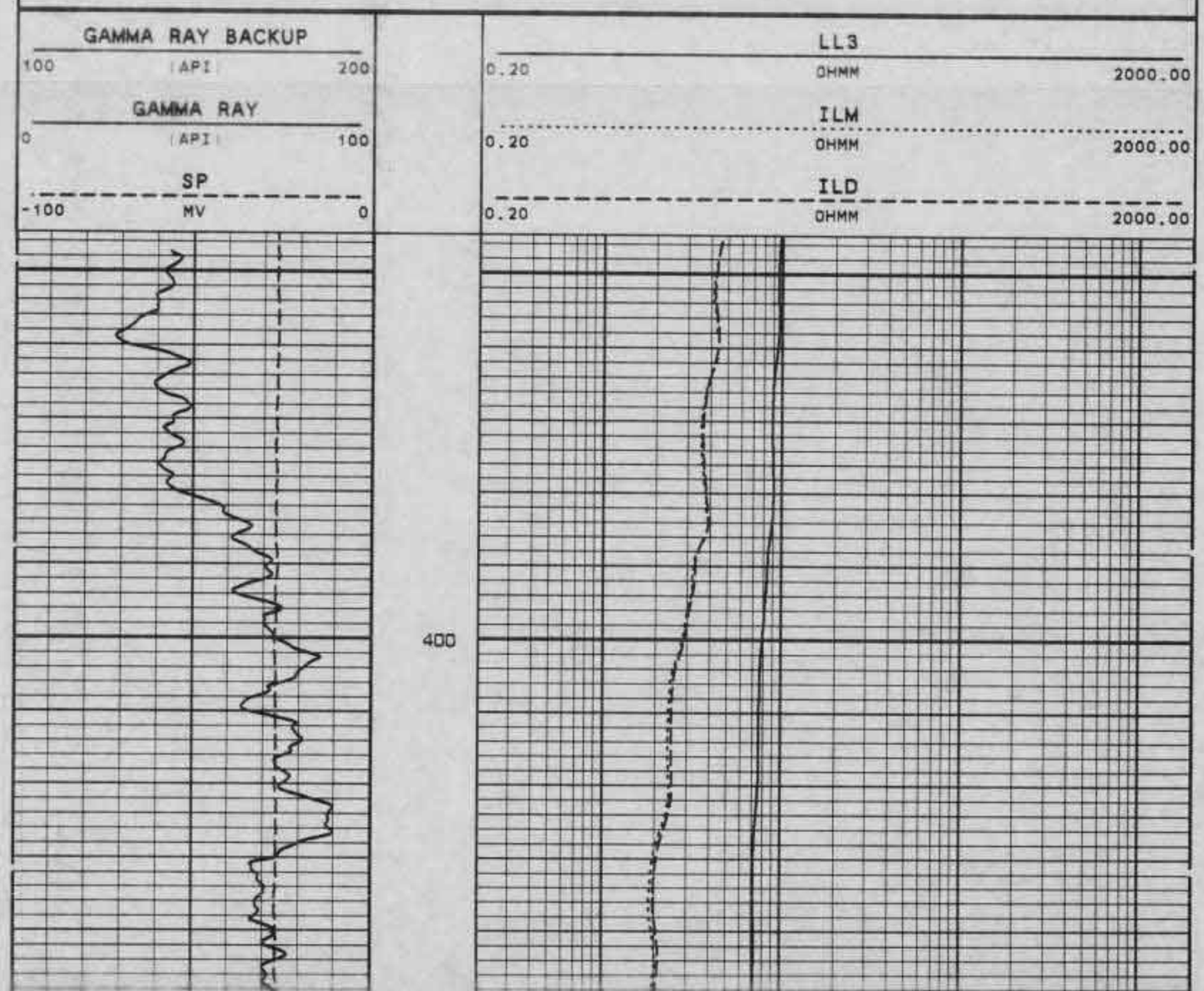


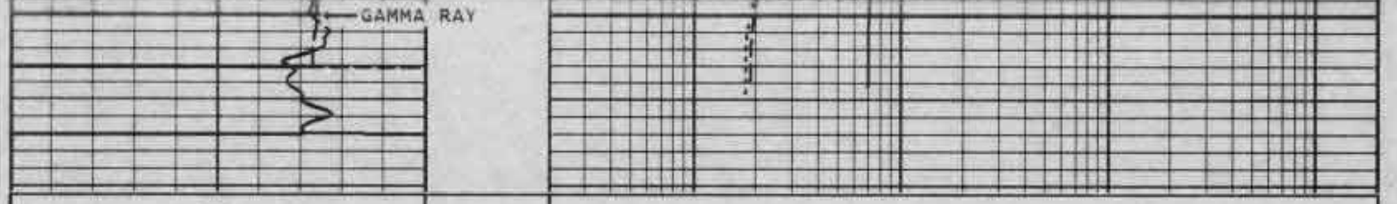
START DEPTH: 469.2 FEET DIRECTION: UP DATE: 11/30/97 TIME: 14:17:46 MODE: TRACE PLAYBACK

VERSION: 2.42

VERSION: 2.42

FINISH DEPTH: 349.9 FEET DIRECTION: UP DATE: 11/30/97 TIME: 14:16:08 MODE: TRACE PLAYBACK





SP		ILD
-100 MV 0		0.20 OHMM 2000.00
GAMMA RAY		ILM
0 (API) 100		0.20 OHMM 2000.00
GAMMA RAY BACKUP		LL3
100 (API) 200		0.20 OHMM 2000.00

START DEPTH: **471.0** FEET DIRECTION: **UP** DATE: **11/30/97** TIME: **14:15:33** MODE: **TRACE PLAYBACK**

VERSION: 2.42

MASTER CALIBRATION SUMMARY

FILE: DATE: 11/30/97 TIME: 14:12 VERSION: 2.42

ILD TOOL #10

DATE: 11/30/97 TIME: 10:05

	MEASURED	UNITS	STANDARD	MINIMUM	MAXIMUM	DEVIATION	UNITS
LOOP OPEN	45.0	MV	0.0	-0.3	1.5	0.41	MMHO
LOOP CLOSED	681.7	MV	400.0	398.7	401.6	0.55	MMHO

ILM TOOL #10

DATE: 11/30/97 TIME: 12:00

	MEASURED	UNITS	STANDARD	MINIMUM	MAXIMUM	DEVIATION	UNITS
LOOP OPEN	64.2	MV	0.0	-0.9	1.1	0.46	MMHO
LOOP CLOSED	751.4	MV	464.0	463.1	464.9	0.30	MMHO

LL3 TOOL #10

DATE: 11/30/97 TIME: 10:05

	MEASURED	UNITS	STANDARD	MINIMUM	MAXIMUM	DEVIATION	UNITS
BOX 1000 OHMS	79.7	MV	1.0	1.0	1.1	0.02	OHMS
BOX 100 OHMS	108.7	MV	10.0	10.0	10.4	0.05	OHMS
BOX 10 OHMS	409.2	MV	100.0	99.8	100.4	0.13	OHMS
BOX 1 OHMS	2543.6	MV	1000.0	999.1	1001.2	1.11	OHMS

COMPANY CITY OF FT.LAUDERDALE

FIVEASH WATER TREATMENT PLANT

WELL ASR #1

FIELD FIVEASH STATE FLORIDA

FLORIDA GEOPHYSICAL LOGGING, INC.

X-Y CALIPER GAMMA RAY LOG

FILE NO. _____

COMPANY CITY OF FT.LAUDERDALE, M.I.P.

WELL ASR #1

FIELD FIVEASH

COUNTY BROWARD

STATE FLORIDA

LOCATION: SEC. TWP. RGE.

PERMANENT DATUM: GROUND LEVEL ELEV. 0 FT. ABOVE PERMANENT DATUM

LOG MEASURED FROM PAD ELEV. 0 FT. ABOVE PERMANENT DATUM

DRILLING MEASURED FROM TOP OF CASING

DATE 11/30/87

RUN NO. ONE

TYPE LOG CALIPER

DEPTH DRILLER 470

DEPTH LOGGER 470

BTM. LOG INTERVAL 470

TOP LOG INTERVAL SURFACE

CASING DRILLER 10" @ SURFACE

CASING LOGGER 10" @ SURFACE

BIT SIZE 9 7/8"

TYPE FLUID IN HOLE WATER

DENSITY / VISCOSITY NA

PH / FLUID LOSS NA

SOURCE OF SAMPLE NA

RM @ MEAS. TEMP. NA

RMF @ MEAS. TEMP. NA

RMC @ MEAS. TEMP. NA

SOURCE OF RMF / RMC NA

RM @ BHT NA

TIME CIRC. STOPPED 10:00

TIME LOGGER ON BOTTOM 11:45

MAX. REC. TEMP. DEG. F 90

EQUIPMENT NUMBER 1 SE

LOCATION

RECORDED BY

WITNESSED BY

RUN NO. TWO

TYPE LOG GAMMA RAY

DEPTH DRILLER 470

DEPTH LOGGER 470

BTM. LOG INTERVAL 470

TOP LOG INTERVAL SURFACE

CASING DRILLER 10" @ SURFACE

CASING LOGGER 10" @ SURFACE

BIT SIZE 9 7/8"

TYPE FLUID IN HOLE WATER

DENSITY / VISCOSITY NA

PH / FLUID LOSS NA

SOURCE OF SAMPLE NA

RM @ MEAS. TEMP. NA

RMF @ MEAS. TEMP. NA

RMC @ MEAS. TEMP. NA

SOURCE OF RMF / RMC NA

RM @ BHT NA

TIME CIRC. STOPPED 10:00

TIME LOGGER ON BOTTOM 11:45

MAX. REC. TEMP. DEG. F 90

EQUIPMENT NUMBER 1 SE

LOCATION

RECORDED BY

WITNESSED BY

RUN NO. THREE

TYPE LOG

DEPTH DRILLER

DEPTH LOGGER

BTM. LOG INTERVAL

TOP LOG INTERVAL

CASING DRILLER

CASING LOGGER

BIT SIZE

TYPE FLUID IN HOLE

DENSITY / VISCOSITY

PH / FLUID LOSS

SOURCE OF SAMPLE

RM @ MEAS. TEMP.

RMF @ MEAS. TEMP.

RMC @ MEAS. TEMP.

SOURCE OF RMF / RMC

RM @ BHT

TIME CIRC. STOPPED

TIME LOGGER ON BOTTOM

MAX. REC. TEMP. DEG. F

EQUIPMENT NUMBER

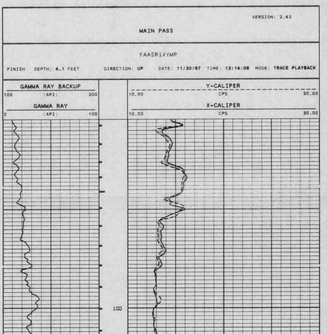
LOCATION

RECORDED BY

WITNESSED BY

REMARKS

XY CALIPER/GAMMA RAY TOOL STRING CONFIGURATION

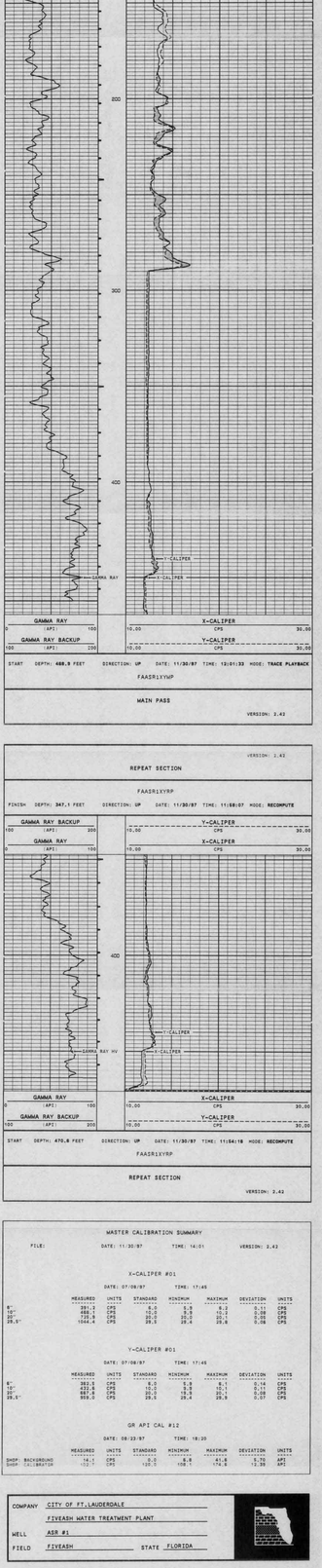


VERSION: 2.42

MAIN PASS

FAASRIXYMP

FINISH: DEPTH: 4.1 FEET DIRECTION: UP DATE: 11/30/87 TIME: 13:14:08 MODE: TRACE PLAYBACK



START DEPTH: 468.9 FEET DIRECTION: UP DATE: 11/30/87 TIME: 13:01:33 MODE: TRACE PLAYBACK

FAASRIXYMP

MAIN PASS

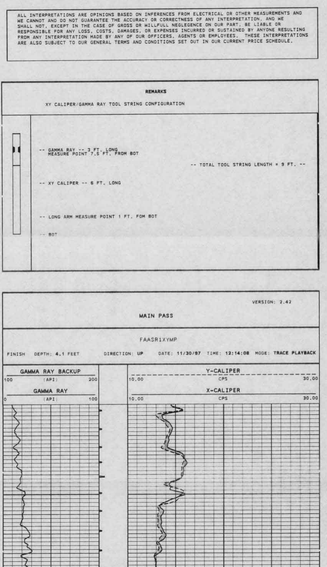
VERSION: 2.42

VERSION: 2.42

REPEAT SECTION

FAASRIXYRP

FINISH: DEPTH: 347.1 FEET DIRECTION: UP DATE: 11/30/87 TIME: 11:58:57 MODE: RECOMPUTE



START DEPTH: 470.9 FEET DIRECTION: UP DATE: 11/30/87 TIME: 11:54:18 MODE: RECOMPUTE

FAASRIXYRP

REPEAT SECTION

VERSION: 2.42

MASTER CALIBRATION SUMMARY

FILE: DATE: 11/30/87 TIME: 14:01 VERSION: 2.43

X-CALIPER #01

DATE: 07/08/87 TIME: 17:45

	MEASURED	UNITS	STANDARD	MINIMUM	MAXIMUM	DEVIATION	UNITS
6"	391.2	CPS	6.0	5.8	6.2	0.11	CPS
10"	488.1	CPS	10.0	9.8	10.2	0.08	CPS
20"	728.9	CPS	20.0	20.0	20.1	0.02	CPS
28.5"	1044.4	CPS	29.3	29.4	29.8	0.06	CPS

Y-CALIPER #01

DATE: 07/08/87 TIME: 17:45

	MEASURED	UNITS	STANDARD	MINIMUM	MAXIMUM	DEVIATION	UNITS
6"	383.8	CPS	6.0	5.8	6.1	0.14	CPS
10"	482.6	CPS	10.0	9.9	10.1	0.11	CPS
20"	687.0	CPS	20.0	19.8	20.2	0.08	CPS
28.5"	959.0	CPS	29.5	29.4	29.9	0.07	CPS

GR API CAL #12

DATE: 08/23/87 TIME: 10:20

	MEASURED	UNITS	STANDARD	MINIMUM	MAXIMUM	DEVIATION	UNITS
SHOP BACKGROUND	0.0	CPS	0.0	0.0	0.0	0.00	API
SHOP CALIBRATOR	152.7	CPS	125.0	108.7	174.8	12.38	API

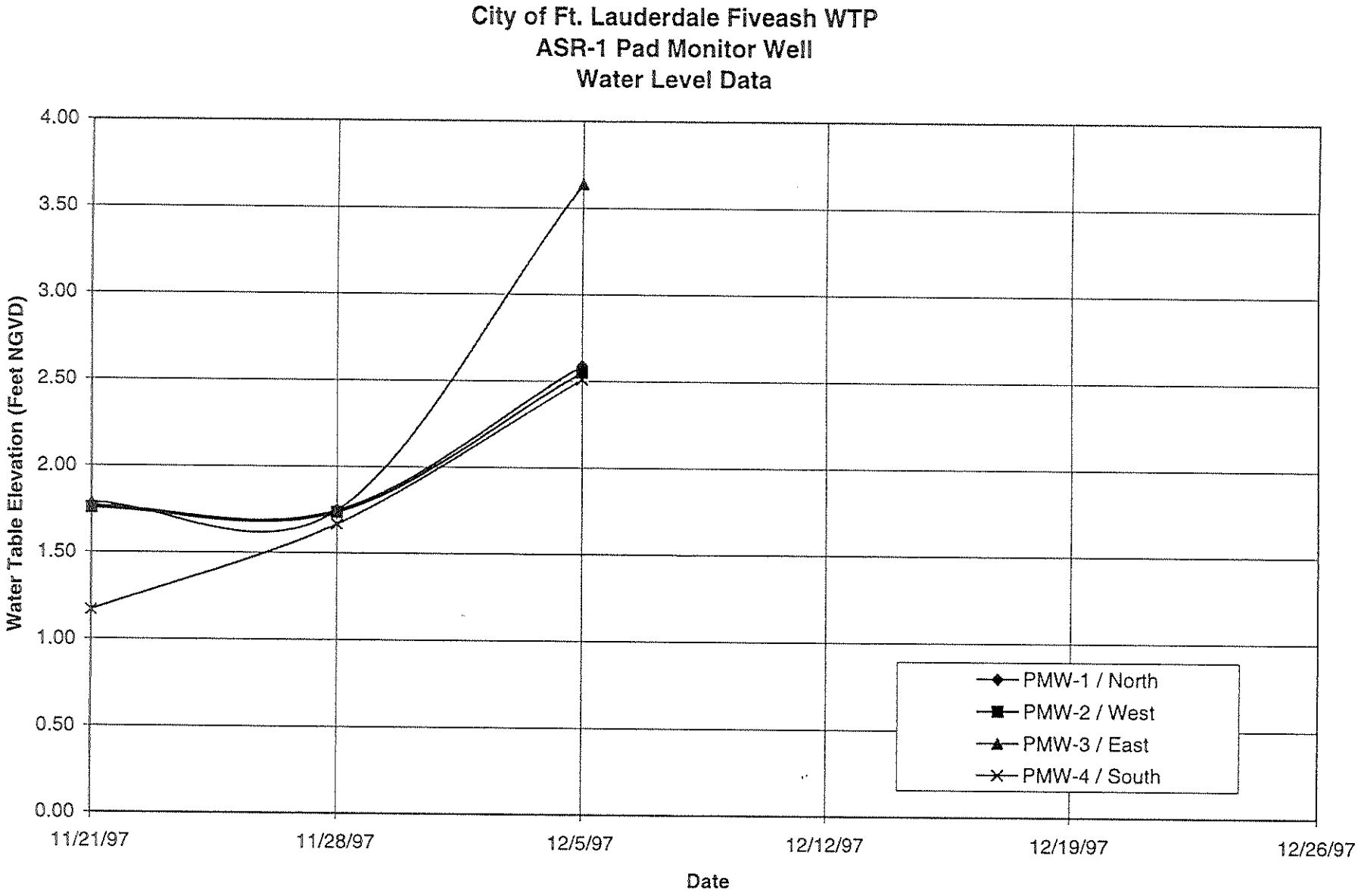
COMPANY CITY OF FT.LAUDERDALE

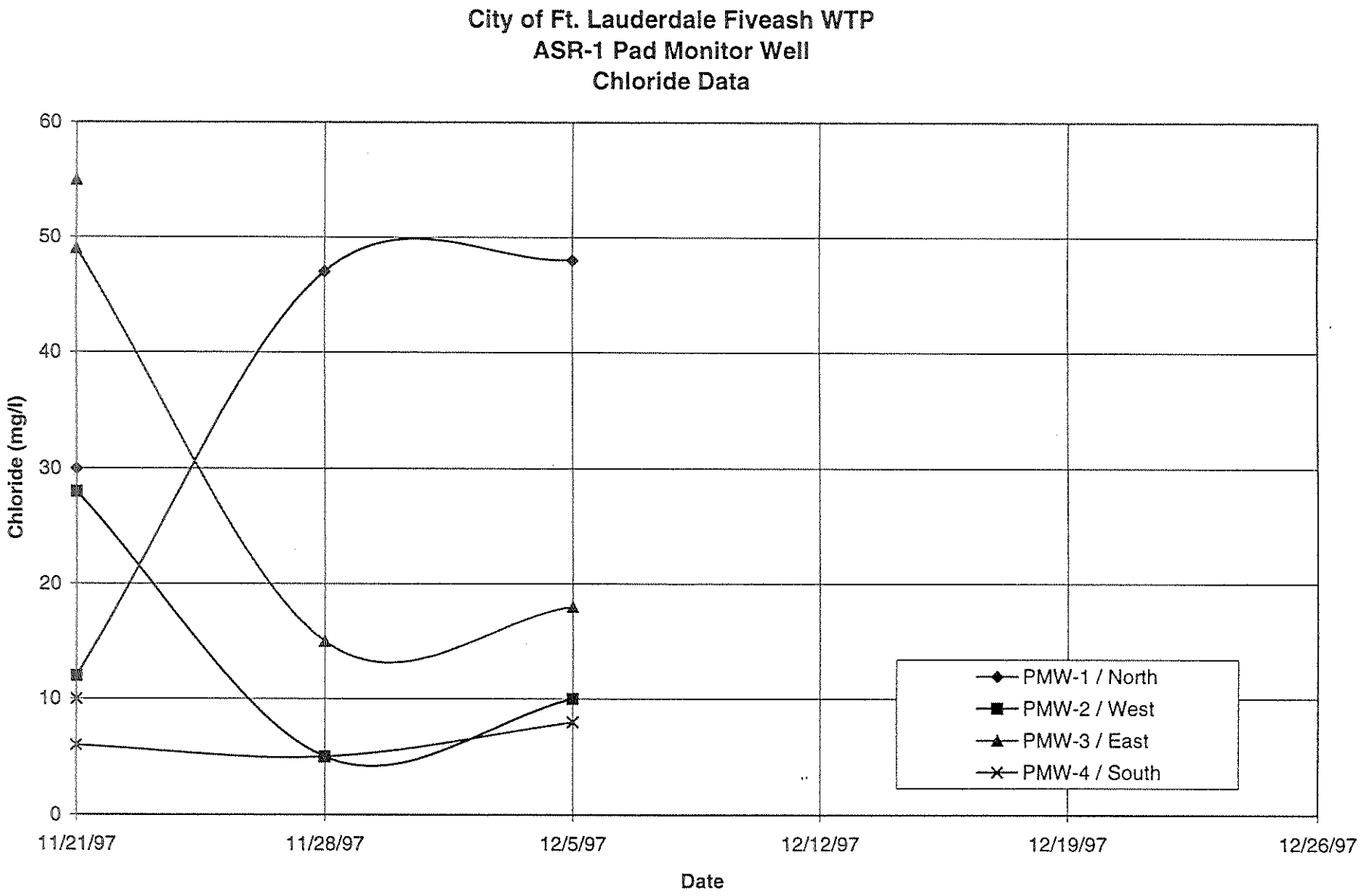
WELL FIVEASH WATER TREATMENT PLANT

WELL ASR #1

FIELD FIVEASH STATE FLORIDA

Date	Reporting Agency	ASR-1																											
		PMW-1 / North								PMW-2 / West								PMW-3 / East								PMW-4 / South							
		Depth to Water (ft)	Elevation Top of Casing (ft)	Elevation Water Table (ft)	Field Temp (°C)	Lab Temp (°C)	Conductivity (µmhos/cm)	Chloride (mg/l)	TDS (mg/l)	Depth to Water (ft)	Elevation Top of Casing (ft)	Elevation Water Table (ft)	Field Temp (°C)	Lab Temp (°C)	Conductivity (µmhos/cm)	Chloride (mg/l)	TDS (mg/l)	Depth to Water (ft)	Elevation Top of Casing (ft)	Elevation Water Table (ft)	Field Temp (°C)	Lab Temp (°C)	Conductivity (µmhos/cm)	Chloride (mg/l)	TDS (mg/l)	Depth to Water (ft)	Elevation Top of Casing (ft)	Elevation Water Table (ft)	Field Temp (°C)	Lab Temp (°C)	Conductivity (µmhos/cm)	Chloride (mg/l)	TDS (mg/l)
11/21/97	Sanders		10.23			26.7	539	30	335		10.44			26.1	524	12	326		10.25			26.5	667	55	413		9.69			26.5	156	10	104
11/21/97	FTL	8.46		1.77	27.5	22.7	506	12		8.68		1.76	27.5	22.9	523	28		8.46		1.79	27.5	23.2	661	49		8.52		1.17	27.5	22.9	179	6	
11/28/97	FTL	8.48		1.75	27.8		638	47	320	8.70		1.74	27.8		504	5	532	8.50		1.75	28.3		404	15	100	8.02		1.67	27.8		149	5	32
12/5/97	FTL	7.64		2.59	27.5	23.4	641	48	250	7.89		2.55	27.5	23.5	471	10	50	6.61		3.64	27.0	23.3	390	18	204	7.18		2.51	26.5	23.3	155	8	86
12/12/97																																	
12/19/97																																	
12/26/97																																	


City of Ft. Lauderdale Fiveash WTP
ASR-1 Pad Monitor Well
Water Level Data
Water Table Elevation (Feet NGVD)
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
11/21/97
11/28/97
12/5/97
12/12/97
12/19/97
12/26/97
Date
PMW-1 / North
PMW-2 / West
PMW-3 / East
PMW-4 / South


City of Ft. Lauderdale Fiveash WTP
ASR-1 Pad Monitor Well
Chloride Data
Chloride (mg/l)
60
50
40
30
20
10
0
11/21/97
11/28/97
12/5/97
12/12/97
12/19/97
12/26/97
Date
PMW-1 / North
PMW-2 / West
PMW-3 / East
PMW-4 / South