WELL COMPLETION REPORT

FORM 0124
Rev. 4/85

WELL PERMIT NO. _____

School Board of St Lucie Co. | 2909 Delaware Ave | Ft. Pierce | FL | 34947
Owner | Address | City | State | Zip

unk. | 16 | SLMW245
Completion Date | Casing Depth | Total Depth | Well #

Contractor's Name | License No.

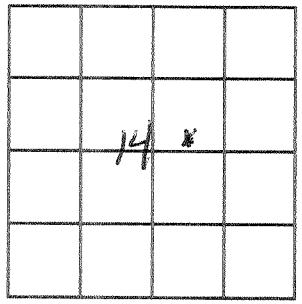
Driller's Name | Registration No.

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

LOCATION
Located Near Lakewood Park Elementary School
County St Lucie Co

SW NE 14 34S 39E
¼ ¼ Section Township Range

27° 31' 18" 80° 24' 17"
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	Casing & Screen		Depth (ft)		DRILL CUTTINGS LOG Examine cuttings every 20 ft. or at formation changes Give color, grain size, and type of material Note cavities, depth to producing zones.
Thick-ness & Depth	Diameter & Depth		From	To	
Number of bags					

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

WELL COMPLETION REPORT

FORM 0124
Rev. 4/85

WELL PERMIT NO. _____

SFWMD
Owner

Address

City

State

Zip

0-50' 50'-140' 142' SLMW24D
Casing Depth / Total Depth / Well #

Contractor's Signature

License No.

Completion Date

Tony Lubrano
Driller's Name

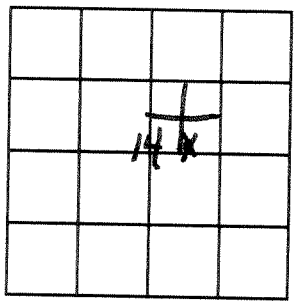
Registration No.

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

LOCATION
Located Near Lake Wood Park Elementary School
County St Lucie

SW NE 14 34S 39E
¼ ¼ Section Township Range

27°31'18" 80°24'17"
Latitude-Longitude



LOCATE IN SECTION

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

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

Grout Thick-ness & 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.
Number of bags					

Casing: Black Steel ( ) Galv. ( ) PVC (✓) Fiberglass ( )
Screen: Type PVC Slot size 0.020
Screened from 50 (ft.) to 55 (ft.)
Type of grout with % additives Neat
Water: Clear ( ) Colored ( ) Sulphur ( ) Salty ( ) Iron ( )
Conductivity _____ Chlorides _____ mg/l

HELSETH ENGINEERING, INC.

P. O. BOX 4351
FT. PIERCE, FL 34948

(407)464-2670

LETTER OF TRANSMITTAL

DATE	JOB NO.
12/26/90	

ATTENTION Don Padgett

RE: Lakewood Park Elementary School Groundwater Monitoring, St. Lucie Co.

TO Hydrogeology Section
South Florida Water Management District
P.O. Box 24680
West Palm Beach, FL 33416

WE ARE SENDING YOU ☒ Attached ☐ Under separate cover via _____ the following items:

☐ Shop drawings ☐ Prints ☐ Plans ☐ Samples ☐ Specifications

☐ Copy of letter ☐ Change order ☐ _____

COPIES	DATE	NO.	DESCRIPTION
1	2/22/88		Well completion reports for well Nos. 1-3
1	2/11/90		Well completion report for well No. 4
1	—		Tabulation of all monitoring data
1	12/21/90		Tabulation of all water level data
1	12/12/90		Calculation of groundwater (water table) gradient for 12/12/90
1	11/9/87		Site Plan

THESE ARE TRANSMITTED as checked below:

☐ For approval ☐ Approved as submitted ☐ Resubmit ___ copies for approval

☒ For your use ☐ Approved as noted ☐ Submit ___ copies for distribution

☐ As requested ☐ Returned for corrections ☐ Return ___ corrected prints

☐ For review and comment ☐ _____

☐ FOR BIDS DUE _____, 19___ ☐ PRINTS RETURNED AFTER LOAN TO US

REMARKS

Don,

We weren't able to tie our wells into the benchmark you provided for us. Well casing elevations are referenced only to eachother. We appreciate the information you provided for us on the SFWMD monitor well.

COPY TO Paul Phillips, Ed. D.

SIGNED: Bill Thiess

WELL CO[illegible]TION REPORT FORM 0124 Rev. 4/85 **PERMIT NO.** _____

St. Lucie County School Board - 2909 Delaware Ave. - Ft. Pierce, Fl. 34947-3696
Owner Address City State Zip

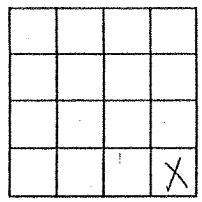
9145 2-22-88 10 17 1
Contractor's Signature License No. Completion Date Casing Depth Total Depth Well #

Leonard Crocco 40534
Driller's Name Registration No.

TYPE OF WORK: Construct (X) Repair ( ) Abandon ( )
WELL USE: Domestic Well ( ) Public ( ) Monitor (X) Test ( )
Irrigation ( ) Fire Well ( ) Other _____
METHOD: Rotary with MUD (X) or Air ( ), Cable Tool ( ), Jet ( )
Casing Driven ( ), Other _____
STATIC WATER LEVEL 5 Ft. below top of casing
PUMPING WATER LEVEL _____ Ft. after _____ Hrs. at _____ GPM
PUMP SIZE _____ H.P. CAPACITY _____ GPM
PUMP TYPE _____ INTAKE DEPTH _____ From top of ground

LOCATION
Located Near Lakewood Park School
County St. Lucie
14 34-S 39E
¼ ¼ Section Township Range
Latitude-Longitude

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



LOCATE IN SECTION

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	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.
1'	2"	17	0	1	BR. F. SAND W/SURF. ORG.
8'			1	2.5	DK. BR. SILTY SAND
			2.5	3	GREY F. SAND
			3	4	HARDPAN
			4	9	TAN SILTY SAND
			9	11	TAN F. SAND TR. F. shell
			11	17	GREY F. SAND SOME F. shell
Number of bags					
1					

Casing: Black Steel ( ) Galv. ( ) PVC (X) Fiberglass ( )
Screen: Type PVC Slot size .020
Screened from 10 (ft.) to 15 (ft.) 2' BLANK
Type of grout with % additives PORTLAND
Water: Clear (X) Colored ( ) Sulphur ( ) Salty ( ) Iron ( )
Conductivity _____ Chlorides _____ mg/l

WELL COMPLETION REPORT FORM 0124 Rev. 4/85 **WELL PERMIT NO.** _____

St. Lucie County School Board - 2909 Delaware Ave. - Ft. Pierce, Fl. 34947-3696
Owner Address City State Zip

9145 2-22-88 10 17 2
Contractor's Signature License No. Completion Date Casing Depth Total Depth Well #

Leonard Crocco 40534
Driller's Name Registration No.

TYPE OF WORK: Construct (X) Repair ( ) Abandon ( )
WELL USE: Domestic Well ( ) Public ( ) Monitor (X) Test ( )
Irrigation ( ) Fire Well ( ) Other _____
METHOD: Rotary with MUD (X) or Air ( ), Cable Tool ( ), Jet ( )
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PUMPING WATER LEVEL _____ Ft. after _____ Hrs. at _____ GPM
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PUMP TYPE _____ INTAKE DEPTH _____ From top of ground

LOCATION
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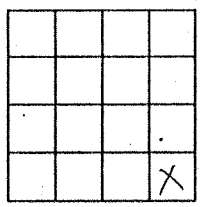
County St. Lucie
14 34S 39E
¼ ¼ Section Township Range
Latitude-Longitude

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



LOCATE IN SECTION

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8'			1	2.5	DK. BR. SILTY SAND
			2.5	3	GREY F. SAND
			3	4	HARDPAN
			4	9	TAN SILTY SAND
			9	11	TAN F. SAND TR. F. shell
			11	17	GREY F. SAND SOME F. shell
Number of bags					
1					

Casing: Black Steel ( ) Galv. ( ) PVC (X) Fiberglass ( )
Screen: Type PVC Slot size .020
Screened from 10 (ft.) to 15 (ft.) 2' BLANK
Type of grout with % additives PORTLAND
Water: Clear (X) Colored ( ) Sulphur ( ) Salty ( ) Iron ( )
Conductivity _____ Chlorides _____ mg/l

WELL COMPLETION REPORT FORM 0124 Rev. 4/85 **WELL PERMIT NO.** _____

St. Lucie County School Board - 2909 Delaware Ave. - Ft. Pierce, Fl. 34947-3696
Owner Address City State Zip

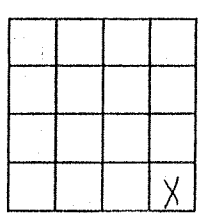
9145 2-22-88 10 17' 3
Contractor's Signature License No. Completion Date Casing Depth Total Depth Well #

Leonard Crocco 40534
Driller's Name Registration No.

TYPE OF WORK: Construct (X) Repair ( ) Abandon ( )
WELL USE: Domestic Well ( ) Public ( ) Monitor (X) Test ( )
Irrigation ( ) Fire Well ( ) Other _____
METHOD: Rotary with MUD (X) or Air ( ), Cable Tool ( ), Jet ( )
Casing Driven ( ), Other _____
STATIC WATER LEVEL 5 Ft. below top of casing
PUMPING WATER LEVEL _____ Ft. after _____ Hrs. at _____ GPM
PUMP SIZE _____ H.P. CAPACITY _____ GPM
PUMP TYPE _____ INTAKE DEPTH _____ From top of ground

LOCATION
Located Near Lakewood Park School
County St. Lucie
14 34-S 39E
¼ ¼ Section Township Range
Latitude-Longitude

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



LOCATE IN SECTION

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Grout Thickness & Depth	Casing & Screen Diameter & Depth		Depth (ft) From	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.
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			3	4	HARDPAN
			4	9	TAN SILTY SAND
			9	12	TAN SAND TR. of shell
			12	17	GREY F. SAND SOME F. shell
Number of bags					
1					

Casing: Black Steel ( ) Galv. ( ) PVC (X) Fiberglass ( )
Screen: Type PVC Slot size .020
Screened from 10 (ft.) to 15 (ft.) 2' BLANK
Type of grout with % additives PORTLAND
Water: Clear (X) Colored ( ) Sulphur ( ) Salty ( ) Iron ( )
Conductivity _____ Chlorides _____ mg/l

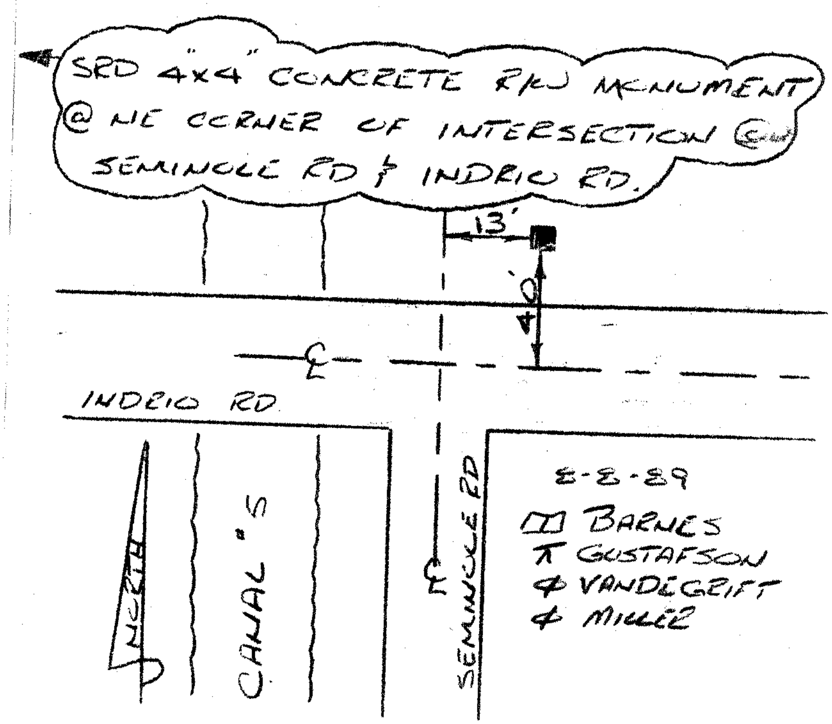
RECEIVED BY HELSETH ENGINEERING ON 2-29-88
FILE LWPES MW
c: P. Phillips DER

STA	+	HI	−	ELEV
		27.14		
TP			5.03 (8.66)	22.11
	5.20 (8.49)	27.31		
TP			5.42 (8.25)	21.89
	5.16 (8.53)	27.01		
TBM			1.95 (11.74)	25.06

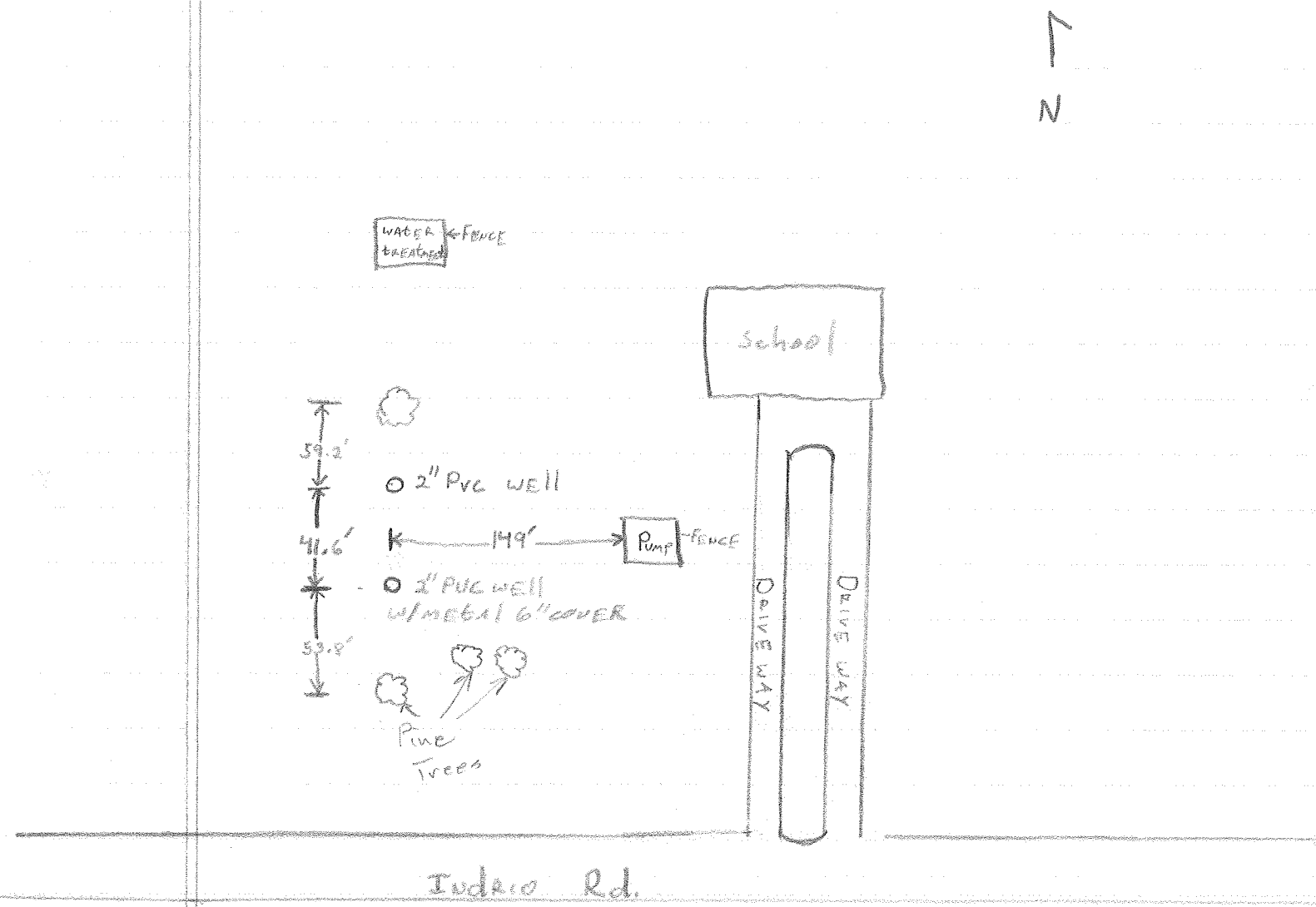
RETURN LEVELS

STA	+	HI	−	ELEV
	1.88 (11.81)	26.94		
TP			5.05 (8.64)	21.89
	5.37 (8.30)	27.26		
TP			5.10 (8.59)	22.16
	4.86 (8.83)	27.02		

SEC-14 TWP-34S RGE-39E

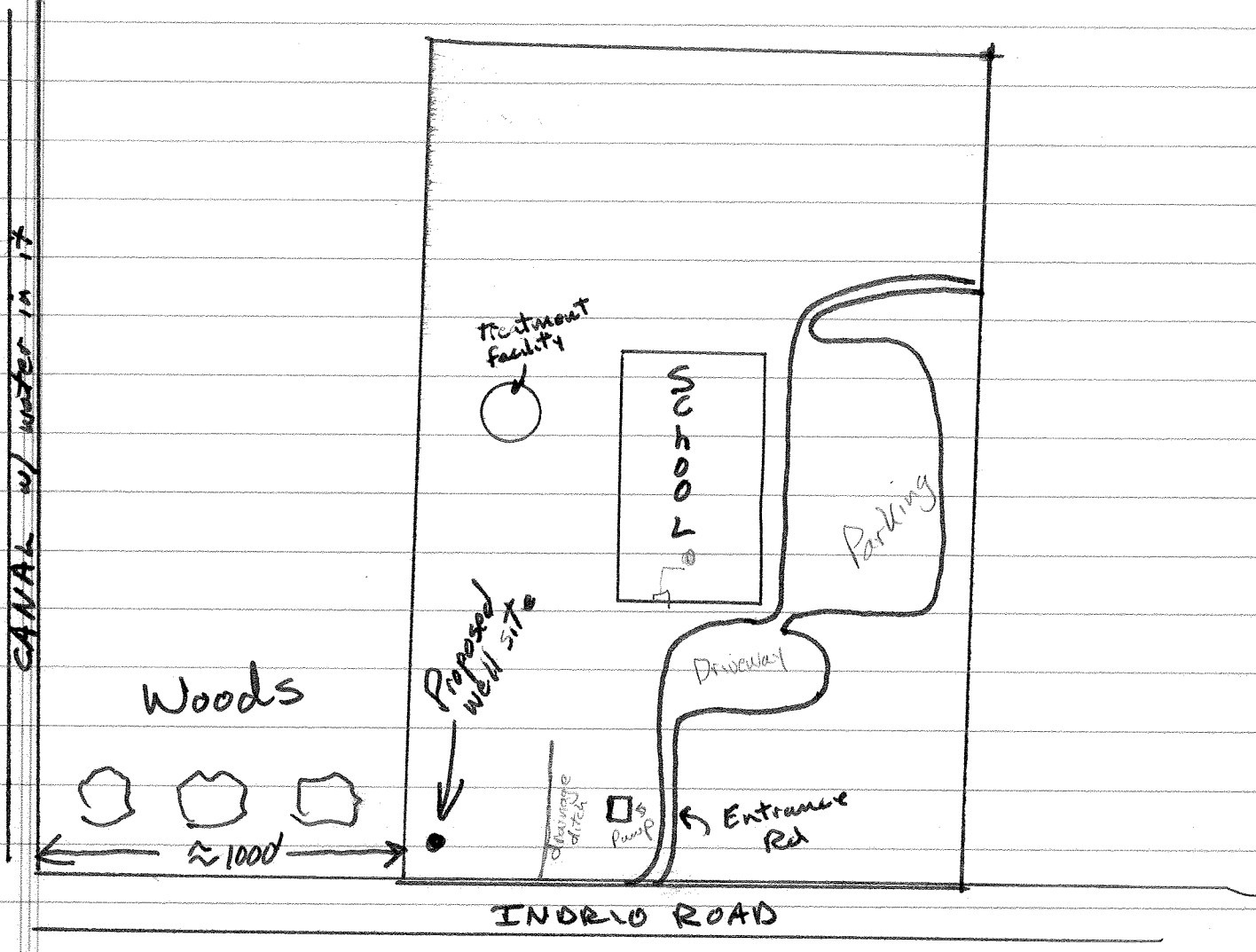


8-8-89
☐ BARNES
⊼ GUSTAFSON
⊕ VANDEGRIFT
⊕ MILLER


N
WATER TREATMENT
FENCE
School
59.2'
2" PVC WELL
41.6'
149'
PUMP
FENCE
2" PVC WELL W/METAL 6" COVER
59.8'
Pine Trees
DRIVE WAY
DRIVE WAY
Indio Rd.

Lakew. d Park Element / School

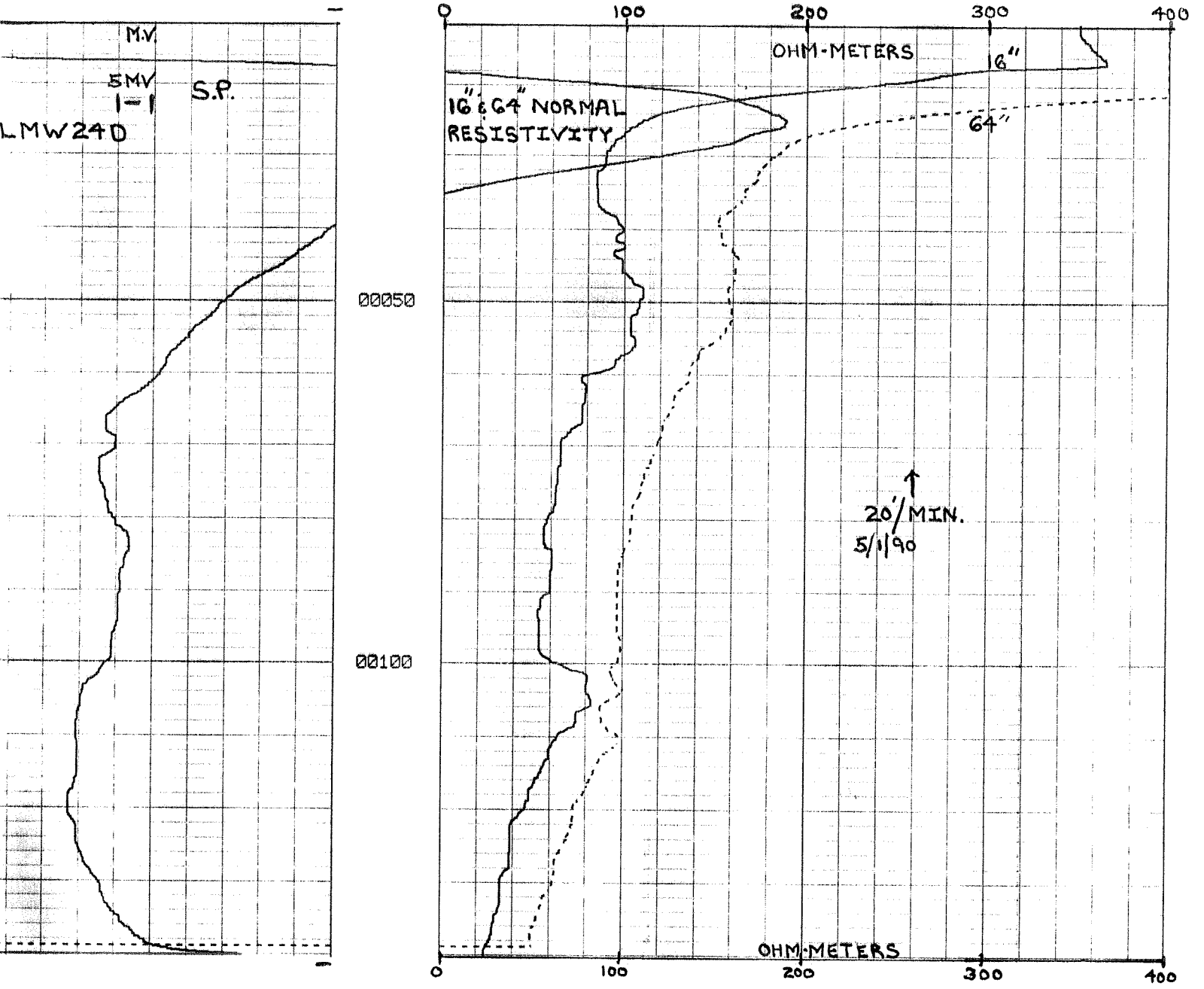
Principal – Herbert L. Dickerson

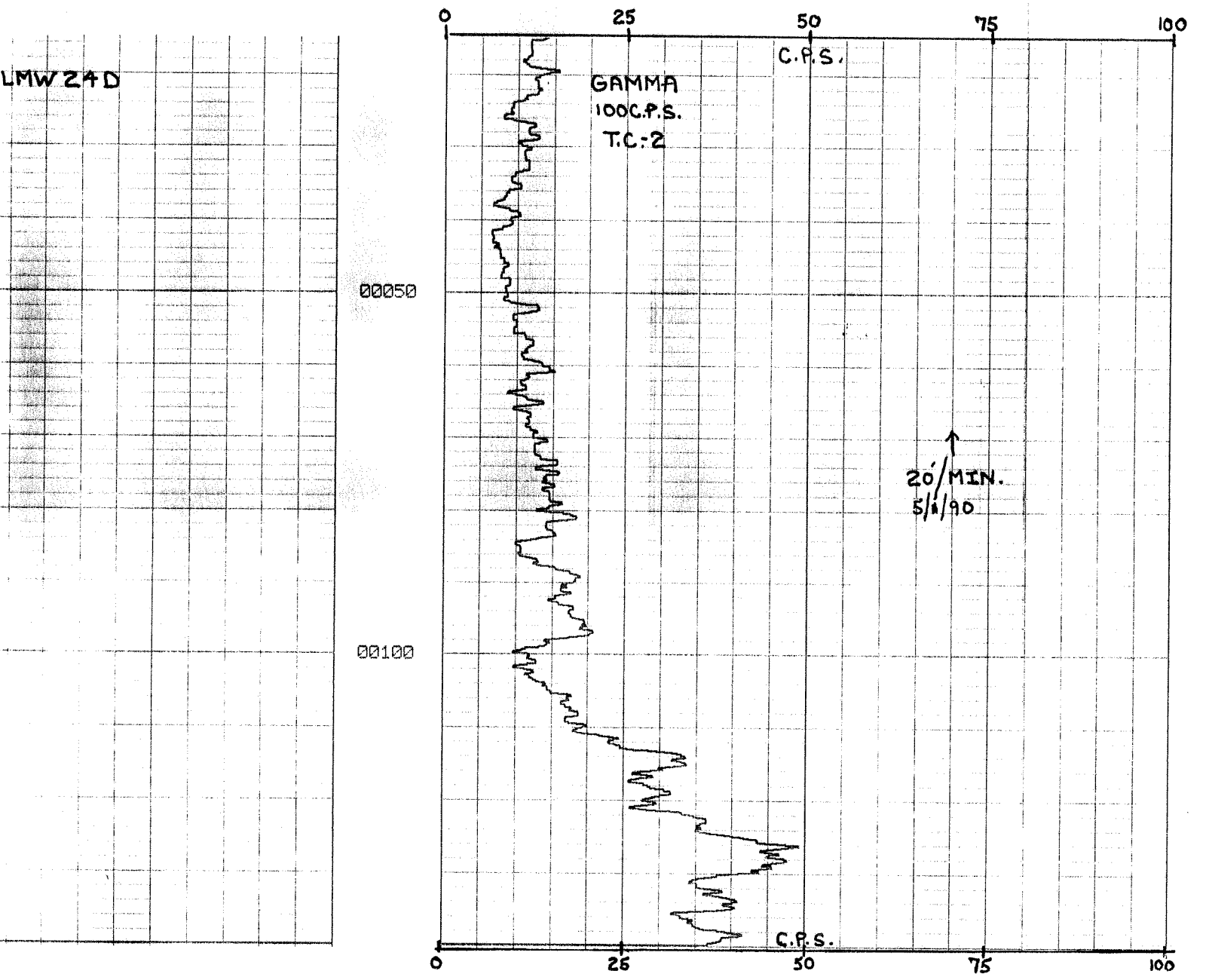


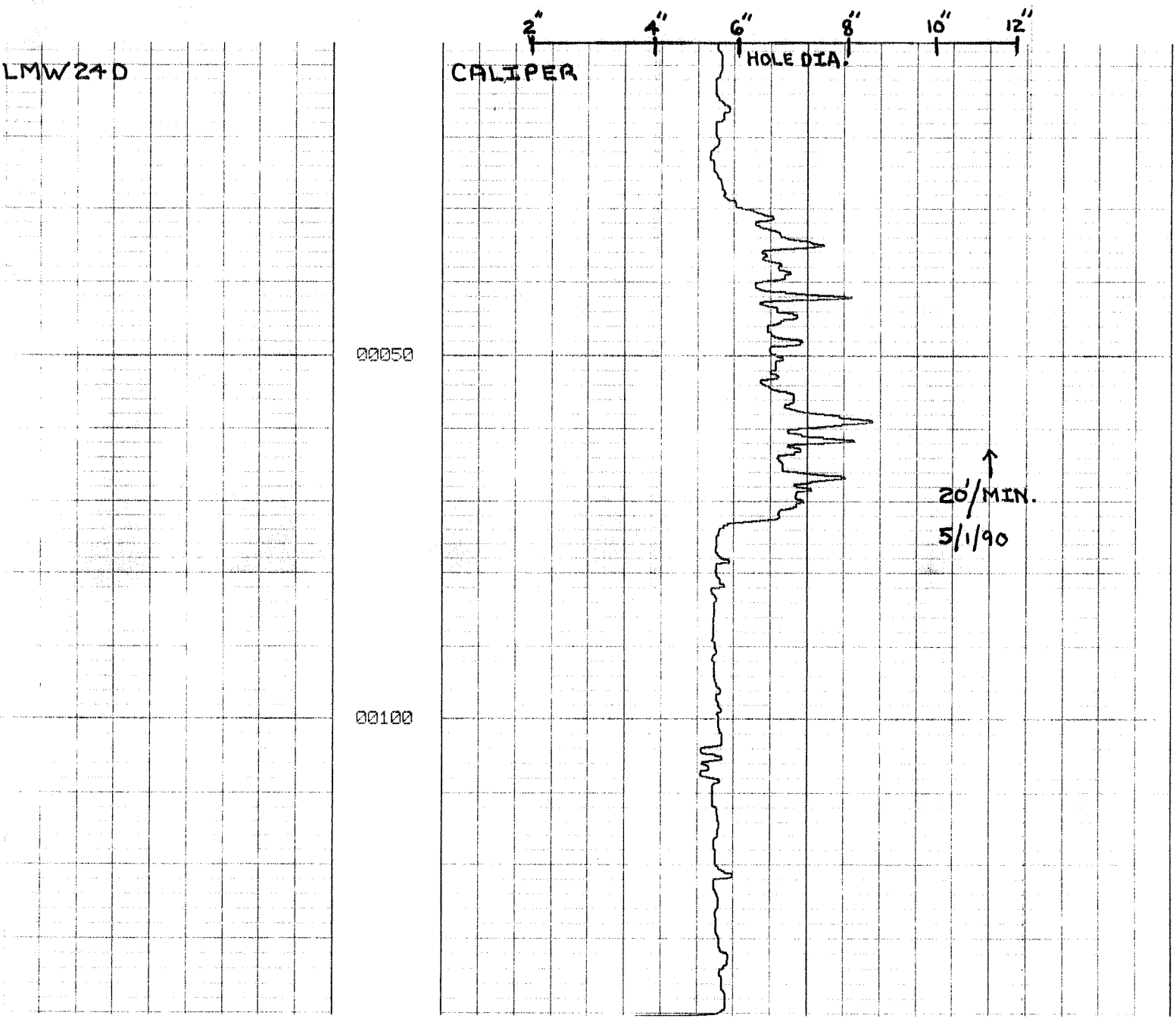
Proposed well depth for Pilot hole

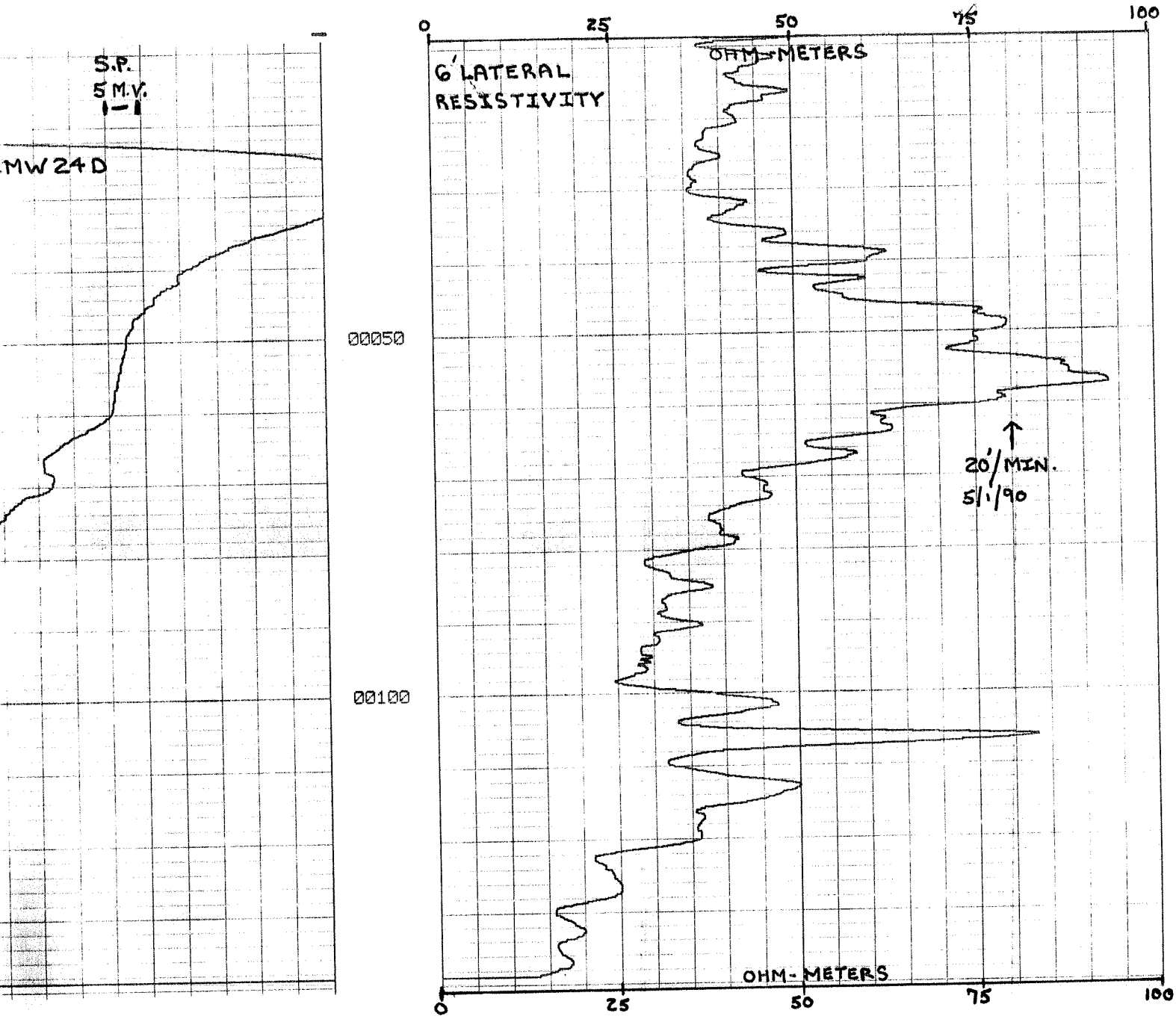
≈ 160'

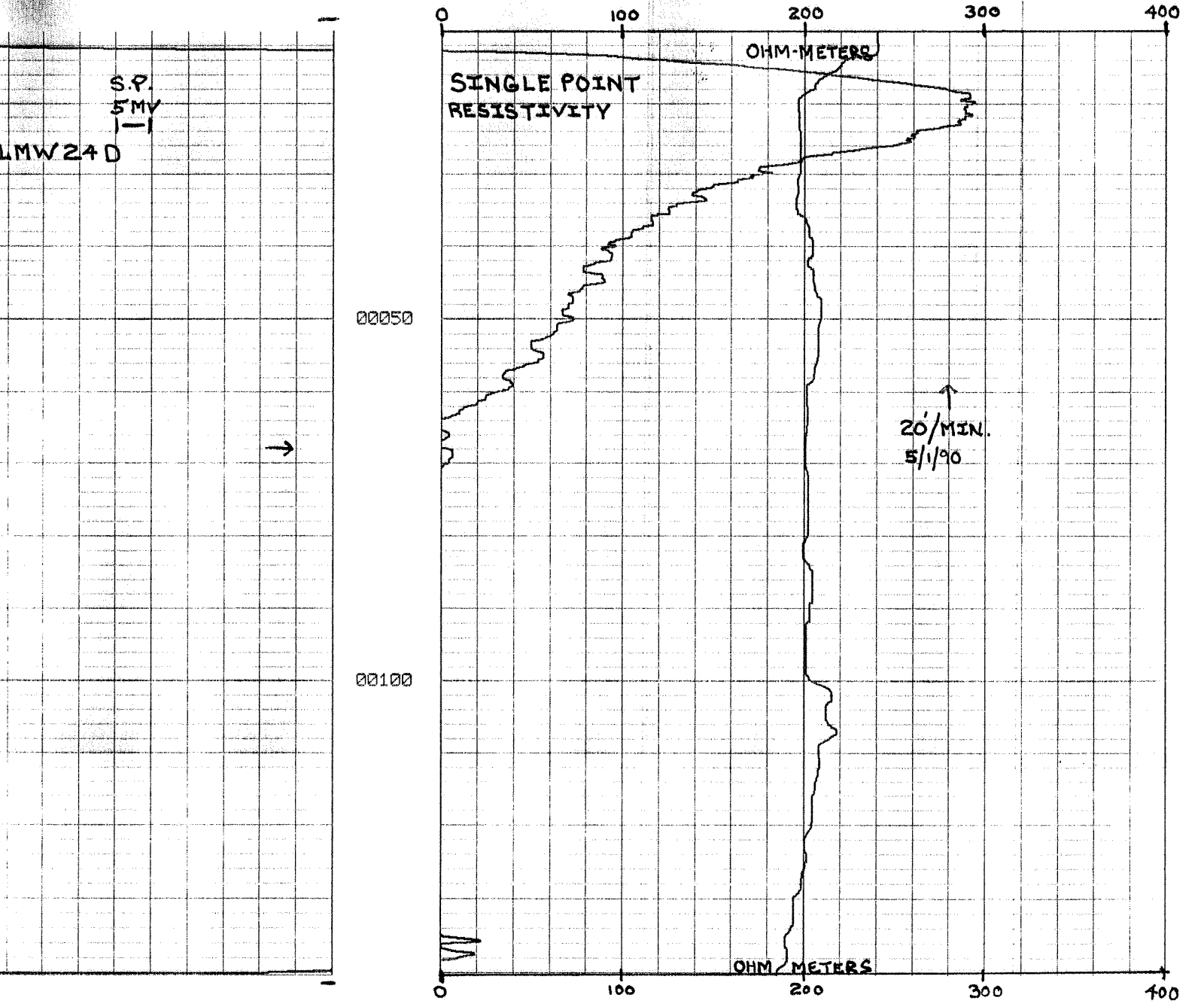
Well will be screened shallower than this. Well will be 2" PVC w/ max 10' of screen. I dont know how much casing


M.V.
5MV
1-1
S.P.
LMW240
00050
00100
0
100
200
300
400
OHM-METERS
16"
64"
16" & 64" NORMAL
RESISTIVITY
20'/MIN.
5/1/90
OHM-METERS
0
100
200
300
400


LMW24D
00050
00100
0
25
50
75
100
C.P.S.
GAMMA
100C.P.S.
T.C.-2
20'/MIN.
5/1/90
C.P.S.
0
25
50
75
100


LMW24D
CALIPER
2"
4"
6"
8"
10"
12"
HOLE DIA.
00050
00100
20'/MIN.
5/1/90


S.P.
5 M.V.
MW 24 D
00050
00100
0
25
50
75
100
OHM-METERS
6' LATERAL
RESISTIVITY
20'/MIN.
5/1/90
OHM-METERS
0
25
50
75
100


S.P.
5 MV
LMW 24 D
00050
00100
0
100
200
300
400
OHM-METERS
SINGLE POINT
RESISTIVITY
20'/MIN.
5/1/90
OHM METERS
0
100
200
300
400

WELL CUTTINGS PROCESSING FORM

SFWMD ID NO.: 5 WELL CONST. PERMIT NO.: _____

WELL NAME: SLMW24D GEOPHY. LOG AVAIL. ✓ Yes ____ No

COUNTY St Lucie SFWMD GEOPHY.# _____

LOCATION: SE 1/4 of SW 1/4 of NE 1/4 of Sec. 14 Twp. 34S Rge. 39E

Latitude 27° 31' 18" Longitude 80° 24' 17"

Planar X _____ Planar Y _____

DRILLER: SFWMD DATE DRILLED 5/1/90

DEPTH (ft) 142' ELEVATION (NGVD) _____ ( ) TOPO ( ) SURVEY

NO. OF SAMPLES _____ NO. OF SPLITS 1 DATE SENT _____

SENT TO: ( ) BOG ( ) USGS _____ ( ) OTHER _____

WATER SAMPLE: CHLORIDES (mg/l) _____
LAB SAMPLE # _____

HYDRAULIC DATA AVAILABLE:
SPECIFIC CAPACITY ____ Yes ____ No
PUMP TEST ____ Yes ____ No

COMPLETION INFO: ( ) PLUGGED ( ) TEST (X) MONITOR ( ) PRODUCTION

DRILLING METHOD: ( ) CABLE TOOL ( ) JET ( ) AUGER
(X) ROTARY: (X) Mud [ ] Air [ ] Reverse [ ] Dual Wall

CASING: TYPE: (✓) PVC ( ) GALV. ( ) STEEL
DIAMETER: 2" INTERVAL: 0-50'; 55'-140'

SCREEN: TYPE: (✓) PVC ( ) GALV. ( ) STEEL
DIAMETER: 2" INTERVAL: 50'-55'

GEOLOGIST DESCRIPTION: ( ) NO (✓) YES _____

COMMENTS: _____

South Florida Water Management District

P.O. Box 24680 • 3301 Gun Club Road • West Palm Beach, FL 33416-4680 • (407) 686-8800 • FL WATS 1-800-432-2045

RES-06-02-02

April 23, 1990

Dr. Paul Phillips
Associate Superintendent of Administrative Services
School Board of St. Lucie County
2909 Delaware Ave.
Fort Pierce, FL 34947

Dear Dr. Phillips:

Enclosed are two copies of the fully executed Right of Entry/Well Construction agreement between the South Florida Water Management District and the School Board of St. Lucie County. Thank you for your help in expediting the approval of the District's request to test the aquifer at the Lakewood Park Elementary School. I will notify Principal Dickerson prior to any work commencing at the site and will coordinate well installation and testing schedules with him.

Sincerely,

Don G. J. Padgett

Don G. J. Padgett
Staff Hydrogeologist
Department of Research and Evaluation

DP/hm
Enclosures

c: Herbert L Dickerson
Principal, Lakewood Park Elementary
7800 Indrio Road
Fort Pierce, FL 34951

bc: P. Millar
L Wedderburn

MEMORANDUM

TO: Marty Braun, Tony Lubrano, Pete Dauenhauer

FROM: Don Padgett

DATE: 4/27/90

SUBJECT: Proposed drilling and logging activities at the Lakewood Park Elementary School in ST. Lucie County

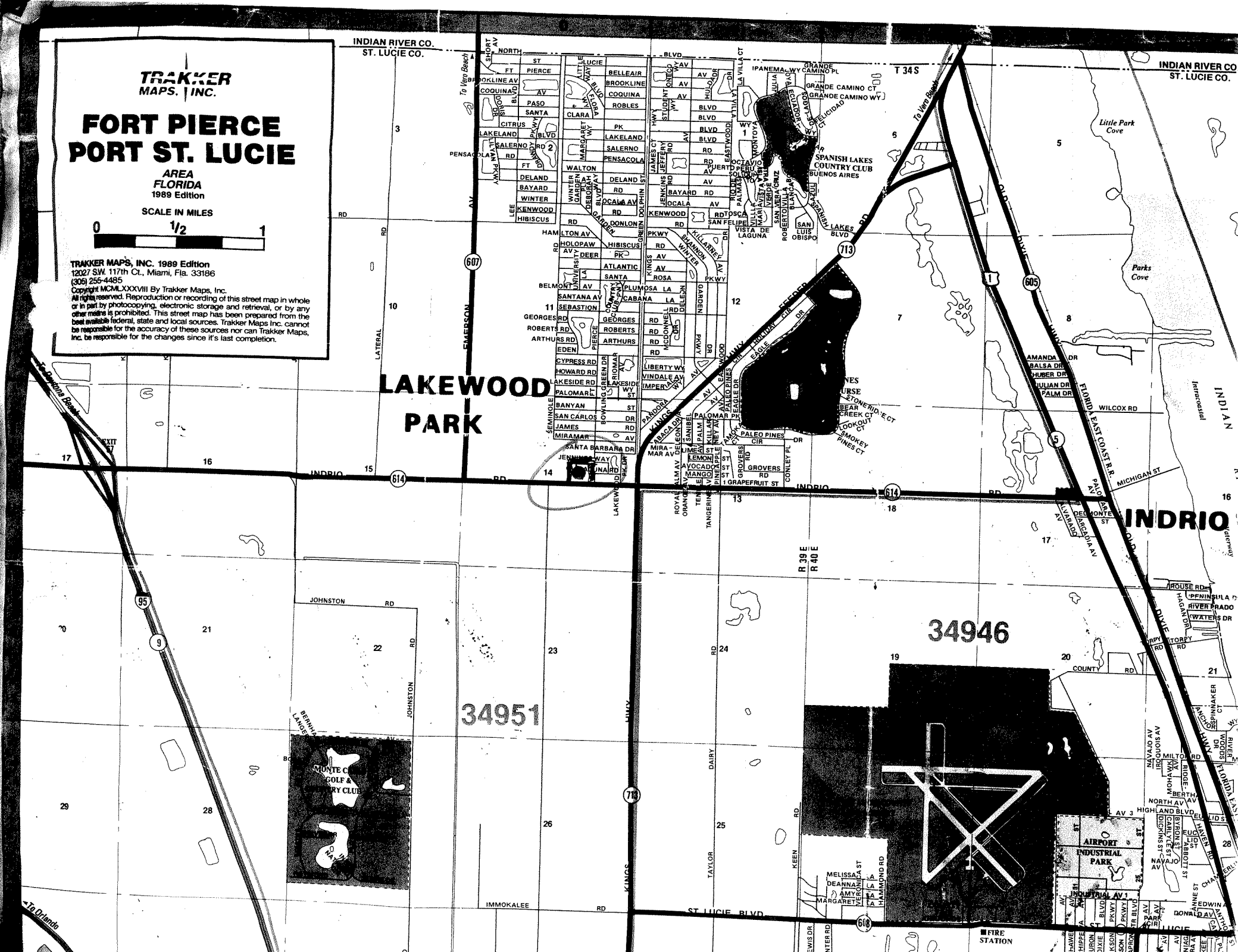
Here is a map showing where the school site is and approximately where the pilot hole will go. I will stake the exact location on Monday or Tuesday before we mobilize to the site.

Tony has proposed we drill the pilot hole on Wednesday, May 2. The hole will be relatively shallow (< 160') so we will need the logger there probably by about noon. I will call from the site that morning to confirm this. I have coordinated Pete's availability for logging with David Butler, however we will need to help Pete at the site as he will probably not have an assistant. I will need a full suite of logs run excluding the radioactive logs.

If there is a good producing zone in the pilot hole this well will be completed as a monitor well and the site will be developed as an APT site. I will complete the APT well designs and spacing based on what we find in the pilot hole.

If there is not a good producing zone in the pilot hole then the well will be completed as a monitor well and I will need a shallow water table monitor well installed next to it. That will then complete our activities at that site.

We will need to rope off or tape off the perimeter of the site with orange traffic cones or stakes and orange survey tape. The rig mast must be down when we leave in the evening and all equipment must be stored at the field station on the weekends and the mud pits covered. I know that is a pain but the school is very concerned about safety and so are we.


TRAKKER MAPS, INC.
FORT PIERCE
PORT ST. LUCIE
AREA
FLORIDA
1989 Edition
SCALE IN MILES
0 1/2 1
TRAKKER MAPS, INC. 1989 Edition
12027 S.W. 117th Ct., Miami, Fla. 33186
(305) 255-4485
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INDIAN RIVER CO.
ST. LUCIE CO.
LAKEWOOD PARK
INDRIO
34951
34946
SPANISH LAKES COUNTRY CLUB
AIRPORT INDUSTRIAL PARK
FIRE STATION
To Vero Beach
To Orlando
To Sebastian Beach
FLORIDA EAST COAST R.R.
Little Park Cove
Parks Cove
T 34 S
R 39 E
R 40 E


Lakewood
Park
Elementary
Additional test wells
(contingent upon monitor
well data)
Proposed monitor wells

Protecting South Florida's Water Resources for 40 Years
1949-1989

Padgett

South Florida Water Management District

P.O. Box 24680 • 3301 Gun Club Road • West Palm Beach, FL 33416-4680 • (407) 686-8800 • FL WATS 1-800-432-2045

March 5, 1990

Herbert L. Dickerson
Principal, Lakewood Park Elementary
7800 Indrio Road
Fort Pierce, FL 34951

Dear Mr. Dickerson:

Thank you for meeting with me on Thursday, February 22 to discuss the possibility of allowing the South Florida Water Management District (SFWMD) to install water level monitor wells and to conduct an aquifer performance test in the southwest corner of the Lakewood Park Elementary School property. Attached is an aerial photograph of the site showing the location at which we would like to install the wells necessary for monitoring and testing. The information we would gather from these wells would greatly assist us in our study of the Surficial Aquifer System in St. Lucie County.

I am including a Right of Entry / Well Construction Agreement form which gives the SFWMD permission to construct and monitor the wells at the described locations and conduct an aquifer performance test on the property. This agreement also ensures the property and well sites will be restored to the condition they were in immediately prior to the construction of the wells and includes a "save and hold harmless" clause to protect the School Board from claims for damages or injuries.

The SFWMD expects to install a minimum of two monitor wells at the site. If these wells indicate the aquifer is productive, then we would like to perform a more detail aquifer performance test requiring the installation of up to five additional wells in the same area. Once all wells are installed, the test can be performed in less than one week. Once the test is complete, the SFWMD would like to keep two wells for future monitoring. The remaining wells will be abandoned in accordance with Florida Administrative Codes Rule 40E-3, at SFWMD expense.

Although the results of this test will have significant influence on the protection and development of the ground water resources in the County, our primary concern in any construction activity is one of safety. In addition to supervising operations and providing site security during school hours, SFWMD staff will insure that no equipment will be left at the site over a weekend and all equipment will be secured at the site during the evenings and at night during the work week. In all cases, the SFWMD will notify you several days prior to any construction or testing operation, and will adjust these proposed schedules should they be in conflict with any school activity.

If you decide to allow the SFWMD to conduct these activities on the property, the attached form must be signed by an authorized representative from the School Board and returned to me. The form will be countersigned by the appropriate SFWMD representative, and a copy will be sent to you for your records.

I thank you in advance for your assistance with our study, and I will contact you Wednesday, March 14, to inquire if you need additional information concerning any of the activities or agreements described above.

Sincerely,

Don G. J. Padgett

Don G. J. Padgett
Staff Hydrogeologist
Hydrogeology Division
Department of Research and Evaluation

DP/hm
Attachments

c: Dr. Paul Phillips
bc: L. Wedderburn

FORM 0428
6/86

RIGHT OF ENTRY AGREEMENT/WELL CONSTRUCTION

The SOUTH FLORIDA WATER MANAGEMENT DISTRICT and/or _____ and the agents, employees or assigns of each, (Permittees) are hereby granted the right to enter upon property owned by School Board of St. Lucie County (owner), and described herein, for the following purposes:

1. To construct water well(s) for the purpose of gathering lithologic data.
2. To conduct aquifer performance and step drawdown test(s) to determine water availability.
3. To collect geophysical logs on selected well(s).
4. To periodically be allowed access to the well(s) for the purpose of monitoring water levels and/or water quality sampling.

Such equipment as may be needed to accomplish the above purposes may be brought upon, over and across the property, which is described as follows:

The southwest corner of 19.7 acres located in the SE ¼ of the SW ¼ of the NE ¼ of Section 14, Township 34 South, Range 39E, St. Lucie County, Florida.

The permittees, and each of them, warrant to the undersigned that upon completion of the above purposes, the property will be left in, or restored to, the same condition as it was when the permittees or their contractor(s) first entered upon the land to begin their work.

The permittees, and each of them, separately and severally, to the extent permitted by law, shall save and hold harmless the undersigned owner from claims for damages or injury caused by the permittees, their agents, servants, employees, or contractors, during the time this permit for access and use is in effect.

SCHOOL BOARD OF ST. LUCIE COUNTY

By Judi Miller
Judi Miller, OWNER Chairman

Date: March 27, 1990

Executed by owner in presence of:

David DeRuzzo
David DeRuzzo, Superintendent

Christine L. Harrison

COUNTERSIGNED BY PERMITTEE(s)

for SFWMD

Date: 4/12/90

for

Date:

MW #4

WELL COMPLETION REPORT

FORM 0124
Rev. 4/85

WELL PERMIT NO. _____

Owner	Address	City	State	Zip
St Lucie County School Board	2909 Delaware Ave	Ft. Pierce	FL	34950

Contractor's Signature	License No.	Completion Date	Casing Depth	Total Depth	Well #
D E Webb	2145	12/11/90	10	15	1" OBS

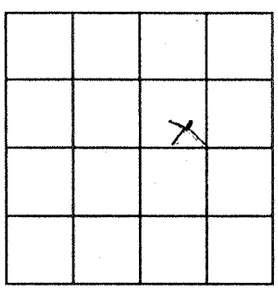
Driller's Name: D E WEBB Registration No.: _____

TYPE OF WORK: Construct (X) Repair ( ) Abandon ( )
WELL USE: Domestic Well ( ) Public ( ) Monitor (X) Test ( )
Irrigation ( ) Fire Well ( ) Other OBSERVATION
METHOD: Rotary with MUD ( ) or Air ( ), Cable Tool ( ), Jet ( )
Casing Driven ( ), Other Auger
STATIC WATER LEVEL 4 ft. below top of casing
PUMPING WATER LEVEL _____ Ft. after _____ Hrs. at _____ GPM
PUMP SIZE _____ H.P. CAPACITY _____ GPM
PUMP TYPE _____ INTAKE DEPTH _____ From top of ground

LOCATION
Located Near Lakewood Park Elementary School
County _____

¼	¼	Section	Township	Range
		14	34S	39E

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	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.
1	2	10	0	2½	Sand Br. fine
9'	2	15			
			2½	4½	Sand Dk. br silty Hard pan
			4½	5½	Sandy & silty white
			5½	13	Sandy & silty gray fi sand w/ shell frags
Number of bags					
1					

Casing: Black Steel ( ) Galv. ( ) PVC (X) Fiberglass ( )
Screen: Type PVC Slot size .020
Screened from 10 (ft.) to 15 (ft.)
Type of grout with % additives Portland
Water: Clear ( ) Colored (X) Sulphur ( ) Salty ( ) Iron ( )
Conductivity _____ Chlorides _____ mg/l

File: LWPES STP
GW Monitoring

FORM RP-59
July 1979

WELL DRILLER'S LOG

(1)

SOUTH FLORIDA WATER MANAGEMENT DISTRICT

PROJECT STL WELL NO. SLMW24D DATE 5/1/90

Drilling mud rotary, bentonite mud w/ some E-Z mud polymer, 5 7/8" drag bit.

TIME ~~DEPTH~~	DESCRIPTION – ROCK TYPE, COLOR, HARDNESS, OTHER
0830	On Site, Drillers filling up barrels w/ 150 gal of water. Cuttings collected w/ wire basket.
0848	From mud pit. 0-1.5' Organic black-grey soil overlying grey quartz sand. Semi-consolidated, dark brown sand layer at 1.5'.
0912	Drilling @ 3' brown, clayey sand turning to light grey with depth.
	@6' white clayey sand with small amount of broken shell
	@9' clayey sand with some semiconsolidated sand and trace of shell
0928	@10' grey-green clay (50%) + sand (50%)
	@12' white shell (80%) with sandy clay (20%)
	@14' shell content decreasing to (50%)
0947	@18' as above with coarser shell; less clay and 50% sand
	@19' brown grey muddy clayey sand with a small amount of shell
0948	KO @ 22'; as above; add 20' DP #1 with stabilizers; OS = 47'
	@23' Coarse shell (70%) interbedded with muddy, sandy, clay.
	@31' as above with some semiconsolidated sand.
	@32' fine shell hash and sand
	@33' sand – no sample
	@35' blue-grey shell hash (Similar to formation at STLAPT1)
1003	KO @ 42' blue-grey shell hash with sandstone and limestone worn pebbles (Probable beach deposit). Formation took a small amount (50 gal) of fluid
	Add 20' DP #2. OS = 67'
	@50' as above; hard streaks from 48'-50'
	@52' Sandy Limestone and shell (80%)
	@58' Shell hash (70%), broken + small fragments, and Limestone, fine grain
	@61' as above with 10% muddy, silty, clay

FORM RP-59
July 1979

WELL DRILLER'S LOG

SOUTH FLORIDA WATER MANAGEMENT DISTRICT

PROJECT STL WELL NO. SLMW24D DATE 5/1/90

TIME ~~DEPTH~~	DESCRIPTION – ROCK TYPE, COLOR, HARDNESS, OTHER
1029	KD @ 62'. dark grey shell hash with limestone pebbles and small amount of muddy, silty clay. Formation took ≤ 50 gallons of fluid. Formation looks like it ~~shd~~ should be permeable but it is not taking a lot of fluid during drilling
1035	Add 20' DP #3; DS=87'; Mixing mud and adding 50 gallons of water.
	@ 62' grey fine shell hash (80%) with limestone (20%)
	@ 65' light brown ~~shell~~ shell (large + whole) with shell hash and limestone (pebbles + beds).
	@ 68' as above with 10% sandy clay.
	@ 75' as above with lot of clay (50%)
1103	@ 78' sandy clay content increasing
	@ 80' Soft, grey, sandy, muddy limestone with 10% shell.
1105	KD @ 82' as above. Add 20' DP #4, DS=107'
	82'-90' interbedded bleached shell, grey limey sand clay and sandy clayey granular soft limestone. Adding polymer to mud.
	@ 90' soft grannular limestone with layers of sandy clay and large thick black to brown shell pieces.
1124	@ 95' grey-green soft clayey grannular limestone with clay layers
	@ 97' grey, sandy, grannular clay [redacted].
1133	KD @ 102' grey, clayey, silty, sandy biosparite with shell molds and casts. Add 20' DP #5, DS=127'
1145	@ 105' as above interbedded with granular sandy clay
	@ 107' grannular biosparite interbedded with shell (50%) and clay.
	@ 112' brownish green grannular limestone and 10-15% clay very phosphatic, phosphate is very fine grain
	@ 115' as above with increase in clayey silt (15%)
1159	@ 117' as above with increase in clayey silt (30%-50%)
	@ 120' as above with >50% clayey silt
1204	KD @ 122' brownish green sandy, phosphatic, muddy, silt.

FORM RP-59
July 1979

WELL DRILLER'S LOG

SOUTH FLORIDA WATER MANAGEMENT DISTRICT

PROJECT STL WELL NO. SLMW24D DATE 5/1/90

~~Time~~ DEPTH	DESCRIPTION – ROCK TYPE, COLOR, HARDNESS, OTHER
1209	Add 20' DP #6; DS=147'
1216	@125' as above with ≈80% clayey silt. phosphate is both very fine and pebble. fossiliferous, bone + shark teeth
1219	@130' as above clay is greener but not very cohesive, possibly due to polymers in mud.
1224	@142' KP; clayey phosphatic silt, a little more cohesive TD 142' Circulating
1240	Pete Dauenhauer on site with geophysical logger. Pete runs the following geophysical logs: SP, Single point, long + short normal, 6' lateral resistivity logs, Gamma, Caliper.
1530	Well completed screened from 50-55'. w/5 bags sand Developed well with air till water began to clear. Pumped well @ maximum 3 gallons per minute. Water was cloudy with fine shell and sand. Developed well w/ air for next hour while drillers began site cleanup.
1630	Don off site. Drillers will finish cementing well and demobilize from site on 5/2/90.

Lakewood Park Elementary School STP Groundwater Monitoring ($195/Sampling by Envirometrics)

Quarterly Monitoring Results

Sampling Date	Well No. 1 - Compliance (east)					Well No. 2 - Compliance (south)					Well No. 3 - Background				
	Fecal Colif.	BOD_5	Cl^-	TDS	Spec. Cond.	Fecal Colif.	BOD_5	Cl^-	TDS	Spec. Cond.	Fecal Colif.	BOD_5	Cl^-	TDS	Spec. Condi.
5/18/88	<2	1.8	16	428	610	<2	<1.0	6.0	598	760	<2	1.2	22	388	540
7/5/88	4	1.8	62	370	800	<2	2.2	11.0	492	785	<2	1.2	26	464	600
10/6/88	1	2.2	27	504	560	<1	2.2	8.0	676	780	<1	2.4	35	478	670
1/4/89	<1	<1	28	412	600	<1	1.0	11.0	606	795	<1	<1	24	386	520
4/10/89	<2	<1	20	406	500	<2	<1	8.0	556	610	<1	<1	25	334	410
7/8/89	7/8: 27 7/13: <2	<1	27	376	705	<2	<1	6.0	588	880	+2	<1	24	364	690
10/9/89	<1	<1	375	1372	1560	<1	<1	4.0	566	730	<1	<1	27	395	595
1/25/90	<10	<1	312	1104	1526	<10	<1	14	612	763	<10	<1	28	442	654

Sampling Date	Fecal Colif.	NH_3-N	NO_2+NO_3	Chlorides	TDS	pH
4/10/90	<4	2.4	<.07	5	630	6.75
7/6/90	<1	11.1	0.36	3	600	6.6
8/15/90						
9/19/90						
10/2/90	8/<1*	0.285	<.02	80	462	6.85
11/20/90						

Sampling Date	Well No. 1 - Compliance (east)					Well No. 2 - Compliance (south)					Well No. 3 - Background				
	Fecal Colif.	BOD_5	Cl^-	TDS	Spec. Cond.	Fecal Colif.	BOD_5	Cl^-	TDS	Spec. Cond.	Fecal Colif.	BOD_5	Cl^-	TDS	Spec. Condi.
4/10/90															
7/6/90			1250	3732											
8/15/90			1720	5310											
9/19/90			1635	4942											
10/2/90			1530	4326											
11/20/90			1290	3738											

* Resampled on 10/26/90

Water Level Measurements for Monitor Wells at Lakewood Park Elementary School, St. Lucie Co.

Sampling Date	MW*1	MW*2	MW*3	MW*4
5/18/88	6.17	5.58	4.50	—
7/5/88	4.33	6.00	4.25	—
10/6/88	4.58	5.67	6.25	—
1/4/89	6.00	5.67	4.75	—
4/10/89	8.00	5.83	4.58	—
7/8/89	6.58	7.42	5.92	—
10/9/89	5.83	5.67	4.58	—
1/25/90	6.17	5.75	4.42	—
4/10/90	—	4.00	—	—
7/6/90	—	—	—	—
8/15/90	—	—	—	—
9/19/90	—	—	—	—
10/2/90	—	—	—	—
11/20/90	—	—	—	—
12/12/90	6.06	5.63	4.06	4.27

(BT) 12/21/90

Determination of Water Table Gradient at Lakewood Park Elementary School - 12/12/90

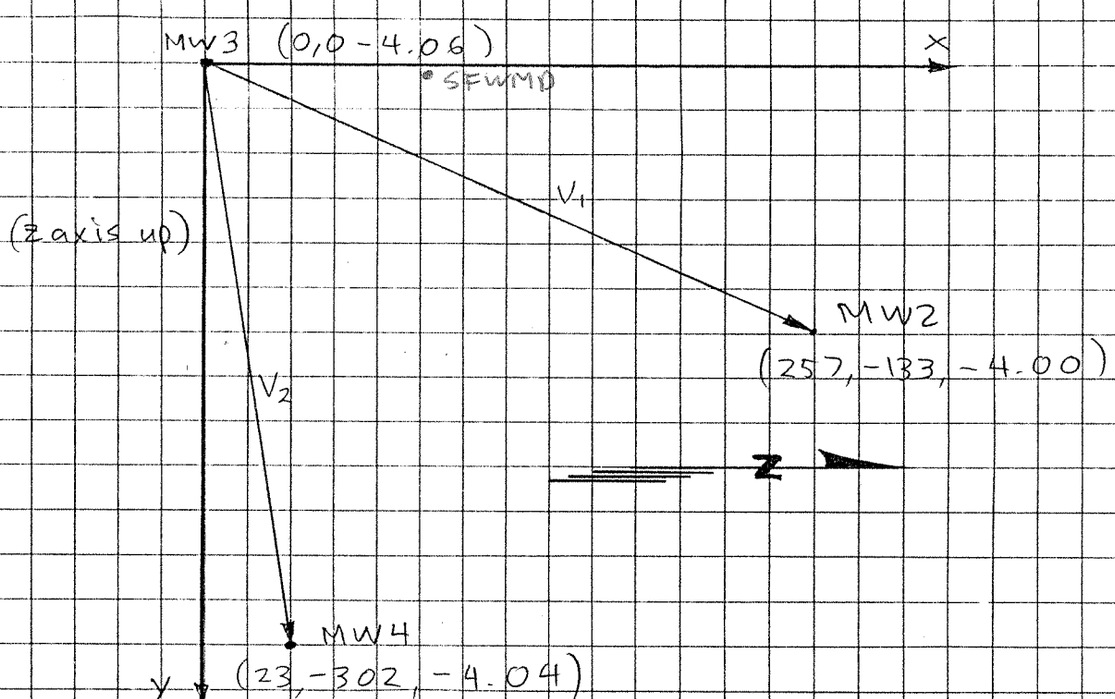
- Use monitor well Nos. 2, 3 and 4

- Relative water levels (12/12/90):

Well No.	Rod @ Top of Casing, ft.	Casing Top Relative Elev., ft *	Depth, Casing Top to Water Level, ft	Water Level Relative Elev., ft *	Casing Top Dist. Below Grade, ft
1	2.70	2.27	6.06	-3.79	4
2	3.34	1.63	5.63	-4.00	4.5
3	4.97	0.06	4.06	-4.06	4
4	4.74	0.23	4.27	-4.04	3
SFWMD	4.70	0.27	4.38	-4.11	0

* Reference elevation: MW3 casing top = 0.0'

- Define water table plane by 3 points at water table surface for MW2, MW3 and MW4:



- Groundwater gradient direction can be determined as (x, y) component direction of $\overline{V}_1 \times \overline{V}_2$ cross product, which is normal vector for plane containing $\overline{V}_1$ & $\overline{V}_2$:

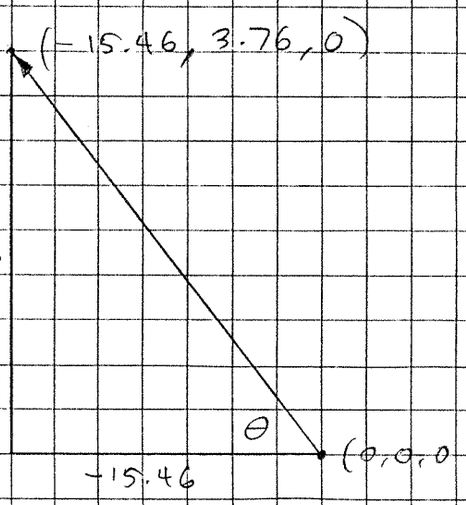
$$\overline{V}_1 = [257-0, -133-0, -4-(-4.06)] = (257, -133, 0.06)$$

$$\overline{V}_2 = [23-0, -302-0, -4.04-(-4.06)] = (23, -302, 0.02)$$

(BT) 12/12/90

$$V_1 \times V_2 = \begin{vmatrix} i & 257 & 23 \\ j & -133 & -302 \\ k & 0.06 & 0.02 \end{vmatrix}$$

$$= \bar{i}\left[(-133)(0.02) - (-302)(0.06)\right]$$
$$-\bar{j}\left[(257)(0.02) - (23)(0.06)\right]$$
$$+\bar{k}\left[(257)(-302) - (23)(-133)\right]$$
$$= -15.46\,\bar{i} + 3.76\,\bar{j} - 74,555\,\bar{k}$$



$$\text{Tan}\,\theta = \frac{3.76}{15.46} = 0.243 \Rightarrow \theta = 13.7^\circ$$

Bearing from north (0°) would be $(180 + 13.7) = \underline{\underline{194^\circ}}$

- Determine slope of water table. Slope of plane established by the 3 monitor well levels will be equal to the angle between the plane normal vector (determined above) and the z-axis:

  - z axis = vector (0, 0, 1)
  - normal vector = (-15.46, 3.76, -74,555)
  - angle between two vectors:

$$\phi = \arccos\left(\frac{X_1 X_2 + Y_1 Y_2 + Z_1 Z_2}{|V_1||V_2|}\right)$$

$$\Rightarrow \cos\phi = \frac{\left[0 + 0 + (-74,555)\right]}{\sqrt{-15.46^2 + 3.76^2 + (-74,555)^2} \times \sqrt{1^2}} = 0.999999977$$

$$\Rightarrow \phi = 0.012^\circ$$

slope in ft/ft = $\tan\phi = 0.000213$ ft/ft