REPORT ON INVESTIGATIONS CONDUCTED ON FIVE WELLS AT THE GATOR SLOUGH CITRUS DEVELOPMENT PROJECT SECTION 22, T45S, R28E, HENDRY COUNTY

PREPARED FOR

AGRICULTURAL MANAGEMENT SERVICES INC.

PUNTA GORDA, FLORIDA

BY

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FORT MYERS, FLORIDA

OCTOBER 1985

FC20063.A0

INTRODUCTION

During the period from October 1981 to April 1982, five water supply wells were drilled in Section 22. These wells were 8-inch diameter and intended to supply irrigation water for a new citrus grove to be constructed on the site. The five irrigation wells were constructed with both screened and open-hole completion. In addition, a sixth well (4-inch) was constructed to provide domestic water supply for a house to the north of the planned grove. This well was constructed with only open hole completion. The significance of the house well will be discussed below.

After the wells were constructed, the permittability of their dual completion was questioned by the water management district. The apparent problem with the wells' construction lies with the possibility that the wells may interconnect two distinct zones of significantly different water qualities.

Chapter 40E-3.512(2) which states "For wells which penetrate multiple aquifers or zones, the well shall be completed so as to prevent cross contamination of different aquifers or zones if significantly different water quality exists between these aquifers or zones and to prevent leakage of water from one aquifer or zone to another aquifer or zone."

The applicability of this rule to the five irrigation wells in Section 22 depends upon the following questions:

1. Is the well completed into more than one aquifer or zone?
2. If two zones exist, do they have significantly different water qualities?
3. Does the construction of the well permit cross-contamination of the aquifers or zones?

This report presents the results of CH2M HILL's investigation into the applicability of the above rule to the wells in question. The work consisted of investigation into the records of the well, interviewing the driller and a program of geophysical logging and sampling to verify reported facts and collect new data.

DATA REVIEW

Review of the drillers completion report provided construction information and a lithologic description for each well. The determination of which completion report corresponded to which well, however, could not be completely resolved. For this reason, caliper and gamma ray logs were included in the logging program and the identification of each well was subsequently verified. Figure 1 shows the locations of the project and wells.

The driller's logs show the top of the first consolidated limestone at about 200 feet. Above this rock is a layer of greenish sandy clay. The thickness of this layer varies from 2 feet in Well No 1. to 19 feet in Well No. 4. No distinct clay layer was listed for Well 5 and may be absent at that site. Overlying this layer are sequences of sands and gravel. The thickness of these sequences varies from about 100 to 150 feet and their grain size apparently varies from site to site. Some interpretation is necessary with how these sediments are described. These sequences are overlain by clay of variable thickness and finally the surficial sand. Lithologic descriptions reported by the driller are attached to this report (see Appendix A). Figure 2 graphically presents this information and attempts to correlate the sediments found at the five locations. Figure 3 shows the correlation of the gamma ray "signatures" and indicates by their similarity that some of the variability reported in the sand and gravel may not be significant.

Construction information listed on the completion reports is also included in Figure 1 and listed by Table 1, below. All wells were constructed by installing an 8-inch casing and screen assembly into a drilled hole, cementing from the end of the casing up to the screened section, and installing gravel to the surface. Table 2, which follows, gives the reported water quality of the wells upon completion and during later testing by AMS.

Table 1. Well Construction Details

Well	Permit No.	Date Drilled	Screen Interval (ft)	Casing Depth (ft)	Total Depth (ft)
1	936	10/22/81	161-201	211	255
2	1043	3/26/82	136-176	214	245
3	1049	4/1/82	128-148	208	245
4	1035	3/12/82	140-190	202	245
5	1022	2/12/82	141-181	202	240
House	1020	1/24/82	none	204	240

Source: Well Completion Reports

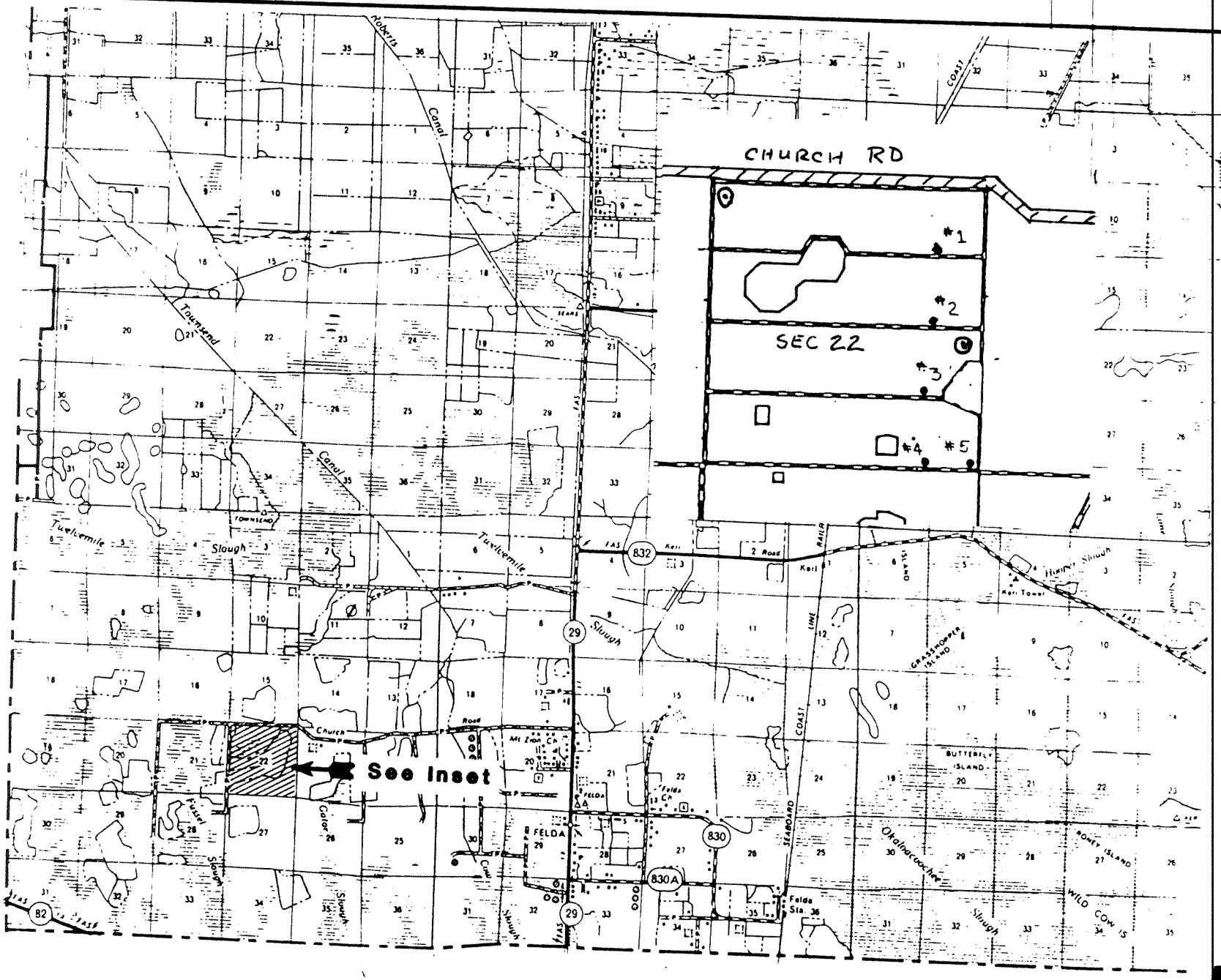


FIGURE 1 Well locations

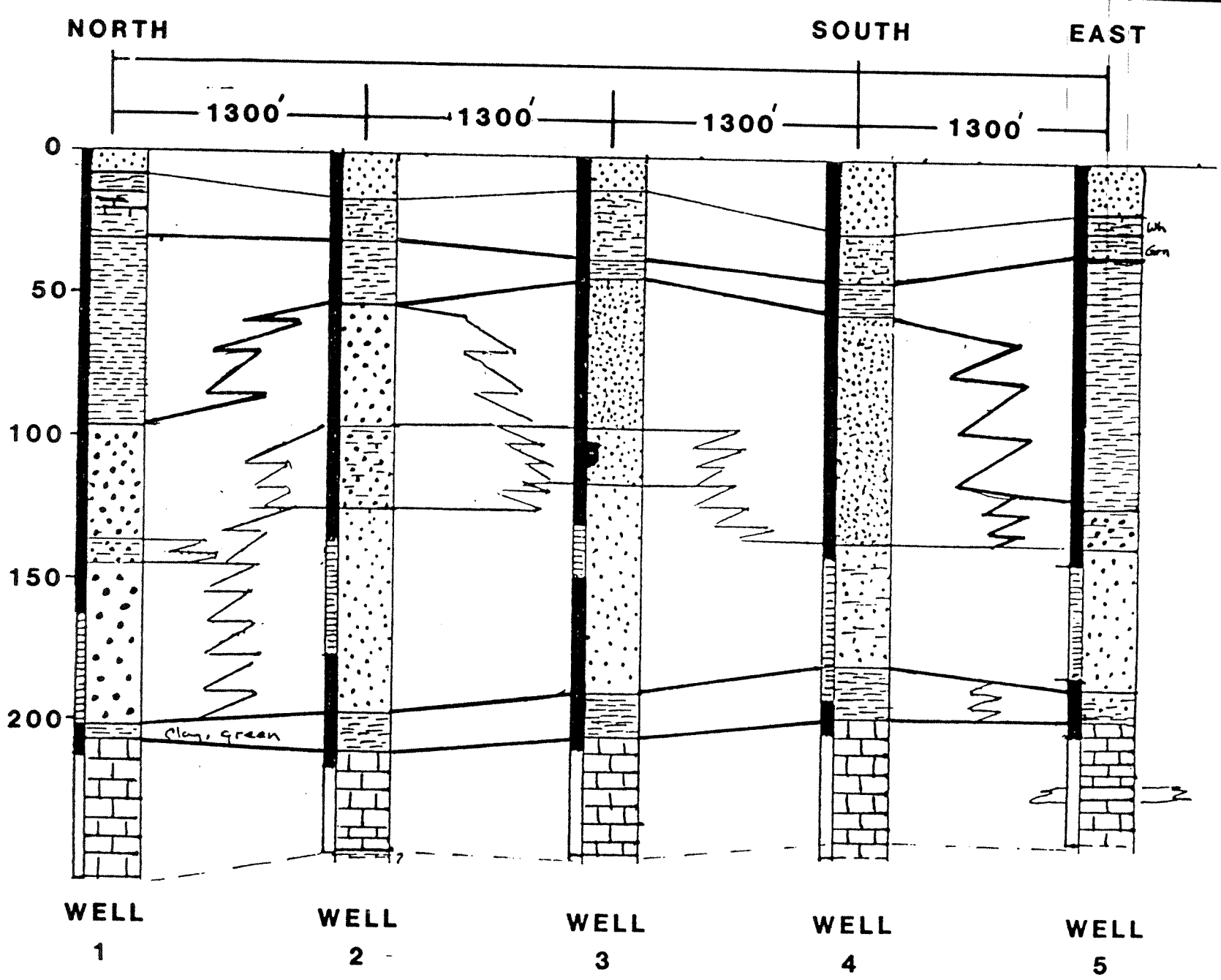


FIGURE 2 Lithologic cross-section

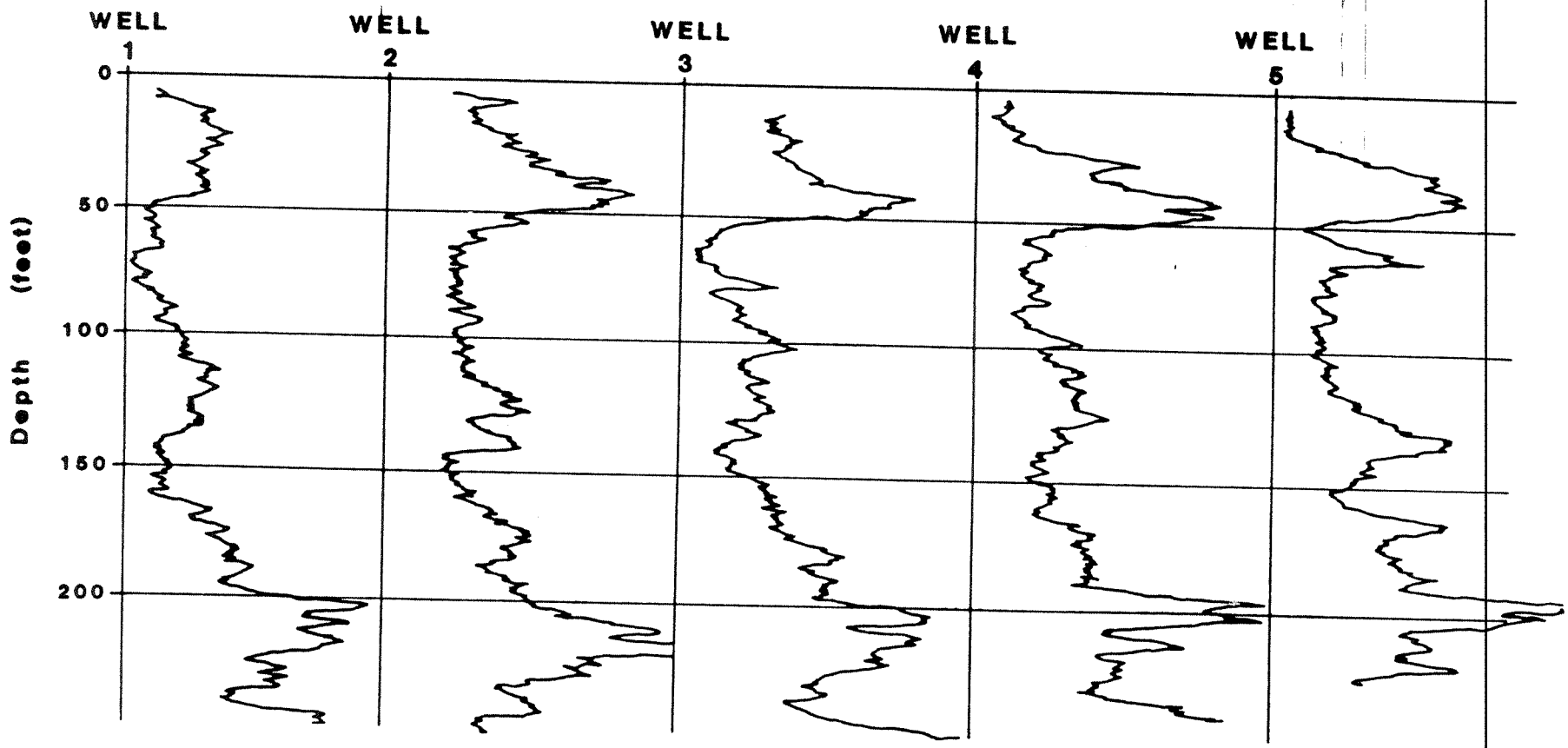


FIGURE 3 Gamma Log Correlation

Table 2. Initial Water Quality

Well	Date	Sodium Chloride (mg/l)	Sulfide (mg/l)	Hardness (mg/l) (as CaCO3)	Iron (mg/l)	Source
1	10/21/81	100	-	-	-	Driller
	7/85	150	0.7	223	0.8	AMS
2	3/26/82	200	-	-	-	Driller
	7/85	100	0.1	171	0.7	AMS
3	4/1/82	150	-	-	-	Driller
	7/85	150	ind	256	0.6	AMS
4	3/12/82	150	-	-	-	Driller
	7/85	150	0.0	205	0.8	AMS
5	2/12/82	100	-	-	-	Driller
	7/85	150	0.1	256	1.5	AMS
House	1/29/82	100	-	-	-	Driller

Note: The field kits used above for sodium chloride have a resolution of ± 50 mg/l.

Samples taken by the driller were obtained during development. Samples taken by AMS were obtained during later capacity testing. It is important to note that the sodium chloride levels in all wells remained essentially unchanged during this period.

FIELD INVESTIGATIONS

To collect sufficient data to determine whether or not the construction of the wells violated either the letter or the spirit of the rule above, a program of geophysical logging and testing was formulated. Table 3 below gives a summary of the logging and testing performed.

Table 3. Summary of Logging & Testing

Well	Log	Date	Depth
1	Gamma	9/19/85	251
	Caliper	9/19/85	250
	Tracer	9/19/85	180-190
	Fluid Velocity	9/20/85	251
	Depth Sample	9/20/85	208
2	Gamma	9/19/85	250
	Caliper	9/19/85	250
	Tracer	9/19/85	200-210
	Fluid Velocity	9/20/85	252
	Fl.Vel.(static)	9/19/85	252
	Depth Sample	9/20/85	210
3	Gamma	9/18/85	250
	Caliper	9/18/85	251
	Tracer	9/18/85	200-210
	Fluid Velocity	9/19/85	252
	Depth Sample	9/19/85	200
4	Gamma	9/18/85	243
	Caliper	9/18/85	243
	Temp. (static)	9/18/85	245
	Tracer	9/18/85	182-202
	Fluid Velocity	9/19/85	244
	Depth Sample	9/19/85	200
5	Gamma	9/18/85	227
	Caliper	9/18/85	227
	Tracer	9/18/85	185-205
	Fluid Velocity	9/18/85	227
	Depth Sample	9/18/85	180

Gamma Ray Logging

The gamma ray logs were run to assist in the correlation of the sediments from well to well and to assist in the identification of the wells. Gamma ray concentrations can show equivalency between strata even if their lithologic character varies.

Caliper Logging

Caliper logs were run on each well to verify their construction and identity. Such verification was necessary for properly conducting the brine tracer survey.

Brine Tracer Survey

The presence of measurable flow between the screened and open hole sections of each well would indicate hydraulic separation of the zones. In addition, knowledge of the amount and direction of any non-pumping flow is necessary to determine the extent a well must be pumped to obtain a valid water quality sample.

The tracer surveys were conducted by attaching a trace ejector to the geophysical logger cable above a fluid conductivity tool. The ejector was filled with saturated brine and opened by sending down the cable a weight or "messenger". The conductivity of the water near the tool was monitored by a time driven recorder. The results of these surveys are given in the following table. All velocities and flows given are in the "down" direction. Photocopies of the recorder output of the tracer surveys are attached to this report (see Appendix B).

Table 4. Tracer Survey Results

Well	Casing Diameter (in)	Ejector Depth (ft)	Tool Depth (ft)	Transit Time (min)	Water Velocity (ft/min)	Water Flow (gpm)
1	8	180	190	11.3	0.88	2.3
2	8	200	210	6.8	1.5	3.8
3	8	200	210	3.2	3.1	8.1
4	8	182	202	15.2	1.3	3.4
5	8	185	205	8.3	2.4	6.3
				Average flow		4.8

It can be seen that in all cases a downward flow exists from the screened sections to the open hole. The presence of this flow establishes that there is hydraulic separation of the sand and gravel zone from the underlying limestone.

The magnitude of the downward flow indicates that the wells would have to be pumped at a high rate for many days to obtain a valid sample from the limestone section. Assuming that the average down-hole flow throughout the year is one half the measured flow then in the 3.5 years which has elapsed since the wells were drilled approximately 4.5 MG has flowed from the sand intervals to the limestone section. Sampling the zone after only a short term pumping would yield only a

sample of the water recharged into the zone. Sampling of the sand and gravel section however should be valid.

Fluid Velocity Logging

After pumping the wells for several hours a fluid velocity log was run on each well. This log measures the relative production of each zone and permits the calculation of the quantity and quality of the water produced by the screened sections. This usage will be discussed below. While the flows indicated by the logs are valid only at the particular rate the well was pumped during the logging, they should indicate the relative productivity of the zones of each well. It should be pointed out that since the hydraulic head of the screened section is higher than the limestone, at low pumping rates, the wells should preferentially produce from the screened sections. The following table presents the analysis of selected station readings on these logs. Unless otherwise noted, all flows given are uphole. The static fluid velocity log on Well 2 was run to confirm the tracer survey results presented above.

Table 5. Fluid Velocity

Well	Depth (ft)	Velocity (ft/min)	Flow (gpm)	
1	147	83.2	216	Above screen
	204	81.0	211	Below screen 98%
2	125	83.2	216	Above screen
	205	77.8	202	Below screen 94%
	170	-1.9	-5.1	Static F.V.log - Downhole flow
3	118	87.5	227	Above screen
	209	50.2	131	Below screen 57%
4	133	65.3	170	Above screen
	208	10.8	28.1	Below screen 17%
5	133	75.6	197	Above screen
	201	39.4	102	Below screen 52%

It can be seen that Wells 1 and 2 produce almost entirely from the limestone section. Well 4, however, produces mostly from the screened section. In general, the limestone appears to be somewhat more productive than the sands.

Water Quality Sampling

After pumping each well for several hours, water quality samples were taken from the pump discharge and at a selected

depth between the screened and open hole portion of each well. The following table presents the results of this effort. Since all samples from above ("PUMPED") and below the screened portion of the well show essentially identical values, calculation of the quality of the water produced by the screened section using flow contribution values was trivial and not attempted.

Table 5. Water Quality Analysis.

Well	Station	Chlorides (mg/l)	Conductivity (umhos/cm)	Total Dissolved Solids (mg/l)	Sulfate (mg/l)	Iron (mg/l)
1	PUMP	45	621	194	11	0.31
	208'	47	625	204	12	0.28
2	PUMP	34	575	170	3.5	0.32
	210'	34	576	148	3.8	0.26
3	PUMP	42	588	170	7.1	0.33
	200'	43	578	152	7.3	0.07
4	PUMP	26	528	112	2.0	0.43
	200'	26	532	140	2.0	0.41
5	PUMP	26	530	120	2.1	1.06
	180'	27	540	148	2.3	1.09
House	PUMP	56	680	n/a	1.04	0.029

Note: Analysis for Wells 1 through 5 were performed by CH2M HILL. Analysis for the "house" well was performed by the GDU Peace River WTP laboratory.

The similarity between the water quality of the house well and the values calculated for the screened portion indicates that there is no substantial water quality difference between the upper sand and gravel sections and the underlying limestone.

CONCLUSIONS AND RECOMMENDATIONS

Examination of the data indicates that the sand and gravel strata are hydraulically distinct units at least in the study area. The separation of the two zones is probably caused by the clay layer at the top of the limestone and stratification of the sediments.

While the quality of the water in the limestone section could be sampled only at the house well (north of Well No. 1) comparison of the results of samples taken immediately after construction with recent samples clearly indicates no shift in the pumped water quality since construction. In addition, no substantial difference in the pumped quality between wells which produce mostly from the limestone and those which produce mostly from the sands was found. It is clear from the above that the limestone quality is not substantially different in the area from that of the overlying sands.

The wells as constructed, therefore, are not in violation of Section 40E-3 since the limestone section does not have significantly different water quality in it. In addition, the downward gradient which exists throughout the study area will prevent any cross-contamination through the well bore of the shallower sands by any brackish water which may exist in the area, but was undetected.

While the water quality of the limestone section at these five wells should allow for the use of the dual completion method, there can be no assurance that similar conditions exist outside the area. The areal extent of the separating clay layer is, at present, unknown. Where it is absent, completion of wells into both the sand and limestone sections should be allowed. Where it is present, however, dual completion is possible only if it can be shown, to the satisfaction of the District, that the water quality of the two zones are substantially the same and that dual completion methods will not endanger the resource.

APPENDIX A

LITHOLOGIC DESCRIPTIONS

Well No. 1 (2)

Source: Well completion report Permit No. 956
Description by Ken Lovejoy, McGregor Pump Co.

Interval	Thickness	Description
0-7	7	"Big" Sand
7-15	8	White clay
15-31	16	White clay and limestone
31-97	66	Green clay
97-137	40	Small "ball bearing" sand. [fine gravel]
137-145	8	Same with trace of green clay layers
145-202	57	Large "ball bearing" sand. [med.gravel]
202-205	3	White clay
205-207	2	Green clay
207-211	4	White limestone
211-255	44	White and tan limestone

Well No. 2 (2)

Source: Well completion report Permit No.1043
Description by Ken Lovejoy, McGregor Pump Co.

Interval	Thickness	Description
0-16	16	Sand
16-31	15	Sandy clay
31-53	22	Green clay
53-97	44	Sm. "ball bearing" sand. [fine gravel]
97-125	28	Same [as above] with clay
125-197	72	Coarse sand
197-210	13	Green clay
210-221	11	Grey limestone
221-239	19	Tan limestone
239-245	6	Grey limestone
245	?	Green clay

Well No. 3

Source: Well completion report Permit No. 1044
Description by Ken Lovejoy, McGregor Pump Co.

Interval	Thickness	Description
0-12	12	Sand
12-36	24	Sandy clay
36-43	7	Green clay
43-96	53	Fine sand
96-115	19	Med sand
115-189	74	Coarse sand
189-204	15	Green clay with some coarse sand
204-215	11	Grey limestone
215-240	25	Tan limestone
240-245	5	Grey limestone-green clay

Well No. 4

Source: Well completion report Permit No. 1035
Description by Ken Lovejoy, McGregor Pump Co.

Interval	Thickness	Description
0-27	27	Sand
27-44	17	Sandy clay
44-55	11	Green clay
55-135	80	Fine sand
135-178	35	Coarse sand with streaks of green clay
178-197	19	Green clay
197-202	5	Grey limestone
202-224	22	Grey and white limestone
224-240	16	Tan limestone (hard)
240-245	5	Green clay

Well No. 5

Source: Well completion report Permit No. 1022
Description by Ken Lovejoy, McGregor Pump Co.

Interval	Thickness	Description
0-18	18	Brown sand
18-25	7	Sandy white clay
25-33	8	Sandy green clay
33-121	88	Green clay
121-135	14	Small "ball bearing" sand [fine gravel] with clay streaks
135-186	51	Med. coarse sand
186-197	11	Coarse sand and green clay
197-219	22	White limestone
219-224	5	Cavity
224-235	11	Tan limestone
235-240	5	Hard grey limestone

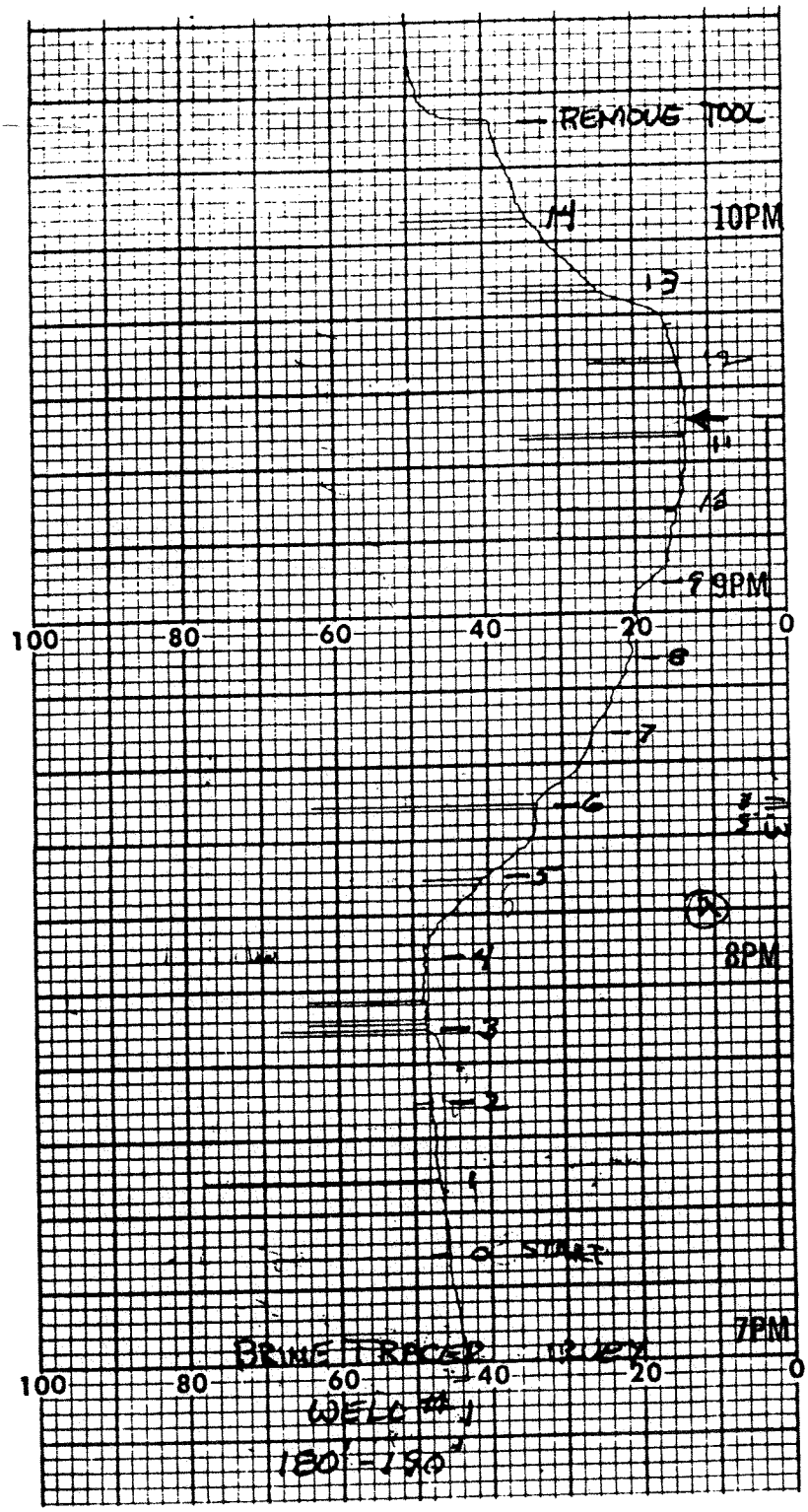
House well

Source: Well completion report Permit No. 1022
Description by Ken Lovejoy, McGregor Pump Co.

Interval	Thickness	Description
0-13	13	Sand
13-15	2	Sandstone
15-57	42	Green clay
57-93	36	Small "ball bearing sand"
93-165	72	Med to coarse "ball bearing sand" [gravel]
165-194	29	Same as above with clay stringers
194-200	6	Blue-green clay
200-216	16	White limestone
216-233	17	Tan and white limestone
233-240	7	Grey limestone

APPENDIX B

TRACER SURVEY DATA



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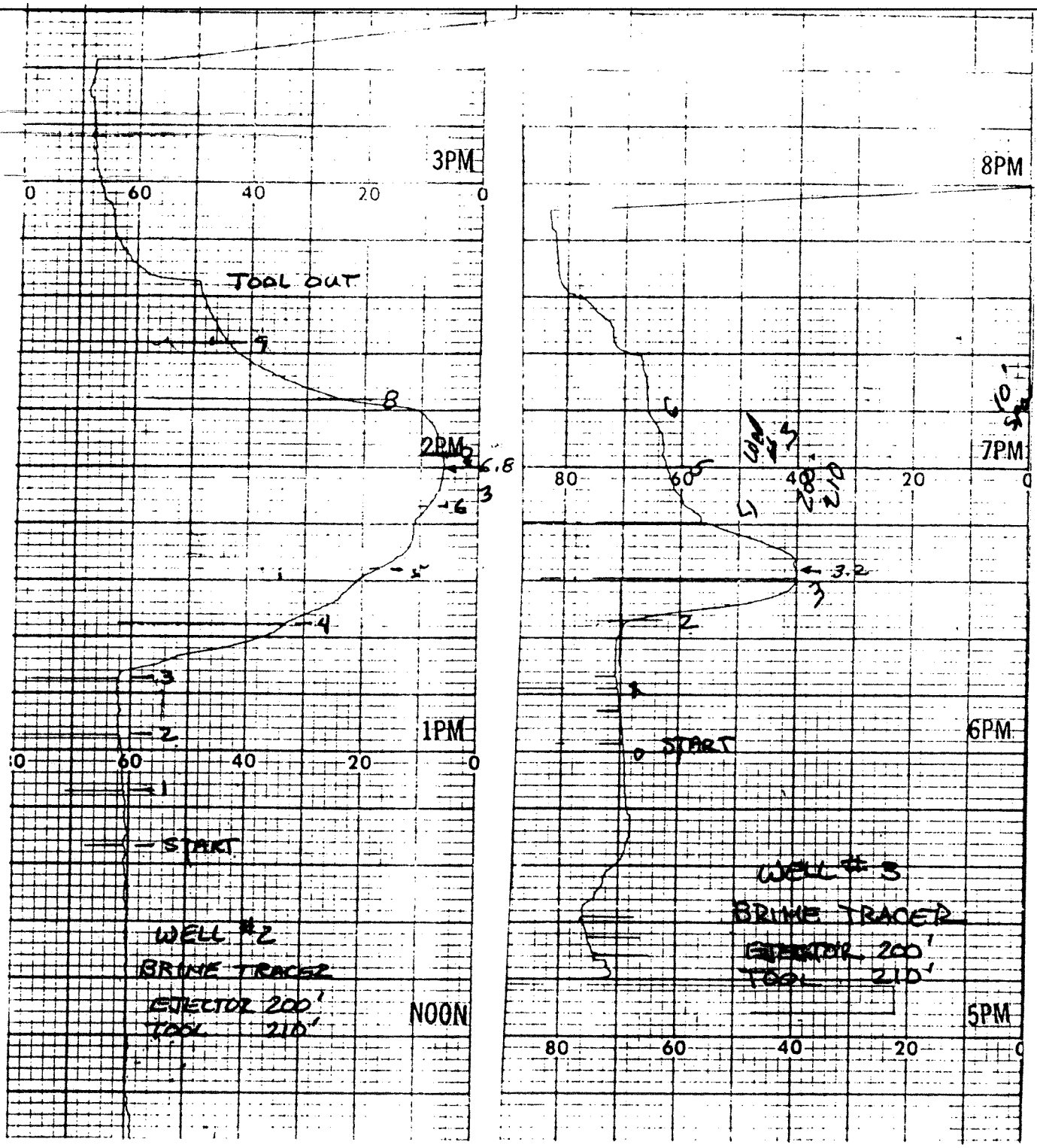
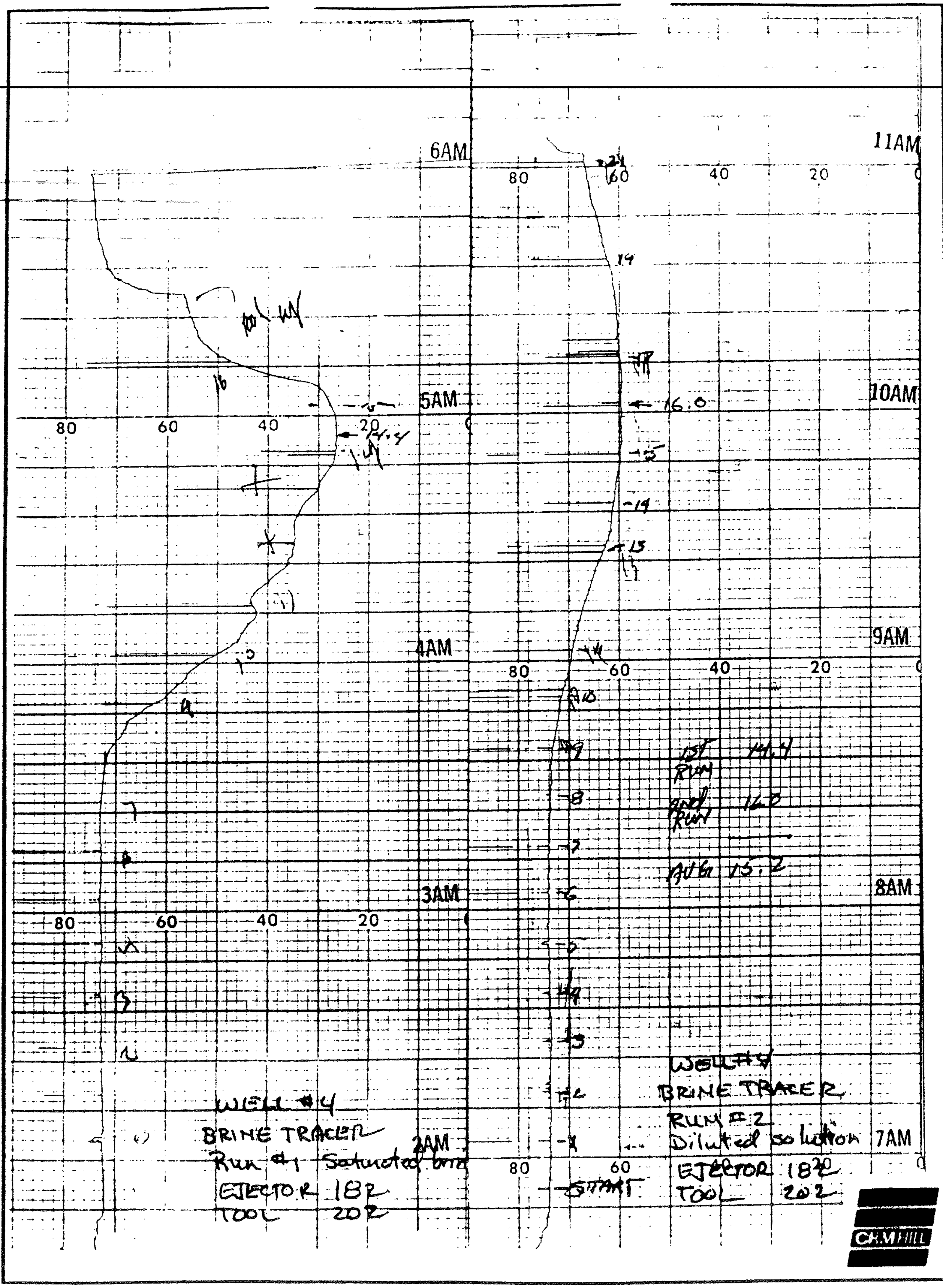
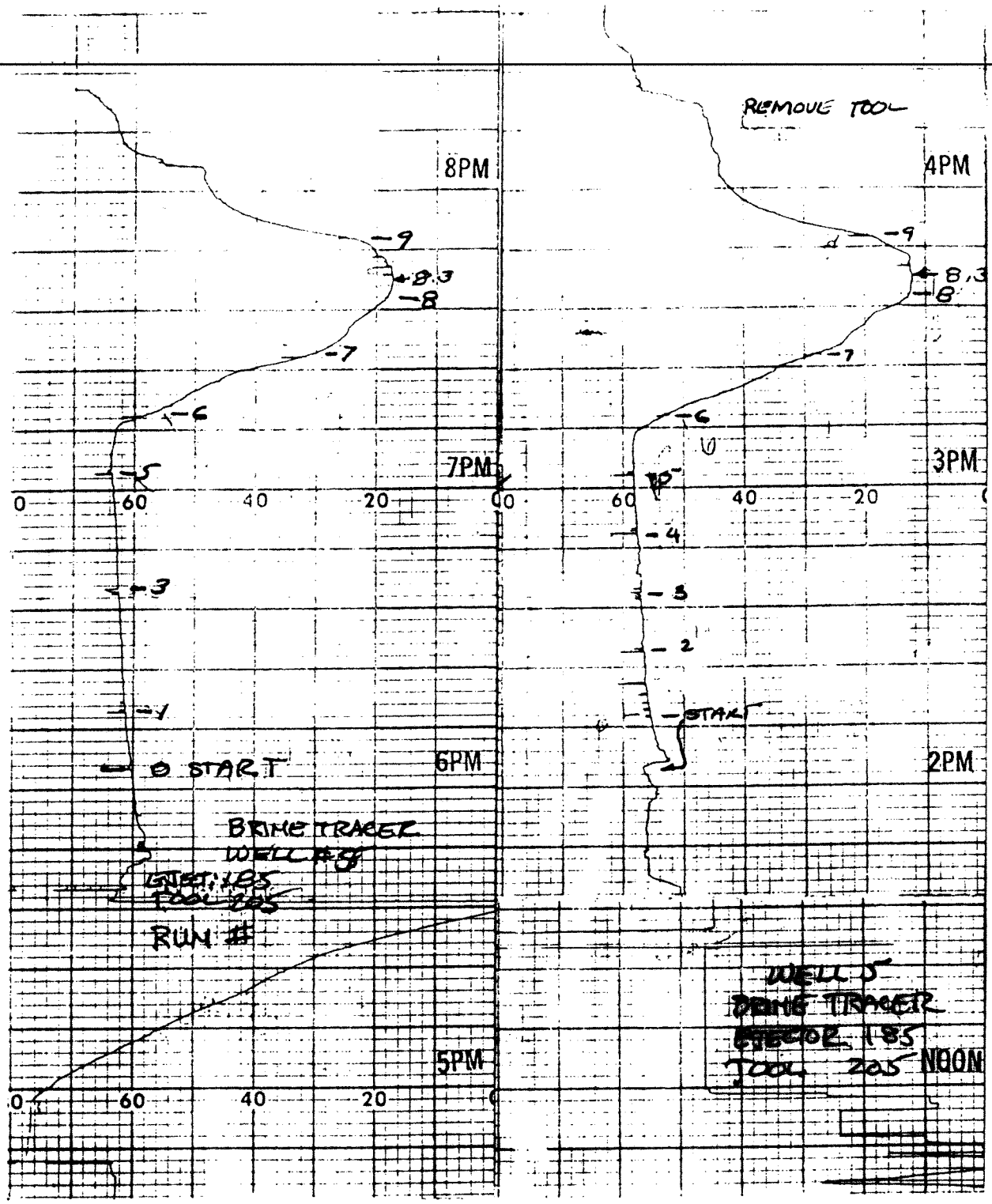
CH2M HILL


3PM
0
60
40
20
0
TOOL OUT
9
8
2PM
6.8
3
6
5
4
3
2
1PM
0
60
40
20
0
1
START
WELL #2
BRINE TRACER
EJECTOR 200'
TOOL 210'
NOON
8PM
6
5
4
3
7PM
80
60
40
20
0
3.2
2
1
0
START
6PM
WELL #3
BRINE TRACER
EJECTOR 200'
TOOL 210'
5PM
80
60
40
20
0



6AM
5AM
4AM
3AM
2AM
11AM
10AM
9AM
8AM
7AM
80
60
40
20
0
16.0
START
1st RUN 14.4
2nd RUN 16.0
WELL #4
BRINE TRACER
Run #1 Saturated brine
EJECTOR 18 P
TOOL 20 P
BRINE TRACER
RUN # 2
Diluted solution
EJECTOR 18 P
TOOL 20 P
CH2M HILL


REMOVE TOOL
8PM
4PM
7PM
3PM
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2PM
5PM
NOON
START
START
BRINE TRACER
WELL #5
INJECT. 185
TOOL 205
RUN #1
WELL 5
BRINE TRACER
INJECT. 185
TOOL 205
0
60
40
20
00

Step Drawdown Form

Permit number: 1-00262-W **Application number:** _____

Applicant's Name: TURNER CORPORATION

Project Name: GATOR SLOUGH WATER ASSOCIATION

Project Location: **Section:** 22 **Township:** 45 **Range:** 29E

Weather Conditions: SUNNY

Test Operator: AMS **Test Date:** 7-30-85

Pump Characteristics: **Power:** 40 HP; **Discharge Diameter:** 6 IN portable ~~test~~ pump used.

Flow Meter Type: ORFICE PLATE 4.75"

Static water Level: 11.5 FT from the Top of Casing

WELL #5

Discharge Rate (GPM)	Time (MIN)	Depth from Top of Casing to water Surface (FT)	Drawdown* (FT)	Chloride Conc. (MG/L)	Conductivity (MICROMHOS/CM)
647	5	40.0'	28.5	90.9	
647	10	40.0'	28.5		
647	15	40.0'	28.5		
647	20	40.0'	28.5		
647	25	40.0'	28.5		
647	30	40.0'	28.5		
SHUT DOWN 0	31	18.8'	7.3		
0	35	13.7'	2.2		
0	40	12.0'	.5		
0	45	11.7'	.2		
0	50	11.5	.0	90.9	

* Drawdown is the static water level minus pumping level.

NOTE: Attach copy of well log and completion report.

#1-00262-W SL1

Step Drawdown Form

Permit number: 1-00262-W Application number: _____

Applicant's Name: TURNER OPERATION

Project Name: GATOR HOUGH WATER ASSOCIATION

Project Location: Section: 22 Township: 4S Range: 28E

Weather Conditions: SUNNY

Test Operator: AMS Test Date: 7-30-85

Pump Characteristics: Power: 40 HP; Discharge Diameter: 6 IN portable test pump used.

Flow Meter Type: ORFICE PLATE 4.75"

Static water Level: 1.5 FT from the Top of Casing

WELL #5

Discharge Rate (GPM)	Time (MIN)	Depth from Top of Casing to water Surface (FT)	Drawdown* (FT)	Chloride Conc. (MG/L)	Conductivity (MICROMHOS/CM)
550	5	36.2	24.7	90.9	
550	10	37.0	25.5		
550	15	37.2	25.7		
550	20	37.4	25.9		
550	25	37.4	25.9		
550	30	37.4	25.9		
SHUT DOWN 0	31	18.0'	6.5		
0	35	13.5'	2.0		
0	40	12.2'	.7		
0	45	11.7'	.2		
0	50	11.5'	.0	90.9	

* Drawdown is the static water level minus pumping level.

NOTE: Attach copy of well log and completion report.

Step Drawdown Form

Permit number: 1-00262-W Application number: _____

Applicant's Name: TURNER IRRIGATION

Project Name: GATOR SLOUGH WATER ASSOCIATION

Project Location: Section: 22 Township: 45 Range: 29E

Weather Conditions: CLOUDY

Test Operator: AMS Test Date: 7-30-85

Pump Characteristics: Power: 40 HP; Discharge Diameter: 6 IN portable test pump used.

Flow Meter Type: ORFICE PLATE

Static water Level: 11.5 FT from the Top of Casing

WELL #5

Discharge Rate (GPM)	Time (MIN)	Depth from Top of Casing to water Surface (FT)	Drawdown* (FT)	Chloride Conc. (MG/L)	Conductivity (MICROMHOS/CM)
420	5	28.9	17.4	90.9	
420	10	29.9	3.4		
420	15	30.1'	18.6		
420	20	30.1'	18.6		
420	25	30.5'	19.0		
420	30	30.5'	19.0		
SHUT DOWN 0	31	16.0'	4.5		
0	35	12.0'	.5		
0	40	11.9'	.4		
0	45	11.6'	.1		
0	50	11.5'	.0	90.9	

* Drawdown is the static water level minus pumping level.

NOTE: Attach copy of well log and completion report.

Step Drawdown Form

Permit number: 1-0026.2-W Application number: _____

Applicant's Name: TURNER CORPORATION

Project Name: GATOR SLOUGH WATER ASSOCIATION

Project Location: Section: 22 Township: 45 Range: 28E

Weather Conditions: SUNNY

Test Operator: AMS Test Date: 7-30-85

Pump Characteristics: Power: 40 HP; Discharge Diameter: 6 IN portable test pump used.

Flow Meter Type: ORFICE PLATE 4.75"

Static water Level: 11.5 FT from the Top of Casing

WELL #5

Discharge Rate (GPM)	Time (MIN)	Depth from Top of Casing to water Surface (FT)	Drawdown* (FT)	Chloride Conc. (MG/L)	Conductivity (MICROMHOS/CM)
324	5	25.4	13.9	90.9	
324	10	25.7	14.2		
324	15	25.7	14.2		
324	20	25.8	14.3		
324	25	25.8	14.3		
324	30	25.9	14.4		
SHUT DOWN 0	31	14.6	3.1		
0	35	12.1'	.6		
0	40	2.0'	.5		
0	45	11.7'	.2		
0	50	11.5'	.0	90.9	

* Drawdown is the static water level minus pumping level.

NOTE: Attach copy of well log and completion report.

Step Drawdown Form

Permit number: 11-00262-W Application number: _____

Applicant's Name: TURNER CORPORATION

Project Name: GATOR SLOUGH WATER ASSOCIATION

Project Location: Section: 22 Township: 45 Range: 28E

Weather Conditions: OVERCAST

Test Operator: AMS Test Date: AUG. 16, 1985

Pump Characteristics: Power: ___ HP; Discharge Diameter: 6 IN * portable test pump used.

Flow Meter Type: ORFICE PLATE 4.75"

Static water Level: 6.1 FT from the Top of Casing

WELL # 4

Discharge Rate (GPM)	Time (MIN)	Depth from Top of Casing to water Surface (FT)	Drawdown* (FT)	Chloride Conc. (MG/L)	Conductivity (MICROMHOS/CM)
591	0	41.	34.9	90.9	
591	3	41.	34.9	"	
591	6	41.	34.9	"	
591	9	41.1	35.0	"	
591	12	41.1	35.0	"	
591	15	41.	34.9	"	
591	18	41.	34.9	"	
591	21	41.	34.9	"	
591	24	41.	34.9	"	
591	27	41.	34.9	"	
591	30	41.	34.9	"	
SHUT DOWN 0	31	10.0	3.9	"	
0	34	8.0	1.9	90.9	

* Drawdown is the static water level minus pumping level.

NOTE: Attach copy of well log and completion report.

Step Drawdown Form

Permit number: 11-00262-W Application number: _____

Applicant's Name: TURNER CORPORATION

Project Name: GATOR SLOUGH WATER ASSOCIATION

Project Location: Section: 22 Township: 45 Range: 28E

Weather Conditions: OVERCAST

Test Operator: AMS Test Date: AUG. 16, 1985

Pump Characteristics: Power: ___ HP; Discharge Diameter: 6 IN * portable test pump used.

Flow Meter Type: ORFICE PLATE 4.75"

Static water Level: 6.1 FT from the Top of Casing

WELL # 4

Discharge Rate (GPM)	Time (MIN)	Depth from Top of Casing to water Surface (FT)	Drawdown* (FT)	Chloride Conc. (MG/L)	Conductivity (MICROMHOS/CM)
0	37	7.0	.9	90.9	
0	40	6.8	.7		
0	43	6.5	.4		
0	46	6.4	.3		
0	49	6.3	.2		
0	52	6.2	.1	90.9	

* Drawdown is the static water level minus pumping level.

NOTE: Attach copy of well log and completion report.

Step Drawdown Form

Permit number: 11-00262-W Application number: _____

Applicant's Name: TURNER CORPORATION

Project Name: GATOR SLOUGH WATER ASSOCIATION

Project Location: Section: 22 Township: 45 Range: 28E

Weather Conditions: OVERCAST

Test Operator: AMS Test Date: AUG. 16, 1985

Pump Characteristics: Power: ___ HP; Discharge Diameter: 6 IN * portable test pump used.

Flow Meter Type: ORFICE PLATE 4.75"

Static water Level: 6.1 FT from the Top of Casing

WELL # 4

Discharge Rate (GPM)	Time (MIN)	Depth from Top of Casing to water Surface (FT)	Drawdown* (FT)	Chloride Conc. (MG/L)	Conductivity (MICROMHOS/CM)
502	0	36.8	30.7	90.9	
502	3	37.0	30.9		
502	6	37.4	31.3		
502	9	37.7	31.6		
502	12	37.8	31.7		
502	15	38.0	31.9		
502	18	38.1	32.		
502	21	38.1	32.		
502	24	38.1	[illegible]		
502	27	38.2	[illegible]		
502	30	38.2	[illegible]		
SHUT DOWN 0	31	10.6	4.5		
0	34	8.0	1.9	90.9	

* Drawdown is the static water level minus pumping level.

NOTE: Attach copy of well log and completion report.

Step Drawdown Form

Permit number: 11-00262-W Application number: _____

Applicant's Name: TURNER CORPORATION

Project Name: GATOR SLOUGH WATER ASSOCIATION

Project Location: Section: 22 Township: 45 Range: 28E

Weather Conditions: OVERCAST

Test Operator: AMS Test Date: AUG. 16, 1985

Pump Characteristics: Power: ___ HP; Discharge Diameter: 6 IN * portable test pump used.

Flow Meter Type: ORFICE PLATE 4.75"

Static water Level: 6.1 FT from the Top of Casing

WELL # 4

Discharge Rate (GPM)	Time (MIN)	Depth from Top of Casing to water Surface (FT)	Drawdown* (FT)	Chloride Conc. (MG/L)	Conductivity (MICROMHOS/CM)
0	37	7.9	1.8	90.9	
0	40	7.3	1.2	"	
0	43	7.0	.9	"	
0	46	6.8	.7	"	
0	49	6.5	.4	"	
0	52	6.2	.1	90.9	

* Drawdown is the static water level minus pumping level.

NOTE: Attach copy of well log and completion report.

Step Drawdown Form

Permit number: 11-00262-W Application number: _____

Applicant's Name: TURNER CORPORATION

Project Name: GATOR SLOUGH WATER ASSOCIATION

Project Location: Section: 22 Township: 45 Range: 28E

Weather Conditions: OVERCAST

Test Operator: AMS Test Date: AUG. 16, 1985

Pump Characteristics: Power: ___ HP; Discharge Diameter: 6 IN * portable test pump used.

Flow Meter Type: ORFICE PLATE 4.75"

Static water Level: 6.1 FT from the Top of Casing

WELL # 4

Discharge Rate (GPM)	Time (MIN)	Depth from Top of Casing to water Surface (FT)	Drawdown* (FT)	Chloride Conc. (MG/L)	Conductivity (MICROMHOS/CM)
384	0	29.6	23.5	90.9	
384	3	30.0	23.9		
384	6	30.0	23.9		
384	9	30.0	23.9		
384	12	30.0	23.9		
384	15	30.0	23.9		
384	18	30.0	23.9		
384	21	30.1	24.		
384	24	30.1	24.		
384	27	30.1	24.		
384	30	30.1	24.		
SHUTDOWN	31	8.9	2.8		
0	34	7.2	1.1	90.9	

* Drawdown is the static water level minus pumping level.

NOTE: Attach copy of well log and completion report.

Step Drawdown Form

Permit number: 11-00262-W Application number: _____

Applicant's Name: TURNER CORPORATION

Project Name: GATOR SLOUGH WATER ASSOCIATION

Project Location: Section: 22 Township: 45 Range: 28E

Weather Conditions: OVERCAST

Test Operator: AMS Test Date: AUG. 16, 1985

Pump Characteristics: Power: ___ HP; Discharge Diameter: 6 IN * portable test pump used.

Flow Meter Type: ORFICE PLATE 4.75"

Static water Level: 6.1 FT from the Top of Casing

WELL # 4

Discharge Rate (GPM)	Time (MIN)	Depth from Top of Casing to water Surface (FT)	Drawdown* (FT)	Chloride Conc. (MG/L)	Conductivity (MICROMHOS/CM)
0	37	7.2	1.1	90.9	
0	40	6.9	.8		
0	43	6.5	.4		
0	46	6.4	.3		
0	49	6.3	.2		
0	52	6.1	.0	90.9	

* Drawdown is the static water level minus pumping level.

NOTE: Attach copy of well log and completion report.

Step Drawdown Form

Permit number: 11-00262-W Application number: _____

Applicant's Name: TURNER CORPORATION

Project Name: GATOR SLOUGH WATER ASSOCIATION

Project Location: Section: 22 Township: 45 Range: 28E

Weather Conditions: OVERCAST

Test Operator: AMS Test Date: AUG. 16, 1985

Pump Characteristics: Power: ___HP; Discharge Diameter: 6 IN * portable test pump used.

Flow Meter Type: ORFICE PLATE 4.75"

Static water Level: 6.1 FT from the Top of Casing

WELL # 4

Discharge Rate (GPM)	Time (MIN)	Depth from Top of Casing to water Surface (FT)	Drawdown* (FT)	Chloride Conc. (MG/L)	Conductivity (MICROMHOS/CM)
296	0	24.3	18.2	90.0	
296	3	24.3	18.2		
296	6	24.4	18.3		
296	9	24.5	18.4		
296	12	24.5	18.4		
296	15	24.5	18.4		
296	18	24.6	18.5		
296	21	24.6	18.5		
296	24	24.6	18.5		
296	27	24.6	18.5		
296	30	24.6	18.5		
SHUT DOWN	31	8.0	1.9		
0	34	7.0	.9	90.9	

* Drawdown is the static water level minus pumping level.

NOTE: Attach copy of well log and completion report.

Step Drawdown Form

Permit number: 11-00262-W Application number: _____

Applicant's Name: TURNER CORPORATION

Project Name: GATOR SLOUGH WATER ASSOCIATION

Project Location: Section: 22 Township: 45 Range: 28E

Weather Conditions: OVERCAST

Test Operator: AMS Test Date: AUG. 16, 1985

Pump Characteristics: Power: ___ HP; Discharge Diameter: 6 IN * portable test pump used.

Flow Meter Type: ORFICE PLATE 4.75"

Static water Level: 6.1 FT from the Top of Casing

WELL # 4

Discharge Rate (GPM)	Time (MIN)	Depth from Top of Casing to water Surface (FT)	Drawdown* (FT)	Chloride Conc. (MG/L)	Conductivity (MICROMHOS/CM)
0	37	6.8	.7	90.9	
0	40	6.6	.5	〃	
0	43	6.5	.4	〃	
0	46	6.3	.2	〃	
0	49	6.2	.1	〃	
0	52	6.2	.1	90.9	

* Drawdown is the static water level minus pumping level.

NOTE: Attach copy of well log and completion report.

Step Drawdown Form

Permit number: 11-00262-W Application number: _____

Applicant's Name: TURNER CORPORATION

Project Name: GATOR SLOUGH WATER ASSOCIATION

Project Location: Section: 22 Township: 45 Range: 28E

Weather Conditions: OVERCAST

Test Operator: AMS Test Date: 7-15-85

Pump Characteristics: Power: __ HP; Discharge Diameter: 6 IN * portable test pump used.

Flow Meter Type: ORFICE PLATE 4.75"

Static water Level: 9.2 FT from the Top of Casing

WELL #3

Discharge Rate (GPM)	Time (MIN)	Depth from Top of Casing to water Surface (FT)	Drawdown* (FT)	Chloride Conc. (MG/L)	Conductivity (MICROMHOS/CM)
561	0	30.0	20.8	90.9	
561	5	30.2	21.0		
561	10	30.2	21.0		
561	15	31.0	21.8		
561	20	31.0	21.8		
561	25	31.0	21.8		
561	30	31.0	21.8		
SHUT DOWN 0	31	11.3	2.1		
0	35	9.8	.6		
0	40	9.6	.4		
0	45	9.6	.4		
0	50	9.3	.1	90.9	

* Drawdown is the static water level minus pumping level.

NOTE: Attach copy of well log and completion report.

Step Drawdown Form

Permit number: 11-00262-W Application number: _____

Applicant's Name: TURNER CORPORATION

Project Name: GATOR SLOUGH WATER ASSOCIATION

Project Location: Section: 22 Township: 45 Range: 28E

Weather Conditions: OVERCAST

Test Operator: AMS Test Date: 7-15-85

Pump Characteristics: Power: ___ HP; Discharge Diameter: 6 IN * portable test pump used.

Flow Meter Type: ORFICE PLATE 4.75"

Static water Level: 9.2 FT from the Top of Casing

WELL #3

Discharge Rate (GPM)	Time (MIN)	Depth from Top of Casing to water Surface (FT)	Drawdown* (FT)	Chloride Conc. (MG/L)	Conductivity (MICROMHOS/CM)
477	0	27.0	17.8	90.9	
477	5	27.0	17.8		
477	10	27.8	18.6		
477	15	27.8	18.6		
477	20	28.0	18.8		
477	25	28.0	18.8		
477	30	28.0	18.8		
SHUT DOWN 0	31	10.0	.8		
0	35	9.8	.6		
0	40	9.5	.3		
0	45	9.5	.3		
0	50	9.3	.1	90.9	

* Drawdown is the static water level minus pumping level.

NOTE: Attach copy of well log and completion report.

Step Drawdown Form

Permit number: 11-00262-W Application number: _____

Applicant's Name: TURNER CORPORATION

Project Name: GATOR SLOUGH WATER ASSOCIATION

Project Location: Section: 22 Township: 45 Range: 28E

Weather Conditions: OVERCAST

Test Operator: AMS Test Date: 7-15-85

Pump Characteristics: Power: ___ HP; Discharge Diameter: 6 IN * portable test pump used.

Flow Meter Type: ORFICE PLATE 4.75"

Static water Level: 9.2 FT from the Top of Casing

WELL #3

Discharge Rate (GPM)	Time (MIN)	Depth from Top of Casing to water Surface (FT)	Drawdown* (FT)	Chloride Conc. (MG/L)	Conductivity (MICROMHOS/CM)
365	0	22.4	13.2	90.9	
365	5	22.4	13.2		
365	10	23.1	13.9		
365	15	23.1	13.9		
365	20	23.1	13.9		
365	25	23.3	14.1		
365	30	23.3	14.1		
SHUT DOWN	31	11.1	1.9		
0	35	9.9	.7		
0	40	9.5	.3		
0	45	9.5	.3		
0	50	9.3	.1	90.9	

* Drawdown is the static water level minus pumping level.

NOTE: Attach copy of well log and completion report.

Step Drawdown Form

Permit number: 11-00262-W Application number: _____

Applicant's Name: TURNER CORPORATION

Project Name: GATOR SLOUGH WATER ASSOCIATION

Project Location: Section: 22 Township: 45 Range: 28E

Weather Conditions: OVERCAST

Test Operator: AMS Test Date: 7-15-85

Pump Characteristics: Power: ___ HP; Discharge Diameter: 6 IN * portable test pump used.

Flow Meter Type: ORFICE PLATE 4.75"

Static water Level: 9.2 FT from the Top of Casing

WELL #3

Discharge Rate (GPM)	Time (MIN)	Depth from Top of Casing to water Surface (FT)	Drawdown* (FT)	Chloride Conc. (MG/L)	Conductivity (MICROMHOS/CM)
281	0	19.7	10.5	90.9	
281	5	19.7	10.5		
281	10	19.9	10.7		
281	15	19.9	10.7		
281	20	19.9	10.7		
281	25	19.9	10.7		
281	30	20.0	10.8		
SHUT DOWN 0	31	10.1	.9		
0	35	10.0	.8		
0	40	9.8	.6		
0	45	9.5	.3		
0	50	9.3	.1		

* Drawdown is the static water level minus pumping level.

NOTE: Attach copy of well log and completion report.

Step Drawdown Form

Permit number: 11-00262-W Application number: _____

Applicant's Name: TURNER CORPORATION

Project Name: GATOR SLOUGH WATER ASSOCIATION

Project Location: Section: 22 Township: 45 Range: 28E

Weather Conditions: SUNNY / DRY

Test Operator: AMS Test Date: 5-30-85

Pump Characteristics: Power: ___ HP; Discharge Diameter: 6 IN * portable test pump used,

Flow Meter Type: ORFICE PLATE 4.75"

Static water Level: 12.8 FT from the Top of Casing

WELL # 2

Discharge Rate (GPM)	Time (MIN)	Depth from Top of Casing to water Surface (FT)	Drawdown* (FT)	Chloride Conc. (MG/L)	Conductivity (MICROMHOS/CM)
765	0	29.8	17.0	61.	
765	5	29.8	17.0		
765	10	29.8	17.0		
765	15	29.8	17.0		
765	20	30.8	18.0		
765	25	31.0	18.2		
765	30	31.0	18.2		
SHUT DOWN 0	31	13.5	.7		
0	35	13.3	.5		
0	40	13.2	.4		
0	45	13.0	.2		
0	50	13.0	.2	61.	

* Drawdown is the static water level minus pumping level.

NOTE: Attach copy of well log and completion report.

Step Drawdown Form

Permit number: 11-00262-W Application number: _____

Applicant's Name: TURNER CORPORATION

Project Name: GATOR SLOUGH WATER ASSOCIATION

Project Location: Section: 22 Township: 45 Range: 28E

Weather Conditions: DRY / SUNNY

Test Operator: AMS Test Date: 5-30-85

Pump Characteristics: Power: ___ HP; Discharge Diameter: 6 IN * portable test pump used.

Flow Meter Type: ORFICE PLATE 4.75"

Static water Level: 12.8 FT from the Top of Casing

WELL #2

Discharge Rate (GPM)	Time (MIN)	Depth from Top of Casing to water Surface (FT)	Drawdown* (FT)	Chloride Conc. (MG/L)	Conductivity (MICROMHOS/CM)
650	0	26.1	13.3	61	
650	5	26.1	13.3		
650	10	26.7	13.9		
650	15	26.7	13.9		
650	20	26.9	14.1		
650	25	27.4	14.6		
650	30	27.4	14.6		
SHUT DOWN 0	31	13.4	.6		
0	35	13.4	.6		
0	40	13.2	.4		
0	45	13.0	.2		
0	50	12.9	.1	61	

* Drawdown is the static water level minus pumping level.

NOTE: Attach copy of well log and completion report.

Step Drawdown Form

Permit number: 11-00262-W Application number: _____

Applicant's Name: TURNER CORPORATION

Project Name: GATOR SLOUGH WATER ASSOCIATION

Project Location: Section: 22 Township: 45 Range: 28E

Weather Conditions: SUNNY / DRY

Test Operator: AMS Test Date: 5-30-85

Pump Characteristics: Power: __ HP; Discharge Diameter: 6 IN *portable test pump used.

Flow Meter Type: ORFICE PLATE 4.75"

Static water Level: 12.8 FT from the Top of Casing

WELL #2

Discharge Rate (GPM)	Time (MIN)	Depth from Top of Casing to water Surface (FT)	Drawdown* (FT)	Chloride Conc. (MG/L)	Conductivity (MICROMHOS/CM)
497	0	21.8	9.0	61	
497	5	22.0	9.2		
497	10	22.0	9.2		
497	15	22.0	9.2		
497	20	22.6	9.8		
497	25	22.4	9.6		
497	30	22.4	9.6		
SHUT DOWN 0	31	13.4	.6		
0	35	13.2	.4		
0	40	13.2	.4		
0	45	13.2	.4		
0	50	13.0	.2	61	

* Drawdown is the static water level minus pumping level.

NOTE: Attach copy of well log and completion report.

Step Drawdown Form

Permit number: 11-00262-W Application number: _____

Applicant's Name: TURNER CORPORATION

Project Name: GATOR SLOUGH WATER ASSOCIATION

Project Location: Section: 22 Township: 45 Range: 28E

Weather Conditions: SUNNY / DRY

Test Operator: AMS Test Date: 5-30-85

Pump Characteristics: Power: ___HP; Discharge Diameter: 6 IN* portable test pump used.

Flow Meter Type: ORFICE PLATE 4.75"

Static water Level: 12.8 FT from the Top of Casing

WELL # 2

Discharge Rate (GPM)	Time (MIN)	Depth from Top of Casing to water Surface (FT)	Drawdown* (FT)	Chloride Conc. (MG/L)	Conductivity (MICROMHOS/CM)
383	0	18.6	5.8	61	
383	5	19.1	6.3		
383	10	19.1	6.3		
383	15	19.1	6.3		
383	20	19.2	6.4		
383	25	19.2	6.4		
383	30	19.2	6.4		
SHUT DOWN 0	31	13.3	.5		
0	35	13.3	.5		
0	40	13.0	.2		
0	45	13.0	.2		
0	50	13.0	.2	61	

* Drawdown is the static water level minus pumping level.

NOTE: Attach copy of well log and completion report.

Step Drawdown Form

Permit number: 11-00262-W Application number: _____

Applicant's Name: TURNER CORPORATION

Project Name: GATOR SLOUGH WATER ASSOCIATION

Project Location: Section: 22 Township: 45 Range: 28E

Weather Conditions: SUNNY / DRY

Test Operator: AMS Test Date: 5-24-85

Pump Characteristics: Power: ___ HP; Discharge Diameter: 6 IN * Portable test pump used.

Flow Meter Type: ORFICE PLATE 4.75"

Static water Level: 15.5 FT from the Top of Casing

WELL # 1

Discharge Rate (GPM)	Time (MIN)	Depth from Top of Casing to water Surface (FT)	Drawdown* (FT)	Chloride Conc. (MG/L)	Conductivity (MICROMHOS/CM)
563	0	32.0	16.5	91.	
563	2	32.5	17.0		
563	6	32.6	17.1		
563	7 thru 30	32.8	17.3		
SHUT DOWN 0	35	17.0	1.5		
0	40	16.8	1.3		
0	45	16.0	.5		
0	50	15.7	.2		
0	55	15.5	.0	91.	

* Drawdown is the static water level minus pumping level.

NOTE: Attach copy of well log and completion report.

Step Drawdown Form

Permit number: 11-00262-W Application number: _____

Applicant's Name: TURNER CORPORATION

Project Name: GATOR SLOUGH WATER ASSOCIATION

Project Location: Section: 22 Township: 45 Range: 28E

Weather Conditions: SUNNY / DRY

Test Operator: AMS Test Date: 5-24-85

Pump Characteristics: Power: ___ HP; Discharge Diameter: 6 IN * portable test pump used.

Flow Meter Type: ORFICE PLATE 4.75"

Static water Level: 15.5 FT from the Top of Casing

WELL # 1

Discharge Rate (GPM)	Time (MIN)	Depth from Top of Casing to water Surface (FT)	Drawdown* (FT)	Chloride Conc. (MG/L)	Conductivity (MICROMHOS/CM)
473	0	27.5	12.0	91.	
473	5	27.4	11.9		
473	10	27.6	12.1		
473	15	27.7	12.2		
473	20	27.5	12.0		
473	25	27.6	12.1		
473	30	27.7	12.2		
SHUT DOWN 0	31	16.8	1.3		
0	35	15.9	.4		
0	40	15.8	.3		
0	45	15.7	.2		
0	50	15.5	.1	91.	

* Drawdown is the static water level minus pumping level.

NOTE: Attach copy of well log and completion report.

Step Drawdown Form

Permit number: 11-00262-W Application number: _____

Applicant's Name: TURNER CORPORATION

Project Name: GATOR SLOUGH WATER ASSOCIATION

Project Location: Section: 22 Township: 45 Range: 28E

Weather Conditions: SUNNY/DRY

Test Operator: AMS Test Date: 5-24-85

Pump Characteristics: Power: ___ HP; Discharge Diameter: 6 IN * portable ~~test~~ pump used.

Flow Meter Type: ORFICE PLATE 4.75"

Static water Level: 15.5 FT from the Top of Casing

WELL # 1

Discharge Rate (GPM)	Time (MIN)	Depth from Top of Casing to water Surface (FT)	Drawdown* (FT)	Chloride Conc. (MG/L)	Conductivity (MICROMHOS/CM)
421	0 thru 5	25.2	9.7	91.	
421	10	25.3	9.8		
421	15	25.2	9.7		
421	20 thru 30	25.3	9.8		
SHUT DOWN 0	31	17.5	2.0		
0	35	16.0	.5		
0	40	15.7	.2		
0	45	15.6	.1		
0	50	15.5	.0	91.	

* Drawdown is the static water level minus pumping level.

NOTE: Attach copy of well log and completion report.

Step Drawdown Form

Permit number: 11-00262-W Application number: _____

Applicant's Name: TURNER CORPORATION

Project Name: GATOR SLOUGH WATER ASSOCIATION

Project Location: Section: 22 Township: 45 Range: 28E

Weather Conditions: SUNNY / DRY

Test Operator: AMS Test Date: 5-24-85

Pump Characteristics: Power: ___ HP; Discharge Diameter: 6 IN * portable test pump used.

Flow Meter Type: ORFICE PLATE 4.75"

Static water Level: 15.5 FT from the Top of Casing

WELL # 1

Discharge Rate (GPM)	Time (MIN)	Depth from Top of Casing to water Surface (FT)	Drawdown* (FT)	Chloride Conc. (MG/L)	Conductivity (MICROMHOS/CM)
360	0	23.0	7.5	.91	
360	5	22.8	7.3		
360	10	22.7	7.2		
360	15	22.7	7.2		
360	20	22.6	7.1		
360	25	22.7	7.2		
360	30	22.7	7.2		
SHUT DOWN 0	31	15.7	.2		
0	35	15.6	.1		
0	40	15.6	.1		
0	45	15.6	.1		
0	50	15.6	.1	.91	

* Drawdown is the static water level minus pumping level.

NOTE: Attach copy of well log and completion report.