SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT
2379 BROAD STREET
BROOKSVILLE, FLORIDA 34604-6899
TELEPHONE: 352-505-2970 FAX: 352-754-3497

January 30, 2023

RFB 22-3944 – MONITOR WELL CONSTRUCTION SERVICES

ADDENDUM #1
(Acknowledgment is required.)

The Respondent shall acknowledge its review and receipt of this Addendum by signing below and including a signed copy of this Addendum with its bid submittal, or as stated in Section 4.1, Basis for Award of Agreement of the RFB. Failure to do so could result in disqualification of the bid.

Please note that underlined information (*example*) is added wording and stricken information (~~*example*~~) is deleted wording.

I. CLARIFICATIONS:

1. **The due date has been changed from February 7, 2023 to February 14, 2023 at 2 P.M. local time.**
2. **A second mandatory Pre-Bid/Site Visit will be held on February 2, 2023 at 2 P.M. at** ROMP 88.5 – Northeast Polk Monitor Well Site near 9450 Hog Farm Road, Polk City, Florida 33868 Section/Township/Range: S24/T25S/R25E Latitude: 28° 17' 29.08" N Longitude: 81° 46' 20.94" W**. Any contractor that attended the original Pre-Bid/Site Visit is not required to attend the second meeting.**
3. **3.4.1 WELL TO WELL SET UP – Contractor will be paid up to ~~two (2) hours~~ four (4) hours of the EQUIPMENT RATE (NO DRILLING), submitted on the Bid Response Form to set up drill equipment on each well outlined in the Agreement.**
4. **The District requests that the awarded contractor begin work with the deepest well first. The deepest well will reach a depth of 2,500 feet.**

II. QUESTIONS AND ANSWERS:

1. **Question:** **Is there an area designated for discharge? If so, where is it located?**
   Answer: Yes, any location in the fenced in area where equipment is not located can be used for discharge.
2. **Question:** **Who is supplying formation packers?**
   Answer: The District will be supplying the formation packers to the Contractor.
3. **Question:** **What is the anticipated start date?**
   Answer: The District desires a start date in April; however, this date could be flexible. Please enter the month your firm is able to commence work on the line indicated on page 4 of this Addendum.

4. **Question:** **Are copies of the Lithological data/logs available?**

   Answer: Yes, the Lithological data logs are attached. Please reference Exhibit 1 included with this Addendum.

5. **Question:** **Under 2.24 Liquidated Damages, it states "Liquidated damages are not applicable for this RFB." So, will there be no penalties applied to the contract if performing beyond the 10 month substantial completion date?**

   Answer: If the contractor is unable to reach substantial completion within a 10-month period, the delay may reflect negatively on the firm's performance rating by the District.

6. **Question:** **Is the contractor responsible for taking core samples?**

   Answer: No, core samples or drill samples are not required.

7. **Question:** **If the contractor is to take core samples, what size core sample is required?**

   Answer: Core samples are not applicable to this project.

8. **Question:** **Is Polk County willing to negotiate a longer term substantial completion date?**

   Answer: This project is being solicited by the Southwest Florida Water Management District and not Polk County. The District is open to negotiating an additional one to two months for substantial completion if there are extenuating circumstances.

9. **Question:** **With regards to discharge, can the county have the pit made prior to the mobilization and the contractor take care of the restoration thereafter? Or must the contractor do that themselves completely?**

   Answer: The Contractor is responsible for digging the discharge pit on site as well as the restoration of the site.

10. **Question:** **Is there an estimated budget for this project? If so, what is the estimated budget?**

    Answer: The estimated budget is $1,030,000.

11. **Question:** **Has there been any issues with the neighboring residents?**

    Answer: No, there are no issues with the neighboring residents.

12. **Question:** **Is working 24/7 an option? If not, what are the allowable working hours?**

Answer: Working 24/7 is not an option for this project. The allowable working hours will be 7 A.M. to 7 P.M. four to five days a week.

13. **Question:** **What is the flow of water on site?**
Answer: The water flows at 33 gallons per minute. This water can be used by the Contractor throughout the duration of the project. Once the well is constructed, water may be pumped from the well too.

14. **Question:** **Is there electricity on site?**
Answer: Yes, there is electricity on site.

15. **Question:** **Can we extend the two-hour window that is allotted to move the rigs between wells?**
Answer: Yes. The District has increased the time allotted from 2 hours to 4 hours.

16. **Question:** **Will Provac Services be preferred?**
Answer: This is the Contractor's choice. It is the Contractor's responsibility to ensure mud or drilling fluids are removed from the pit.

17. **Question:** **Has there been any issues with Gopher Tortoises?**
Answer: No, the District has not found any gopher tortoises or any gopher tortoise holes.

18. **Question:** **Has there been any issues in regard to security of the site?**
Answer: No, there has not been any issues regarding security of keeping supplies or equipment at the site.

19. **Question:** **On the submittal, are digital signatures acceptable?**
Answer: Yes, digital signatures are acceptable to use on the submittal.

20. **Question:** **Is the Port-O-Potty the responsibility of the District or Contractor?**
Answer: The District is responsible for the Port-O-Potty, and it can be used by the Contractor.

21. **Question:** **Would you consider awarding the contract to the contractor with the quickest availability instead of the contractor with the lowest bid?**
Answer: Delivery time frame may be a factor in award of this bid.

22. **Question:** **Are there any issues with drainage from the discharge?**
Answer: No, the property and discharge site drain well and are typically dried out and empty by the next morning.

23. Question: **Is the county willing to go with a 4-inch open hole rather than a 10-inch?**

Answer: No, the District would not be willing to change the standard of the 10-inch open hole.

III. EXHIBIT

1. Hydrogeology Field Logs

If awarded this contract, please insert your company's available start date: _____
(month, date, year)

Celeste Larisey
Procurement Specialist
cc: Project Manager

ACKNOWLEDGEMENT OF ADDENDUM #1

BY: _____
DATE

_____
(TYPE/PRINT NAME AND TITLE)

_____
COMPANY NAME

End of Addendum #1 for RFB 22-3944

EXHIBIT 1

HYDROGEOLOGY FIELD LOG

DRAFT

Site Name: Romp 88.5 - Northeast Polk

Hydrogeologist: J. Zydek

Date	Box No.	Geology	Hydrogeology	Hydrostrat.	Depth (ft bls)	Recovery (%)	Lithology	Porosity (%)	Description	Test Interval	~~Packer Test WL, WQ, Purge Record~~	Driller's Notes
9/4/18	1	UDSC			0-5	0%			SAND, grayish brown (10 YR 5/2), medium-coarse grained, sub rounded, quartz sand 3 feet - pale brown (10YR 6/3) sand w/ organics 3.5 feet - light yellowish brown (10 YR 6/4), some clay		Root material wet @ 2.3'	Hand auger
9/4/18	1 2	unconsolidated recent Cypresshead Formation			5-10	0%			4.6 feet - CLAYEY SAND, white (10YR 8/1) to v. pale brown (10YR 7/3) ~50% clay; 50% sand, medium grained, sub angular to sub rounded		flecks of pink (7.5 YR 7/3) to red (2.5 Y 4/5 5/8) clay organics present as flecks	Begin push shoe
9/4/18	2		Permeable	Surficial aquifer	10-15	62%			As above, sand content increases but there are lenses of sandy clay			
9/5/18	3				15-20	0%			QUARTZ SAND, light gray (10 YR 7/2) to pinkish gray (5 YR 7/2), fine to medium grained, sub rounded, >75% clay, >5% phosphate grains? or organics		pinkish gray (5 YR 7/2), fine	
9/5/18	3				20-25	32%						
9/5/18	3				25-30	0%			QUARTZ SAND, white (10 YR 8/1) fine-med grained, sub angular - sub rounded, silty			
9/5/18	3				30-35	20%						
9/5/18	3				35-40	0%			As above, color change to light gray (10 YR 7/2) to V. pale brown (10 YR 7/3)			
9/5/18	4				40-45	65%			40' 75' As above, fine-coarse-grained phosphate present Quartz grains increasing in size, very coarse silt content increasing			
9/5/18	4				45-50	0%						
9/5/18	9				50-55	9%						

HYDROGEOLOGY FIELD LOG

DRAFT

Site Name: Romp 88, S - Northeast Polk

Hydrogeologist: J. Tyler

Date	Box No.	Geology	Hydrogeology	Hydrostrat.	Depth (ft bls)	Recovery (%)	Lithology	Porosity (%)	Description	Test Interval	Packer Test WL, WQ, Purge Record	Notes
9/5/18	A		permeable	surficial aquifer	55-60	0%		5	CLAYEY QUARTZ SAND, white (10YR 8/1) v. fine grained w/ ~30% clay, 50% sand / very coarse grained,		very coarse, trace phosphate	
9/5/18	A 5				60-65	92		10	coarsening of sand grains, clay content decreasing			
9/5/18	5				65-70	0%		5	- clay lenses at bottom of run Sample alternating btwn above description and CLAYEY QUARTZ SAND, dark gray (2.5Y 4/1), v. fine grained,		- sample very wet & muddy	
9/5/18	5	Hawthorn	very low permeability	confining unit	70-75	35%		15	70± QUARTZ SANDY CLAY, v. dark greenish gray (GLEY 1 3/1), fine grained, subrounded		top of reworked, undifferentiated Hawthorn Group?	
9/6/18	5	reworked, undiff.			75-80	0%						
9/6/18	6				80-85	5%						
9/6/18	6	Ocala Limestone	mod - high perm	upper Floridan aquifer	85-90	70%		~5	~82' WACKESTONE / PACKESTONE, gray (2.5Y 6/1), very weathered, trace quartz sand, unconsolidated, intergranular ϕ, low perm / poor ind.		Lepis? present quartz grains are rounded (could be reworked Hawthorn Group intermixed)	85-95 → hard drilling 89' → 80% loss circulation
9/6/18	6				90-95	7%						
9/10/18	7				95-100	0%		5	GRAINSTONE, light gray (2.5Y 7/1), intergranular ϕ, low perm / medium biogenic grains, poor ind.		Circles appear to be made up of forams → amphistegina presence?	95-105 → hard drilling
9/10/18	7				100-105	18%						
9/10/18	7				105-110	60%		20	106 → as above, good induration, intergranular, vuggy, moldic ϕ, moderate to high perm.		fossil molds include urchin spines, possibly Heterostegina Ocalana, bivalves, bryozoan Some macro fossil molds, brachiopods	107-115 → soft drilling

HYDROGEOLOGY FIELD LOG

DRAFT

Site Name: ROMP 88.5 - Northeast Polk

Hydrogeologist: J. Zydek

Date	Box No.	Geology	Hydrogeology	Hydrostrat.	Depth (ft bls)	Recovery (%)	Lithology	Porosity (%)	Description	Test Interval	Packer Test WL, WQ, Purge Record	Notes
9/10/18	7	Ocala Limestone	permeable	Upper Floridan aquifer	110-115	60%			As above			
9/10/18	7				115-120	40%			↓			115-125 → soft drilling
9/11/18	8				120-125				↓		~120 - Eupatagus mold	
9/11/18	8				125-130	0%			↓			125-135 → soft drilling
9/11/18	8				130-135	56			↓			
9/12/18	8				135-140	30%			↓			135-145 → soft drilling
9/12/18	9	Avon Park Fm			140-145				-140' - GRAINSTONE, pale brown (10YR 6/3),		Top of AVPK Fm? lithology change & γ kick on water supply log @ 140'	
9/12/18	9				145-150	20%			↓			145-155 → soft drilling
9/12/18	9				150-155				↓		~154 - Neolaganum dalli?	
9/12/18	9				155-160	20%		30%	↓		Cones (Cushmania Americana)? & Fallotella floridana	155-165 → soft drilling
9/12/18	9				160-165				↓		☆ organics in core? darker colored / mottled areas	

HYDROGEOLOGY FIELD LOG

DRAFT

Site Name: Romp 88.5 - Northeast Polk

Hydrogeologist: J. Zydek

Date	Box No.	Geology	Hydrogeology	Hydrostrat.	Depth (ft bls)	Recovery (%)	Lithology	Porosity (%)	Description	Test Interval	Packer Test WL, WQ, Purge Record	Notes
9/12/18	9				165-170							165-175 → soft drilling
9/12/18	9				170-175	22%		20%	As above, but probably more like packstone.			
9/12/18	9				175-180	0%						175-185 → soft drilling hard spot @ 183'
9/12/18	9				180-185	2%						
	10											
	10				185-190	0%		10%	UNCONSOLIDATED LIMESTONE, v. pale brown (10YR 8/2), loose, friable grainstone, inter-granular Φ, poor induration			185-195 → soft drilling little harder @ 193'
	10				190-195	4%		10%	GRAINSTONE/PACKSTONE/WACKESTONE interbedding, intergranular & some moldic Φ			
9/13/18	10	Avon Park formation	permeable	upper Floridan aquifer	195-200	0%		20%	196 GRAINSTONE, as above, thin laminations of compacted, mud supported rock, fine grained, good induration, intergranular & vuggy Φ			195-197 → hard 197-203 → soft 203-205 → hard
9/13/18	11				200-205	7%		5-20%	PACKSTONE, very pale brown (10YR 8/2), Chalky, friable, poor-moderate ind, v. fine-coarse grained, cones & forams, intergranular/vuggy Φ			
9/13/18	11				205-210	60%		35%	MUDSTONE, v. pale brown (10YR 8/2), chalky, vuggy Φ, good induration,		Some layers of GRAINSTONE 3 → 6 inches thick	205-215 → soft drilling
9/13/18	12				210-215	0%		50%	GRAINSTONE/PACKSTONE, v. pale brown (10YR 8/2), v. fine-coarse grained, mod-good ind, ; inter-crystalline, vuggy, moldic Φ, chalky, high perm		fossil molds present (Snails) some fossils are gray → mineral replacement?	
9/13/18	12				215-220	0%		5-20%	216 Some DOLOMITIC recrystallization, light gray to light brownish gray (10YR 7/2 - 6/2), vuggy Φ, very good induration.		organic lams	215-225 → hard drilling

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HYDROGEOLOGY FIELD LOG

Site Name: Romp Off, S - Northeast Polk

Hydrogeologist: J. Zydek

low Alt dolostone w/ interbedded LS.

Date	Box No.	Geology	Hydrogeology	Hydrostrat.	Depth (ft bls)	Recovery (%)	Lithology	Porosity (%)	Description	Test Interval	Packer Test WL, WQ, Purge Record	Notes
9/13	12/13			Perm	220-225			50%	(continued from previous page) @ 217 feet DOLOSTONE, some sucrosic layers, color similar to above description, refined grained, some fossil fragments, vuggy & moldic Φ, v. good ind., high perm		Sample alternates between this description & wackestone to 225' 225	Coring on Mud
11/8	13				225-230	4%			DOLOSTONE - Brown (10YR 5/3) F. Grained, crystalline, subhedral High Dolo-Alteration (50-90%)	6PM		*Now Coring w/ Direct-Water @ 225'
11/8	13				230-235	5%			Intergranular porosity Good induration, Medium Recrystallization	20		225-235 → hard drilling
11/13	13				235-240	34%		30%		6PM		235-245 → hard drilling
11/13	14				240-245	34%			Interbedded Mudstone 240-245' ← Mod. consodidation	20		
11/13	14	Avon Park Fm.	Upper Floridan aquifer	Moderate permeability	245-250	68%			black organic laminae 250-253	6PM	PT #1 (237-265)	245-255 → hard drilling, 3rd gear
11/13	14				250-255	68%			Interbedded Mudstone 253-255 Poorly consolidated	23		
11/26	15				255-260	%				32 GPM		255-265 → hard drilling 3rd gear loss of circ @ 262' partial circ @ 265'
11/26	15				260-265	70			GRAINSTONE - White (10YR 8/1), V. fine to med. grained, intergranular, pin-point vuggy, moldic porosity, mod ind, some fossils & organic lams		PT #2 (257-305)	
11/26	15			Moderate-Low perm.	265-270	33%				31.8		265-275 → soft drilling, no circ
11/26	15				270-275							

HYDROGEOLOGY FIELD LOG

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Site Name: Romp 8815 - Northeast Polk

Hydrogeologist: J. Tyler

Date	Box No.	Geology	Hydrogeology	Hydrostrat.	Depth (ft bls)	Recovery (%)	Lithology	Porosity (%)	Description	Test Interval	Packer Test WL, WQ, Purge Record	Notes
11/26	16	Avon Park Formation	Upper Floridan aquifer	Mod-high permeability	275 280	↑		→	As above	36.1 gpm	280 - 2-inch mud or clay layer	275-280 → soft drilling 280-282 → hard 282-285 → soft partial circ @ 285'
11/26	16				280 285	43%						
11/26	16				285 290	→				40 gpm		285-295 → soft, fast drilling, no circulation
11/26	16				290 295	9%					290' - some macro fossils	
11/24	16 / 17				295 300	↑				52 gpm	PT # 2 (295 - 305)	295-300 → soft drilling 300-305 → semi-hard
11/26	17				300 305	37%						
11/29	17			High permeability	305 310	→		15 - 30%		52 gpm		305-315 → soft drilling
11/29	17				310 315	53%						
11/29	17				315 320	→				41.4 gpm		315-325 → soft, easy drilling
11/29	18				320 325	39%						
11/30	18				325 330	91% →		↓		45.1 gpm		325-330 → soft drilling 330-335 → hard drilling

HYDROGEOLOGY FIELD LOG

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Site Name: Romp Bus - Northeast Polk

Hydrogeologist: J. Zyderk

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Date	Box No.	Geology	Hydrogeology	Hydrostrat.	Depth (ft bls)	Recovery (%)	Lithology	Porosity (%)	Description	Test Interval	Packer Test WL, WQ, Purge Record	Notes
11/30	18	Avon Park formation	Upper Floridan aquifer	High Permeability	330				330.2' DOLOSTONE, light yellowish brown (10 YR 6/4) to yellowish brown (10 YR 5/4) vf-fine to fine grained, intergranular & pinpoint vuggy & moldic porosity, 50-90% ddomite alteration, mod.-good ind	95.7 GPM	organic seams	
11/30	19				335							335-339 → hard drilling
11/30	19				340	57%			w/ interbeds of MUDSTONE/ WACKESTONE, v. pale brown (10YR 8/2)	48.3 GPM		339-340 → soft drilling
12/3	19				345							345-355 → hard drilling
12/3	20				350	47%			mouse holes in dolostone	40.7 GPM	Packer test # 3 (333-375)	
12/4	20				355			50 - 25	packstone interbed			355-365 → hard drilling
12/4	20				360	83%		1 - 10	Core alternates between dolostone & limestones as described above	47 GPM	high angle fracture in core	
12/5	21				365							365-367 → hard 370 → soft 370-375 → hard
12/5	21				370	92%				47 GPM		
12/13	22			V. high perm.	375							375-382 → hard
12/13	22				380	59%				59.6 GPM	PT #4	382-385 → hard
					385							

HYDROGEOLOGY FIELD LOG

DRAFT

Site Name: ROMP 88.5 - Northeast Polk
Hydrogeologist: J. Zydek

Date	Box No.	Geology	Hydrogeology	Hydrostrat.	Depth (ft bls)	Recovery (%)	Lithology	Porosity (%)	Description	Test Interval	Packer Test WL, WQ, Purge Record	Notes
12/13	22			High perm	385 – 390	93%			↓	45.7 GPM		385-395 → hard
12/13	23				390 – 395				↓			
12/17	23			mod.-high perm	395 – 400	93%			↓	38.6 GPM	PT #3 (398'-413')	395-402 → hard 402-404 → hard w/intermittent soft spots
12/17	24	Avon Park Formation	Upper Floridan aquifer		400 – 405				400' DOLOSTONE, pale yellow (2.5Y 7/3), intergranular & vuggy porosity, good to mod. ind., permeable			404-405 → hard
12/18	24				405 – 410				408' → DOLOSTONE, light brownish gray (2.5Y 6/2), v. fine-medium grained, intergranular and moldic porosity, good induration,		GRAINSTONE-like in texture ↳ forams undergoing dolomitization?	405-415 → hard
12/18	25				410 – 415	89%					Bivalves organic lams	
1/9/19	25			High perm	415 – 420	%				45.7 GPM	organic lams @ ~416' darken core to v. dark grayish brown (2.5Y 3/2)	415-418 → hard w/ intermittent soft spots, 418-422 hard
1/9/19	26				420 – 425	90			421.5' → Interbeds of WACKESTONE, v. pale brown (10YR 8/3 to 10YR 7/3), fine grained, intergranular & vuggy porosity, good induration, permeable			422-424 soft 424-425 hard
1/9/19	26				425 – 430	%				53 gpm		425-435 v. soft & easy drilling 432-435 hard
1/9/19	26				430 – 435	53			DOLOSTONE, as above in 408' description		PT #5 432-42?	
1/15	27		AVPK/UFA		435 – 440	93%				51 gpm		435-444 v. hard

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HYDROGEOLOGY FIELD LOG

Wellsite: Romp 88.5 Northeast Polk **Well:** Corehole **Page** 9

Hydrogeologist: J. Zidek & dLaRoche

Date	Box No.	Geology	Hydrology	Hydrostrat.	Depth (ft bls)	Recovery (%)	Lithology	Porosity (%)	Description	PT Interval	Notes
1/15	27	Avon Park Formation	Avon Park high-perm. zone	high perm.	440 445	93%				51 GPM	Driller notes: 444 - 445 hard
1/15	28				445 450	58%			High angle fractured dolostone	42.6 GPM	Driller notes: 445 - 453 Semi hard 453 - 455 hard w/ soft spots
1/15	28				450 455						
1/22	28				455 460	30%			Interbedded LS? 455.5 - 462 clay seam @ 457? 462 - 464 Dolosand (Sucrosic?) Fast drill	56 GPM	PT #5 432 - 477 Clayey LIMESTONE, white (2.5Y 8/1) to light gray (2.5Y 7/1) to gray (2.5Y 6/1) Driller Notes: 455 - 455.5 Hard 455.5 - 462 Soft easy 462 - 464 V. Soft fast drill 464 - 465 Very Hard
1/22	28				460 465						
1/23	29			very high perm.	465 470	0%			PACKSTONE/GRAINSTONE, grayish brown (2.5Y 5/2), intergranular/vuggy/possibly fracture/moldic Φ, intercrystalline to coarse-grained, 0-10% dolo alteration, good induration, organics present	62 GPM	Driller notes: 465 - 475 hard drilling
1/23	29				470 475	85%					Driller notes: 475 - 479 hard
1/24	30				475 480				As above, higher dolomite content	62.6 GPM	
1/24	30				480 485	85%					
2/5	31			high perm.	485 490				Sucrosic DOLOSTONE, pale brown (10YR 6/3), 50-90% dolomitic alteration, fine- to medium grained, intergran vuggy, & moldic Φ, moderate to poor induration organic lams throughout	98.3 GPM	Driller Notes: 485 - 495 Soft & easy
2/5	31				490 495						PT #6 485 - 525

HYDROGEOLOGY FIELD LOG

DRAFT

Wellsite: Romp 885 - Northeast Polk **Well:** Corehole **Page** 10

Hydrogeologist: J. Zydek

Date	Box No.	Geology	Hydrology	Hydrostrat.	Depth (ft bls)	Recovery (%)	Lithology	Porosity (%)	Description	PT Interval	Notes
2/5	32	Avon Park formation	Avon park high-perm. zone	V. high perm.	495				as above	62.6 gpm	
2/5	32				500	85%					
2/6					505					50.9 gpm	Driller's notes → 505 - 510.5 easy drilling 510.5 - 512 hard drilling 512 - 515 Semi-hard
2/6	33		middle confining unit I ??	high perm	510	100%					
2/6					515				~517' DOLOMITIC GRAINSTONE, light yellowish brown (2.5Y 6/4) to pale brown (10YR 6/3), intergranular, pinpoint vuggy, moldic porosity, coarse grained, biogenic clasts, 10-50% dolomite alteration, moderate induration.	40.7 gpm	Driller's notes → Soft easy drilling PT #6 489 - 525 * fragments of grayish / well indurated dolostone * organic laminae
2/4					520	0%		0%			
2/6	34			moderate to high permeability	520			20			
2/6					525	76					
2/11					525			10 -		38.4 gpm	Driller's notes → 525 - 528 very soft 528 - 535 soft, easy drilling
2/11	35				530	62%					
2/11					535				~535.8' WACKESTONE/PACKSTONE, light gray (10 YR 7/2) intergranular, pinpoint vuggy porosity micro to medium to coarse-grained, good induration, some biogenic clasts undergoing dolomitization, 0-10% dolomite alteration, organic lams ↳ interbedded mudstones	36.1 gpm	Driller's notes → 535 - 542 Soft easy drilling 542 - 545 no resistance, very easy & soft
2/12	35				540			10%			
2/12					545	46%					
2/12	36				545					38 gpm	Driller's notes → 545 - 549.5 soft easy drilling 549.5 - 551 hard
					550	72%					

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HYDROGEOLOGY FIELD LOG

Wellsite: Romp 88.5 – Northeast Polk **Well:** Corehole **Page** 11

Hydrogeologist: J. Zydek

Date	Box No.	Geology	Hydrology	Hydrostrat.	Depth (ft bls)	Recovery (%)	Lithology	Porosity (%)	Description	PT Interval	Notes
2/12	36	Avon Park Formation	middle confining unit I	mod-high perm.	550–555	72%		~10%	As above	38 gpm	551-555 Soft
2/12	36				555–560					40.7 gpm	Driller's notes → 555-562 soft easy drilling; 562-562.5 hard; 562.5-565 soft & easy
2/12	36				560–565	93%			~560' As above, more moldic/fracture ϕ, more dolomitic alteration		
2/13	37			high perm.	565–570	59%				45.7 gpm	
2/13	37				570–575						
2/15	37			moderate-high permeability	575–580	59%		10–20%		43.2 gpm; ST#8 572'–605'	Driller's notes → 575-576 very soft & easy; 576-577 semi hard; ~~577-584 soft & easy~~; 584-585 semi hard
2/15					580–585						
2/15	38				585–590					40.4 gpm	Driller's notes → 585-587 semi-hard; 587-588 soft; ~~588~~-591.5 very hard; 591.5-592 soft; 592-593 very hard; 593-595 soft
2/15	38				590–595	60%			~593' DOLOMITIC PACKSTONE/GRAINSTONE pale brown (10YR 6/3), v. fine - fine grained, intergranular, moldic, vuggy, some fracture porosity, good induration ↳ fossil molds, look like echinoids (Neolaganum dalli?) ↳ Some mouseholes ↳ Organic lams		
2/15	38				595–600					38.4 gpm	Driller's notes → soft, easy drilling all
2/15	39				600–605	35%					

HYDROGEOLOGY FIELD LOG

DRAFT

Wellsite: Romp 88.5 - Northeast Polk **Well:** Corehole **Page** 11

Hydrogeologist: J. Zydek (?)

Date	Box No.	Geology	Hydrology	Hydrostrat.	Depth (ft bls)	Recovery (%)	Lithology	Porosity (%)	Description	PT Interval	Notes
2/19	39	Avon Park Formation	MCU I	mod-high perm.	605–610	89%		10 – 20%	As above, higher DOLOMITE alteration, sucrosic, organic laminations, moldic, vuggy, fracture porosity, good induration	40.7 gpm	Driller's notes → 605-606 soft; 606-607 hard; 607-608.5 soft
2/19	39				610–615				↳ some "mouseholes" seem to		608.5-612.5 hard; 612.5-615 semi-hard
2/19	40			very high permeability	615–620	80%			have been filled w/ mineral content prior, & since dissolved. Holes	50.9 gpm	Driller's notes → 615-617.5 hard; 617.5-619.5 semi-hard; 619.5-621.5 hard
2/19	40				620–625				look conchoidal ↳ fossil molds look like neolaganum dalli & possibly Spirolina coryensis		621.5-623.5 semi-hard; 623.5-625 hard
2/19	41		L. Floridan aquifer below MCU I	mod-low perm.	625–630	79%			& brachiopods ~625 mousehole ~628 high angle fractures	27.9 gpm	Driller's notes → 625-627.5 hard; 627.5-623.5 soft; 623.5-632 hard
2/19	41				630–635						632-634 soft & easy; 634-635 hard
2/20	41			mod-high perm.	635–640	68%		10%	↳ ~636: similar to above, but less dolomitic alteration	93 gpm	Driller's notes → 635-640 hard; 640-642 soft; 642-645 hard
2/20	42				640–645				As above (Sucrosic dolostone)		
2/21	42			high perm.	645–650	34%			↓	45.7 gpm	Driller's notes → 645-647.5 hard; 647.5-655 very soft
2/21	42				650–655				↓		
2/22	43				655–660	67%			↓		Driller's notes → 655-659 soft; 659-661 hard; 661-665 soft

PT Interval: Packer test #9 605' - 645'

HYDROGEOLOGY FIELD LOG

DRAFT

Wellsite: Romp 88.5 – Northeast Polk **Well:** Corehole **Page** 12

Hydrogeologist: J. Zydek

Date	Box No.	Geology	Hydrology	Hydrostrat.	Depth (ft bls)	Recovery (%)	Lithology	Porosity (%)	Description	PT Interval (air lift gpm)	Notes
2/22	43				660–665	67%			As above		
2/22	43				665–670					45.7 gpm	Driller's notes → 665-666.5 semi-hard 666.5-672.5 easy but slow due to barrel trying to clog 672.5-673.5 hard 673.5-675 soft & easy
2/22	43		Lower Floridan aquifer below MCU I	high permeability	670–675	53%					
2/25	44	Avon Park Formation			675–680			10% – 40%	Dolomitic Pack/Grainstone inter/intragranular porosity very fine - fine grained biogenic grains moderate induration vedded light tan (10YR 8/1 → 10YR 6/3)		Driller's notes → 675-679 soft 679-680 hard
2/25	44				680–685						680-683 hard 683-684 soft 684-685 hard
7/3	44				685–690					43.2 gpm	Driller's notes → 4th gear 11.5 gpm
7/3	44				690–695	26%					
7/8	45				695–700					45.7 gpm	Driller's notes → 3rd gear 9 gpm very fast cutting
7/8	45				700–705	29%					
7/8	45			very high perm.	705–710					50.9 gpm	Driller's notes → drillin 2nd gear 8.3 gpm
7/8	45				710–715	15%					

DRAFT

HYDROGEOLOGY FIELD LOG

Wellsite: Romp 88.5 - Northeast Polk **Well:** Corehole **Page** 13

Hydrogeologist: J. Elder

Date	Box No.	Geology	Hydrology	Hydrostrat.	Depth (ft bls)	Recovery (%)	Lithology	Porosity (%)	Description	airlift gpm / PT Interval	Notes
7/8	45	Avon Park Formation	Lower Floridan aquifer below MCU I	mod-high perm.	715–720				bed of moldic/pin-point vugular pack/grainstone 10YR 7/4–6/4 ~5ft	36.1 gpm	Drillers notes → 1st gear 715–720, 720–725 hard, 3rd gear
7/8	45				720–725	65%					
7/10	46			low-moderate perm.	725–730					26.1 gpm	Drillers notes → 1 foot cave in 725–728 soft, 728–735 layered hard–soft
7/10	46				730–735	70%			as above		
					735–740			15%	Dolomitic wacke-packstone intergranular, moldic, & pin-point vugular v.fine – med. grains, biogenic	45.7 gpm	Drillers notes → 1 foot cave in hard 735–736, soft 736–745
					740–745	80			moderate – poor induration bedded some bivalves & gastropod fossil molds 2.5Y 8/3 – 7/3		
				high permeability	745–750				recurring 1-2in portions of organic laminations	48 gpm	Drillers notes → 745–755 soft
					750–755	73%					
					755–760						Drillers notes → 755–760 soft, 760–763 very soft, 763–765 hard
					760–765	66%			as above		
7/15	49				765–770	82%				40.7 gpm	Drillers notes → 765–773 hard, 773–774 very soft, 774–775 hard

HYDROGEOLOGY FIELD LOG

DRAFT

Wellsite: ROMP 88.5 – Northeast Polk **Well:** Corehole **Page** 14

Hydrogeologist: J. Zydek

Date	Box No.	Geology	Hydrology	Hydrostrat.	Depth (ft bls)	Recovery (%)	Lithology	Porosity (%)	Description	Airlift gpm [PT Interval]	Notes
7/15	49	Avon Park Formation	Lower Floridan aquifer below MCU I	high permeability	770–775	82%			↓	94.7 gpm	
7/16	50				775–780	62%		30%	Dolo/Limestone Grainstone (last ~1ft mud/wackestone), v. fine → fine, biogenic, moderate induration, bedded, bivalves & gastropods, pale yellow (2.5Y 8/3–7/3), moldic/intergranular/intragranular	93.2 gpm	Driller's notes → 775–780 hard, 780–783 soft
7/16	50				780–785						
7/16	50			very high perm.	785–790	78%		15%	Dolomitic Wacke/packstone, v. fine → fine, biogenic, moderate induration, bedded, pin-point vugs/fracture, bivalves, v. pale brown (10YR 8/2)	55 gpm	Driller's notes → HQ dropped 0.5 feet, 785–790 hard, 790–792 soft, 792–795 hard
7/16	51				790–795			25%	↓		
7/17	51			high permeability	795–800	78%		15%	↳ Large dolo/calcite crystals. Same as above		Driller's notes → HQ dropped 1 foot
7/17	51				800–805			↓	↓		
7/18	52				805–810	99%				45.7 gpm	Driller's notes → 805–806 hard, 806–810 soft, 810–815 hard
7/18	52				810–815						
7/18	53				815–820	95%				48 gpm	Driller's notes → soft run
7/18	53				820–825				↳ Some clayey inclusions ↓		

DRAFT

HYDROGEOLOGY FIELD LOG

Wellsite: Romp 88.5-Northeast Polk **Well:** Corehole

Hydrogeologist: J. Zydek

Date	Box No.	Geology	Hydrology	Hydrostrat.	Depth (ft bls)	Recovery (%)	Lithology	Porosity (%)	Description	PT Interval	Notes
7/19	54	Avon Park formation	Lower Floridan aquifer below MCU I	high perm.	825 – 830	↑ 60%		25%	↳ decrease in induration	45; 7 gpm	Driller's notes → very soft 825–834.5 hard last 6 feet
7/19	54				830 – 835	↓					
7/19	54			very high perm.	835 – 840	↑				50.9 gpm	Driller's notes → soft run
7/19	55				840 – 845	↓ 65%			↳ increase in induration		
7/23	55			high perm.	845 – 850	↑				45.7 gpm	Driller's notes → soft run
7/23	55				850 – 855	↓ 70%					
					855 – 860				Packstone, fine-crnse, pin-point vugs, moderate-poor induration dolo / fracture 10YR 7/4, v. pale brown.		Driller's notes → not coring properly 855–859 0% recovery trip out to check bit
					860 – 865						
					865 – 870						
					870 – 875						
					875 – 880			↑ 98%			

DRAFT

HYDROGEOLOGY FIELD LOG

Wellsite: Romp 99.5 - Northeast Polk **Well:** Corehole **Page** 1/6

Hydrogeologist: J. Zydek & M. Thanke

Date	Box No.	Geology	Hydrology	Hydrostrat.	Depth (ft bls)	Recovery (%)	Lithology	Porosity (%)	Description	~~gpm~~ PT Interval	Notes
8/6		Avon Park Formation	lower Floridan aquifer below MCU I	mod-high perm	880–885	88%		30–35%	↓	38.9 gpm	#16
8/8				High perm.	885–890				↳ Large vugs appear, infilled w/ evaporite crystals ↳ @ 889 – switch to Limestone, qz. crystals in vugs.	49 gpm	Driller's Notes → 885–893 smooth easy drilling, 893–895 harder drilling
8/8					890–895				↳ back to dolostone @ 895, mod. induration		
8/12				moderate to high permeability	895–900	↑			↳ good induration. Layers of organics, evaporite crystals in vugs. (calcite)	37 gpm	Driller's Notes → hard run
8/12	60				900–905	88% ↓			↓		
8/12	60				905–910	↑				30 gpm	Driller's Notes → hard run
8/12	61				910–915	99% ↓					
8/13	61				915–920	↑				37 gpm	Driller's Notes → 915 – 922 hard drilling, 922 – 923.5 hard drilling
8/13	62				920–925	97% ↓		10–40%	↓		
8/13	62				925–930	↑			Wackestone lmst, vugs/pinpoint vugs/fracture, v.fine-fine grains, banded w/ organics, moderate induration, 10-40% porosity.	31.8 gpm	Driller's Notes → Easy drilling
8/13	63				930–935	99% ↓			↳ ↑ to well indurated @ 931'		

HYDROGEOLOGY FIELD LOG

DRAFT

Wellsite: Romp 88.5 - Northeast Polk **Well:** Core hole **Page** 17

Hydrogeologist: J. Zydek & H. Fanke

Date	Box No.	Geology	Hydrology	Hydrostrat.	Depth (ft bls)	Recovery (%)	Lithology	Porosity (%)	Description	PT Interval	Notes
8/19	63	Avon Park Formation	lower Floridan aquifer below unit I	mod-high perm.	935 – 940	↑			↳ dec. grain size: microcrystalline-fine inc. induration: med.-well indurated. some organic beds. ↓	34 gpm	Driller's Notes → hard drilling
8/19	64				940 – 945	100% ↓					
8/20	65			mod-low permeability	945 – 950	↑				26 gpm	Driller's notes → hard drilling
8/20	65				950 – 955	99% ↓					
8/20	66				955 – 960	↑				26 gpm	Driller's notes → hard drilling
8/20	66				960 – 965	100% ↓					
8/26	67			Moderate-high permeability	965 – 970	↑				30 gpm	Driller's notes → hard drilling
8/26	67				970 – 975	100% ↓					
8/26	68				975 – 980	↑				30 gpm	Driller's notes → 975-983 hard drilling 983-985 v. hard (20 min)
8/26	68				980 – 985	100% ↓			982.7 DOLOMITIC LIMESTONE/DOLOSTONE (~90% alteration), light gray (10YR 7/2), massive gypsum/anhydrite filled vugs, mouseholes & beds, well-good ind., pinpoint vuggy & moldic porosity		
8/27	69				985 – 990	100%		~25%		30 gpm	Driller's notes → 985-988 hard 988-992.5 v. hard 992.5-995 hard

HYDROGEOLOGY FIELD LOG

DRAFT

Site Name: Romp 88.5 – Northeast Polk

Geologist: J. Zydek

Date	Box No.	Geology	Hydrogeology	Hydrostrat.	Depth (ft bls)	Recovery (%)	Lithology	Porosity (%)	Description	airlift gpm	Packer Test WL, WQ, Purge Record	Notes
8/27		Avon Park formation	middle confining unit II	moderate to low permeability zone	990 995	100%				30 gpm		
8/27					995 1000					27.9 gpm		995-1001 semi hard
8/27					1000 1005	100%						1001-1005 hard w/ soft spots
					1005 1010							1005-1012 semi-hard
					1010 1015	100%		0				1012-1014 Softer 1014-1015 semi-hard
					1015 1020			5	~1015' DOLOMITIC LIMESTONE, light gray (10YR 7/2), intergranular, pinpoint vuggy, moldic porosity. Some organic laminae, good to well induration, 0-10% dolomite altering some gypsum/anhydrite infilling pore spaces, V. fine-grained, Chalky	27.9 gpm		
					1020 1025	100%		1				
	74				1025 1030			10				
	74				1030 1035	100%				29.2 gpm		
9/17	75				1035 1040			5	~1037' As above, mod-good ind, more massive gypsum/anhydrite filled vugs	27.9 gpm		1035-1039 V. hard
9/17	75				1040 1045	100%		0				1039-1040 Softer 1040-1045 V. hard w/ softer spots

HYDROGEOLOGY FIELD LOG

DRAFT

Site Name: ROMP 88.5 NE Polk

Geologist: J. Zydek

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Date	Box No.	Geology	Hydrogeology	Hydrostrat.	Depth (ft bls)	Recovery (%)	Lithology	Porosity (%)	Description	airlift gpm	Packer Test WL, WQ, Purge Record	Notes
9/17					1045 – 1050	100%		0-5%	~1050', As above, very large 1-2 foot segments w/ mouse hole size vugs filled w/ gypsum & anhydrite	26.1gpm		1045-1048 v. hard 1048-1051 softer & semi-hard
9/17					1050 – 1055	100%		0-5%		26.1gpm		1051-1055 v. hard
11/5		Avon Park formation	middle confining unit II	moderate to low permeability	1055 – 1060			10-15%		24.2gpm		very hard run
11/5					1060 – 1065	100%						1065-1066 hard 1066-1067 hard but easy cutting 1067-1071 hard 1071-1073 easier drill 1073-1075 hard
11/7					1065 – 1070							
11/7	79				1070 – 1075	100%						
11/12	79				1075 – 1080							1075-1078 very hard 1078-1083 softer driller but still hard
11/12	80				1080 – 1085	100%						1083-1085 hard
11/13	80				1085 – 1090				As above, core is iron stained from ~1085 to ~1110 feet bls	22.6gpm		1085-1093 hard
11/13	81				1090 – 1095	100%						1093-1095 softer
11/13	81				1095 – 1100	100%				20.2gpm		1095-1097 soft drilling

HYDROGEOLOGY FIELD LOG

DRAFT

Site Name: Romp 88.5 - Northeast Polk

Geologist: J. Zydek

Date	Box No.	Geology	Hydrogeology	Hydrostrat.	Depth (ft bls)	Recovery (%)	Lithology	Porosity (%)	Description	airlift gpm	Packer Test WL, WQ, Purge Record	Notes
11/13	82	Avon Park formation		moderate to low permeability	1100	100%		15-20		20.9 gpm		1097-1105 hard drilling
					1105							
11/20	82				1105							1105-1110 smooth & steady
					1110							
11/20	83				1110	99%			~1111' as above, large moldic sized vug filled w/ gypsum/ anhydrite			1110-1115 very hard drilling
					1115							
12/2	83				1115				~1118' as above, gypsum filled fossil molds become more prolific			very hard drilling
					1120							
12/2	84				1120	100%		10-15				
					1125							
12/3	84				1125							hard drilling
					1130							
12/3	85				1130	99%						
					1135							
12/3	86				1135							1135-1140 hard
					1140							
12/3	86				1140	99%		0-5%				1140-1143 very hard 1143-1143.5 soft 1143.5-1145 hard
					1145							
12/4	87			Low permeability	1145					19.4 gpm		
					1150							
12/4	87				1150	100%						very hard
					1155							

HYDROGEOLOGY FIELD LOG

DRAFT

Site Name: Romp 88.5 - Northeast Polk

Geologist: J. [illegible]

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Date	Box No.	Geology	Hydrogeology	Hydrostrat.	Depth (ft bls)	Recovery (%)	Lithology	Porosity (%)	Description	airlift gpm	Packer Test WL, WQ, Purge Record	Notes
12/4	87 / 88	Avon Park Formation	middle confining unit II	low Permeability	1155–1160	↑		0-5%	Cribrobulimina Cushmani fossils. Spirolina Coripensis fossils. Anhedral or Cryptocrystalline Dolomite. Light cream to brown gradient with depth. Increased porosity with depth. No fizz.	19.4		1155–1165 All hard drilling
12/4	88				1160–1165	100%		0-5%	Gypsum embedded in dolomite. No fizz. Spirolina Coripensis or Gunteria floridana fossils. Almost no porosity due to minerals.			
2020 1/22	89				1165–1170	↑		0-5%	Much darker cryptocrystalline dolostone. Some conchoidal fracture. Slightly more porosity. Small amount of anhydrite in spots. No fossils present.	17.8		1165–1175 Semi-hard run, bit keeps trying to plug
1/22	89				1170–1175	100%		5-10%	Light brown dolostone. Gypsum deposits throughout. Platy cleavage showing in some mineral deposits. Dolostone breaking up around gypsum. No fossils.			
1/22	90				1175–1180	↑		0-3%	Cream-color dolostone. Conchoidal fracture in some places creating chert-like appearance. Blue/gray lines of precipitate minerals inside. No fossils.	19.4		1175–1185 hard drilling
1/22	90				1180–1185	100%		0-10%	About 25% gypsum in dolostone. Color turns from light cream to brown.			
1/23	91				1185–1190	↑		↓	↓	17.8		1185–1195 very hard drilling
1/23	92				1190–1195	100%		↓	↓			
9/10/20	92				1195–1200	↑		↓	↓	19.9		1195–1200 semi-hard
9/10	92 / 93				1200–1205	100%		↓	↓			1200–1205 very hard
9/10	93				1205–1210	100%		↓	As above, less observable porosity, fewer fossils	19.8		1205–1207 Core 2 feet to get UDR numbers correct for core run

HYDROGEOLOGY FIELD LOG

DRAFT

Site Name: Romp 88.5 - Northeast Polk

Hydrogeologist: J. Zydek

Date	Box No.	Geology	Hydrogeology	Hydrostrat.	Depth (ft bls)	Recovery (%)	Lithology	Porosity (%)	Description	Test Interval	Packer Test WL, WQ, Purge Record	Notes
9/10	94	Avon Park Formation	middle confining unit II	Low Permeability	1210–1215	100%		5–10%	DOLOSTONE, light gray (10YR 7/1 - 10YR 7/2), very fine grained, intergranular, pin-point vugular porosity, good induration		~ half foot bed of gypsum	
9/10	94				1215–1220	100%			↓			
9/10	95				1220–1225	100%		8–10%	DOLOMITIC LIMESTONE, some dolomitic alteration, gray (10YR 6/1) to light brownish gray (10YR 6/2), intergranular, vuggy, moldic porosity, good induration. Secondary calcite & evaporites filling pore spaces. Gypsum filling in moldholes.		organic laminae & fractures filled w/ gypsum	
9/10	95				1225–1230	100%						1227–1237 hard drilling w/ intermittent soft spots
9/16	96				1230–1235	100%				19.4 (Packer test #21)		
9/16	96				1235–1240	100%						1237–1247
9/16	97				1240–1245	100%						hard drilling
9/16	97				1245–1250	100%						1247–1257 hard drilling
9/17	98				1250–1255	100%					1250–1252 almost entire section is all gypsum	
9/17	99				1255–1260	100%			~1258' fracture-vein infilled w/ gypsum ~1259' DOLOSTONE is more sucrosic	19.4		1257–1267 hard drilling
9/17	99				1260–1265	100%						

HYDROGEOLOGY FIELD LOG

DRAFT

Site Name: ROMP 88.5 - NE Polk

Hydrogeologist: J. Zydek

Date	Box No.	Geology	Hydrogeology	Hydrostrat.	Depth (ft bls)	Recovery (%)	Lithology	Porosity (%)	Description	Test Interval / Air Lift GPM	Packer Test WL, WQ, Purge Record	Notes
9/17 10/1	100	Avon Park Formation	MCU II	low permeability	1265–1270	0%	Gypsum		Lt. brown/gray dolostone and gypsum w/organic black veining, very well indurated	19.4	PT #22 1262-1307	1267-1277 hard drilling
10/1	100				1270–1275	100	Gypsum		brown to gray dolostone w/gypsum, brown slightly sucrosic + ~10% porosity			
10/1	101		aquifer below II-9		1275–1280		Gypsum		brown/gray dolostone w/very large gypsum sections, especially at end also some gypsum in veins, porosity 0-5%			1277-1282 hard
10/1	101 102				1280–1285	100%			more dolostone w/ smaller gypsum, more porous than before (~5%)			1282-1285 softer/easier drilling 1285-1287 hard
10/1	102				1285–1290	0%	Gypsum		Dolo more porous again (brown/gray) ~10% large section of gypsum. 20% porosity @ 1288			1287-1292 hard
10/1	102 103				1290–1295	100	Gypsum		Brown porous dolostone w/some gypsum, porosity ~10%			1292-1297 hard but easy drilling
10/1	103		Lower Floridan aquifer		1295–1300	0%			gray dolostone (slightly sucrosic), some gypsum nodes. Becomes less sucrosic w/depth, and pores tend to fill w/gypsum			1297-1307 hard but easy drilling
10/1	104				1300–1305	100	Gypsum		Lt. brown/gray dolostone ~10% porosity and some gypsum veins/nodes, one solid section of gypsum @~1304			
10/7	104			mod-low perm	1305–1310	0%			gray dolostone (poorly indurated @ ~1307) w/relatively high (~10%) porosity and some medium gypsum nodes (poss. selenite	24.2	@ 1307 PT #23 1307-132?	1307-1315 hard but easy drilling
10/7	105				1310–1315	100			Lt. brown well-indurated dolostone w/gypsum (veins favored) porosity ≤5%			1315-1317 hard drilling
10/7	105				1315–1320	100%			gray/lt. brown dolostone transitioning to brown sucrosic dolostone w/depth porosity: 5-10%			1317-1321 semi hard

HYDROGEOLOGY FIELD LOG

DRAFT

Site Name: ROMP 88.5
Hydrogeologist: C. Hale

Date	Box No.	Geology	Hydrogeology	Hydrostrat.	Depth (ft bls)	Recovery (%)	Lithology	Porosity (%)	Description	Test Interval	Packer Test WL, WQ, Purge Record	Notes
10-7	106	Avon Park Formation	Lower Floridan aquifer below II-a	moderate to low permeability	1320 – 1325	100			highly sucrosic porous brown dolostone, ~10% porosity, becomes light grey sucrosic and still porous. <5% gypsum	29.2; PT #23 1307 – 1344		1321-1324 very soft
10/7 10/13	106 107				1325 – 1330				light gray to light brown slightly sucrosic dolostone, 10-5% porosity			1324→1327 semi hard
10/13	107				1330 – 1335				Dolostone, lt. brown, 5-10% porosity sucrosic as depth increases, gypsum @~1333			1327-1332 → soft & easy
10/13	107				1335 – 1340				Dolostone, lt. brown w/precipitated gypsum and some mica, black laminae at ~1335 indicating high organics			1332-1337 → hard
10/13	108				1340 – 1345		Gypsum; Gypsum		begins lt. brown dolostone, solid gypsum ~1 ft. chunks further down then back to dolostone w/gypsum node			1337-1344 hard drilling
10/14	108 109				1345 – 1350		Gypsum		solid gypsum → dolostone w/ gypsum nodes, very fine-grained dolostone (lt. gray)	PT #24 1339-1382		1347-1357
10/14	109				1350 – 1355		Gypsum; Gypsum		large gypsum node w/organic lamina, then changes to brown sucrosic dolostone and another solid gypsum			hard run
10-14	110				1355 – 1360				brown/gray sucrosic dolostone, including gypsum nodes. ~5% porosity for dolo			
10-14	110				1360 – 1365				gray/brown dolostone, slight resinous lustre w/some gypsum nodes. low permeability at bottom, higher at top.	26	Some sucrosity evident in pores	1357-1364 → fast
10/14 10/15	111				1365 – 1370				gray to brown dolostone, high gypsum @ top. extensive organic laminae/veins further down			1364-1367 → hard
10-15	111 112				1370 – 1375				gray dolostone w/some gypsum, becomes more brown/sucrosic at bottom ~5% porosity, can see dark organic impurity but not clear veins			1367-1377 → hard drilling, 1376 to 1377 soft & easy

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HYDROGEOLOGY FIELD LOG

Site Name: ROMP 88.5 - Northeast Polk

Geologist: J Zydek

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Geology: Avon Park Formation
Hydrogeology: Lower Floridan aquifer below II-a
Hydrostrat.: moderate to low permeability

Date	Box No.	Geology	Hydrogeology	Hydrostrat.	Depth (ft bls)	Recovery (%)	Lithology	Porosity (%)	Description	airlift gpm	Packer Test WL, WQ, Purge Record		Notes
10/15	112	Avon Park Formation	Lower Floridan aquifer below II-a	moderate to low permeability	1375–1380			20%	1377' DOLOSTONE, v. pale brown (10YR 8/2) to light gray (10YR 7/2), good induration, fine-v. coarse grained intergranular, intragranular, pinpoint, vuggy porosity, 80-90% dolomitic alteration	26	PT #24 1377-1387	Mouse-hole sized gypsum-filled vugs	1377-1387 → soft & easy drilling
10/15	112				1380–1385	100%							
10/15	113				1385–1390								1387-1390 hard
10/21	113 / 114				1390–1395	100%			GRAINSTONE, v. pale brown (10YR 8/2), good ind., coarse grained, inter/intragranular & moldic porosity, secondary calcite xtls forming in void spaces		1377-1422X	fossil molds	1390-1395 very soft, no resistance, 1395-1397 hard
10/21	114				1395–1400				DOLOSTONE, light gray (10YR 7/2) to light brownish gray (10YR 6/2), v. good induration, intergranular, moldic porosity, calcite xtls infilling vugs			Mouseholes filled w/ gypsum	1397-1407 hard run
10/21	115				1400–1405	100%							
10/21	115				1405–1410				1407' DOLOSTONE, light brownish gray (10YR 6/2) to grayish brown (10YR 5/2), v. good ind., intergranular, moldic, pinpoint, vuggy porosity, sucrosic, coarse grained				1407-1414 hard, 1414-1417 soft
10/21	116				1410–1415	100%		2-5%	1410, GRAINSTONE, light gray (10YR 7/1) to gray (10YR 6/1) good ind., fossils & calcite xtls	23	PT #25		
10/21	116				1415–1420							minimal gypsum, fossils hard to ID	1417-1425 soft, 4 minutes, 1425-1427 hard, 7 minutes
10/21	117				1420–1425	100%							
10/26	117				1425–1430	100%			sucrosic DOLOSTONE, similar description as 1407' description	24.2			1427-1432 hard, 1432-1437 soft

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HYDROGEOLOGY FIELD LOG

Site Name: ROMP 98.5 - Northeast Polk

Geologist: J. Zydek

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Date	Box No.	Geology	Hydrogeology	Hydrostrat.	Depth (ft bls)	Recovery (%)	Lithology	Porosity (%)	Description	airlift gpm	Packer Test WL, WQ, Purge Record	Notes
10/26	118	Avon Park Formation	Lower Floridan aquifer below II-a	moderate to low permeability	1430 – 1435	100%				↑		
10/26	118 / 119				1435 – 1440					24.2		1437 - 1442 soft, 1442 to 1447 hard
10/26	119				1440 – 1445	100%				↓	* Gypsum filled worse= holes return	
10/26 / 10/27	120				1445 – 1450					↑	*selenite??	1447 - 1457 hard drilling with soft spots
10/27	120				1450 – 1455	100%						
10/27	121				1455 – 1460					22.6		1457 - 1467 very hard drilling
10/27	121				1460 – 1465	100%				↓		
10/27	122				1465 – 1470					↑		1467 - 1477 hard drilling
10/27	122				1470 – 1475	100%						
10/27	123				1475 – 1480					23.8		1477 - 1487 hard drilling
10/27	123 / 124				1480 – 1485	100%				↓		

HYDROGEOLOGY FIELD LOG

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Site Name: ROMP 88-5 – NE Polk

Geologist: J. Zydek

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Date	Box No.	Geology	Hydrogeology	Hydrostrat.	Depth (ft bls)	Recovery (%)	Lithology	Porosity (%)	Description	airlift gpm	Packer Test WL, WQ, Purge Record	Notes
10/27, 10/29	124	Avon Park Formation	Lower Floridan aquifer below [illegible]	moderate to low permeability	1485–1490	X				23.8		1477–1487 hard drilling
10/29	124, 125				1490–1495	100%				↑		1487–1495 easy drilling
10/29	125				1495–1500	X						1495–1497 hard
10/29	126				1500–1505	100%						1497–1507 hard drilling
11/2	126				1505–1510	X						1507–1517 hard but easy drilling
11/2	127				1510–1515	100%		25%	1511', PACKSTONE, very pale brown to light gray (10YR 8/2 – 10YR 7/2), good ind., med. grained, calcite & evaporites present in matrix, intergranular porosity		fossils present, miliolids, helicostegina gyralis?	
11/2	127				1515–1520	X				20.9		1517–1527 rig-induced hard drilling
11/2	128				1520–1525	100%			1521', core begins to undergo dolomitization, dark grayish brown (10YR 4/2), vugular porosity infilled w/ gypsum			
11/3	128				1525–1530	X		~20%	1527' abrupt change back to fossiliferous packstone, large oyster-like fossils			1527–1532 Split-run, HQ casing dropping, F-SS rods not stabilized
1/19	129				1530–1535	100%		0%	1534' DOLOSTONE, grayish brown (10YR 5/2), [illegible] indurated, pinpoint vugs, intercrystalline porosity, some [illegible] holes filled w/ gypsum, vugs also filled w/ calcite, some visible fossil frags			1532–1537 hard drilling, switch to [illegible] rods
1/19, 1/20	129, 130				1535–1540	100%		4, 6		↓	1535'–1536 large gypsum bed	

HYDROGEOLOGY FIELD LOG

DRAFT

Site Name: Rompp 6.5 - NE Park

Geologist: J. Zydek & A Hale

Date	Box No.	Geology	Hydrogeology	Hydrostrat.	Depth (ft bls)	Recovery (%)	Lithology	Porosity (%)	Description	airlift gpm	Packer Test WL, WQ, Purge Record	Notes
1/20	130	Avon Park Formation		low permeability to moderate	1540 1545	100%		~5-10%	As above large gypsum section w/ 1564-1565 ft light gray to light brown dolomitic wackestone w/ gypsum inclusions (~10%), mostly well-indurated, some organic veins some organic veins	20.9 19.4		1537-1547 very hard drilling
1/20	130				1545 1550	*						1547-1557 hard drilling
2/3	131				1550 1555	100%						
2/3	132				1555 1560	*						1557-1567 hard drilling
2/3	132				1560 1565	100%						
2/3	133				1565 1570	*						1567-1577 hard drilling
2/4	133				1570 1575	100%						
2/4	134				1575 1580	*						1577-1587 hard drilling
2/16	134				1580 1585	100%						
2/16	135			low perm	1585 1590	*						1587-1597 hard drilling
2/16	135 136				1590 1595	100%						

HYDROGEOLOGY FIELD LOG

DRAFT

Site Name: ROMP 88.5 – NE Polk

Geologist: J. Zydek & C. Hale

Date	Box No.	Geology	Hydrogeology	Hydrostrat.	Depth (ft bls)	Recovery (%)	Lithology	Porosity (%)	Description	airlift gpm	Packer Test WL, WQ, Purge Record	Notes
2/17/21	136	Avpk Fm			1595–1600	X		0–5% (1595–1650)	Light gray – light brown dolostone w/ gypsum nodyles (well-indurated)	19.4 (1595–1650)		1597–1600 hard
2/17	137	Oldsmar Formation (1600–1650)	gmic ?? (1600–1650)	low permeability (1600–1650)	1600–1605	100%			-1602', WACKESTONE, white to pale brown (10YR 8/1 – 10YR 6/3), good ind., v. fine grained, pinpoint vugular porosity, some fossil frags but hard to identify		- Hi gyralis?	1600–1605 softer & easier
2/17	137				1605–1610	X			-1607', MUDSTONE, white (10YR 8/1), mod. ind., v. fine - silt grained, intergranular porosity, some fossil frags, possible H. gyralis, some gypsum-filled vugs			1605–1606 hard; 1606–1607 easy & softer
2/17	138				1610–1615	100%					~1612.5' large gypsum filled moldic hole	1607–1617 hard drilling
2/17	138				1615–1620	X					~1615' Helicostegina gyralis	1617–1625 hard & steady drilling
2/17	139				1620–1625	100%						1625–1627 hard slow drilling
2/17	139				1625–1630	X						1627–1637 hard drilling
2/18	140				1630–1635	100%					* coral	
2/18	140				1635–1640	X			~1637.5 → DOLOSTONE, light brownish gray to pale brown (10YR 6/2 – 10YR 6/3), good ind., fine-grained, intergranular porosity, some organic laminae, possible H. gyralis present. Pin point vugs, gypsum filled vugs			1637–1647 hard drilling
2/18	141				1640–1645	100%						
2/25	141				1645–1650	X						1647–1648 partial run, check & replace bit w/ NQ N 60/40 step; 1648–1651 hard drilling

HYDROGEOLOGY FIELD LOG

Site Name: ROMP 88.5 – Northeast Polk

Geologist: J. Zydek

DRAFT

Date	Box No.	Geology	Hydrogeology	Hydrostrat.	Depth (ft bls)	Recovery (%)	Lithology	Porosity (%)	Description	airlift gpm	Packer Test WL, WQ, Purge Record	Notes
2/25/2[illegible]	142				1650–1655	88%			-1651'; WACKESTONE, white (10YR 8/1), mod. ind., fine-grained, intergranular porosity, organic lams. Core is broken up into wafer, disk-like chunks	↑	*possible H. gyralis	1651–1657 hard but easy drilling
2/25	142				1655–1660							1657–1667 quick, easy drilling
2/25	143	Oldsmar Formation		low permeability	1660–1665	100%		10–20%				
2/26	143 / 144				1665–1670					19.4		1667–1677 smooth, easy drilling
2/25	144				1670–1675	100%						
5/25	145				1675–1680							1677–1687 Steady, hard drilling
5/25	145				1680–1685	100%						
5/25	146				1685–1690							1687–1697 hard drilling
5/25	146				1690–1695	100%						
5/25 6/9	147				1695–1700				– as above, visible porosity increase, organic lams			1697–1707 hard run
6/9	147				1700–1705			30%		↓		

HYDROGEOLOGY FIELD LOG

DRAFT

Site Name: Romp 88.5- Northeast Polk
Geologist: J. Eydek

Date	Box No.	Geology	Hydrology	Hydrostrat.	Depth (ft bls)	Recovery (%)	Lithology	Porosity (%)	Description	Test Interval (airlift gpm)	Packer Test WL, WQ, Purge Record	Notes
6/9/21	148	Oldsmar Formation	(FAS-B)	low-mod. perm.	1705–1710	X			As above ↓	24.2		1707-1712 Soft run
6/9	148 / 149				1710–1715	100%			↓			
6/9	149			very high perm.	1715–1720	X			↓			1717-1725 soft; 1725-1727 hard
6/9	150				1720–1725	100%			-1722, MUDSTONE-PACKSTONE, light gray to light brownish gray (10YR 7/1 to 10YR 6/2), poor to moderate induration, intergranular to vuggy porosity, poor sample, gravelly, some fossil molds, mottled core, medium grained	53.75		
6/9	150				1725–1730	X			*Core is more sucrosic			1727-1733 changed bit 50/60 5step
6/9 6/15	151				1730–1735	100%						soft run due to bit block 1733-1737 Soft run
6/16	151			high permeability	1735–1740	X			Induration improves, core is more wackestone vuggy & moldic porosity, porosity decreases -1732, half foot clay layer, greenish gray (GLEY2 6/1)			1737-1747 soft drilling
6/16	152				1740–1745	100%						
6/16	152				1745–1750	X				78.3		1747-1755 soft; 1755-1757 very fast
6/16	153				1750–1755	100%						
6/23					1755–1760	X 100%						1757-1767 Soft run

HYDROGEOLOGY FIELD LOG

DRAFT

Site Name: ROMP 88.5 - Northeast Polk

Geologist: J. Tyler

Date	Box No.	Geology	Hydrology	Hydrostrat.	Depth (ft bls)	Recovery (%)	Lithology	Porosity (%)	Description	Test Interval gpm/ft gpm	Packer Test WL, WQ, Purge Record	Notes
				Mod - high perm	1760	100%						1757 - 1767 Soft run
					1765							
					1765							1767 - 1775 Very Soft
					1770	100%				36.1		1775 - 1777 hard
					1775							
					1775							1777 - 1784 hard
					1780							
					1780							1784 - 1787 Soft
					1785							
					1785					45.7		1787 - 1792 Soft drilling
					1790							
					1790							
					1795							
					1795							1792 - 1805 Very Soft
					1800							
					1800							1805 - 1807 hard
					1805							
					1805							
					1810							
					1810							
					1815							