

APPENDICES

APPENDICES

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APPENDIX I: Injection Test Data

**APPENDIX A**

APPENDIX A

- A1 Geologic Log of Injection Well #1
- A2 Geologic Log of Lower Floridan Aquifer Monitor Well
- A3 Geologic Log of Deep Monitor Well
- A4 Geologic Log of Shallow Monitor Well

GEOLOGIC LOG  
OF  
INJECTION WELL - 1  
CITY OF MELBOURNE  
MELBOURNE, FLORIDA

<u>Depth Interval (feet)</u>	<u>Thickness (feet)</u>	<u>Sample Description</u>
0 - 60	60	SAND WITH SHELL - Sand, 80%, medium gray to colorless, quartz, medium-grained, sub-rounded; Shell fragments, 20%, pale yellowish orange to white to medium dark gray, medium-sized fragments; Sand, trace, black, phosphatic, very fine-grained, sub-rounded.
60 - 80	20	SHELL WITH SAND - Shell, 70%, yellowish orange to medium gray, medium-sized fragments; Sand, 30% frosted to colorless, quartz, fine- to medium-grained; Sand, trace, phosphatic, dark gray to black, very fine-grained, sub-rounded.
80 - 110	30	SANDY SHELL WITH LIMESTONE - Shell, 70%, very pale orange to dark gray, medium- to large-sized fragments; Limestone, 20%, light olive gray, biosparite, moderately hard; Sand 10%, colorless, quartz, medium- to fine-grained, subrounded; Sand, trace, black, phosphatic, very fine-grained.
110 - 140	30	LIMESTONE WITH SHELL - Limestone, 65%, pale orange to olive gray, soft to moderately hard, abundant quartz in matrix; Shell, 20%, very pale orange to yellowish gray, medium-sized fragments, angular; Sand, 10%, colorless to frosted, quartz, sub-rounded; Sand, 5%, black, phosphatic, very fine-grained, rounded.
140 - 150	10	SANDSTONE WITH SHELL - Sandstone, 75%, pale orange to yellowish gray, fine- to medium-grained, poorly cemented, quartz grains in calcareous matrix; Shell, 15%, very pale orange to grayish orange, medium-sized fragments; Sand, 10%, frosted to colorless, quartz, sub-rounded; Sand, trace, black, phosphatic, very fine-grained, sub-rounded.
150 - 170	20	CLAYEY SAND - Sand, 70%, colorless, quartz, medium- to fine-grained, sub-rounded; Clay, 20%, grayish olive, very soft; Sand, 10%, black, phosphatic, fine-grained; Shell, trace, small fragments.

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<u>Depth Interval (feet)</u>	<u>Thickness (feet)</u>	<u>Sample Description</u>
170 - 180	10	CLAYEY SAND WITH SANDSTONE - Sand, 65%, colorless, quartz, medium- to fine-grained, sub-angular; Clay, 25%, grayish olive, very soft; Sandstone, 10%, dark gray, quartz, fine-grained, moderately well cemented, slightly calcareous matrix; Shell, trace, large fragments.
180 - 190	10	CLAYEY SAND - Sand, 40%, colorless, quartz, fine- to medium-grained, sub-angular; Sand, 30%, black, phosphatic, fine-grained, sub-angular, Clay, 30%, olive gray, very soft, clumpy.
190 - 240	50	SANDY CLAY - Clay, 70%, grayish olive green to dark gray, soft; Sand, 15%, colorless to smoky brown, quartz, very fine-grained, sub-rounded; Sand, 15%, black, phosphatic, very fine-grained, sub-rounded; Chert, trace, black to grayish black, hard, angular, some large pieces.
240 - 255	15	CLAY - Clay, 100%, dark greenish gray to olive gray, soft, plastic; Sand, trace, black, phosphate, very fine-grained, sub-angular; Sand, trace, colorless, quartz, very fine-grained.
255 - 260	5	CLAY AND LIMESTONE - Clay, 60%, olive gray, soft, plastic; Limestone, 30%, yellowish gray to very light gray, biomicrite, moderately hard; Chert, 10%, brownish black, angular fragments.
260 - 270	10	LIMESTONE AND CLAY - Limestone, 60%, yellowish gray, biomicritic, friable, moderately well cemented, chalky, fossiliferous; Clay, 30%, greenish gray, soft; Marl, 10%, very light gray, soft, somewhat dry, friable; Sand, trace, black, phosphatic, very fine-grained.
270 - 316	46	LIMESTONE WITH CLAY - Limestone, 80%, very pale orange to yellowish gray, biomicritic, granular, friable, fairly well cemented, somewhat fossiliferous; Clay, 20%, light to dark olive gray, soft; Marl, trace, very light gray, soft; Chert, trace, dark yellowish brown, very hard.
316 - 460	144	LIMESTONE - Limestone, 100%, very pale orange to light gray, micrite and sparite, moderately well cemented, occasionally friable, Glauconitic,



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<u>Depth Interval (feet)</u>	<u>Thickness (feet)</u>	<u>Sample Description</u>
		oolitic, cherty; Shell fragments, trace; Coal, trace.
460 - 560	100	LIMESTONE - Limestone, 65%, very pale orange, biomicrite, friable, moderately hard to moderately soft, granular, friable, whole fossils, foraminifera; Limestone, 35%, light gray to white, crypto- to microcrystalline, micritic, moderately hard.
550 - 570	20	LIMESTONE - 100%, very pale orange, biomicritic, friable, moderately soft, granular.
570 - 580	10	LIMESTONE - Limestone, 90%, very pale orange, biomicritic, moderately soft, granular; Dolomite, 10%, pale yellowish brown to dark yellowish brown, microcrystalline, hard.
580 - 590	10	LIMESTONE AND DOLOMITE - Limestone, 60%, very pale orange, biomicritic, moderately soft, chalky, granular; Dolomite, 40%, pale yellowish brown, microcrystalline, hard, pin hole solution vugs.
590 - 610	20	DOLOMITE AND LIMESTONE - Dolomite, 60%, pale yellowish brown to dark yellowish brown, microcrystalline, hard, occasional pin hole vugs; Limestone, 40%, pale yellowish brown to very pale orange, biomicritic, moderately hard, granular, friable; Limestone, 10%, light olive gray, microcrystalline, moderately hard, occasional small solution cavities.
590 - 650	60	LIMESTONE AND DOLOMITE - Limestone, 50%, very pale orange, biomicritic, moderately soft to moderately hard; Limestone, 20%, white to very light gray, biomicritic, moderately hard, foraminifera; Dolomite, 30%, pale yellowish brown, micro- to cryptocrystalline, hard.
650 - 690	40	DOLOMITE WITH LIMESTONE - Dolomite, 90%, moderate yellowish brown, microcrystalline, hard, occasional pin hole vugs; Limestone, 10%, very pale orange, biomicritic, moderately soft to hard; Limestone, trace, very light gray, biomicritic, moderately hard.

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<u>Depth Interval (feet)</u>	<u>Thickness (feet)</u>	<u>Sample Description</u>
690 - 720	30	DOLOMITE AND LIMESTONE - Dolomite, 65%, very pale orange to yellowish brown, microcrystalline to cryptocrystalline, hard, solution vugs; Dolomite, 20%, yellowish gray to medium light gray, cryptocrystalline, hard, microscopic solution holes and cracks; Limestone, 15%, very pale orange to white, micritic, moderately hard, chalky.
730 - 790	60	DOLOMITE - Dolomite, 75%, pale yellowish orange to yellowish gray to dark yellowish orange, micro- to cryptocrystalline, hard, shell impressions, solution vugs; Dolomite, 15%, yellowish gray to medium light gray, micro- to cryptocrystalline, very small solution holes, moderately hard to very hard; Limestone, trace, very pale orange to white, micritic, marly, moderately well cemented; Dolomite, 10%, brownish black, micro- to cryptocrystalline, very hard; Shell fragments, trace; Clay, trace, grayish red.
790 - 816	26	DOLOMITE - Dolomite, 50%, pale yellowish brown, microcrystalline, moderately hard, pin hole solution vugs; Dolomite, 25%, very pale orange, micro- to cryptocrystalline, moderately hard, pin hole vugs; Dolomite, 25%, light olive gray to medium gray, cryptocrystalline, hard; Limestone, trace, very pale orange to white, micritic; Shell fragments, trace; Foraminifera, trace.
816 - 825	9	DOLOMITE - Dolomite, 60%, moderate to dusky yellowish brown, microcrystalline, hard, small solution vugs with infilling; Dolomite, 40%, pale yellowish brown, cryptocrystalline, pin hole solution vugs; Limestone, trace, white to light gray, micritic, moderately hard.
825 - 840	15	DOLOMITE AND LIMESTONE - Dolomite, 65%, moderate yellowish brown to yellowish gray, cryptocrystalline, moderately hard to hard; Limestone, 35%, white to very light gray, microcrystalline, biomicritic, moderately hard, fossils, chalky.
840 - 860	20	LIMESTONE AND DOLOMITE - Limestone, 65%, very light gray to yellowish gray, microcrystalline to cryptocrystalline, biomicritic, sparitic at times,

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<u>Depth Interval (feet)</u>	<u>Thickness (feet)</u>	<u>Sample Description</u>
		hard, solution vugs with crystalline infilling; Dolomite, 35%, pale yellowish brown to light olive gray, crypto- to microcrystalline, hard, pin hole solution vugs.
860 - 870	10	DOLOMITE WITH LIMESTONE - Dolomite, 75%, pale yellowish brown to light olive gray, microcrystalline to cryptocrystalline, moderately hard to hard, solution cavities, pitted; Limestone, 25%, light gray to white, biosparite, moderately hard, vuggy; Chert, trace, light olive gray.
870 - 890	20	DOLOMITE WITH LIMESTONE - Dolomite, 80%, pale yellowish brown to very pale orange, microsucrosic, hard, occasionally mottled, calcareous in part, vuggy; Limestone, 20%, very pale orange, micritic, hard, dolomitic in part, occasionally sparitic, oolitic, vuggy; Fossils, trace; Glauconite, trace.
890 - 900	10	LIMESTONE AND DOLOMITE - Limestone, 50%, very pale orange, sparitic, dolomitic in part, vuggy; Foraminifera, 20%, very pale orange; Dolomite, 30%, pale brown, microsucrosic, hard, occasionally mottled, calcareous in part, vuggy; Oolites, trace.
900 - 920	20	DOLOMITE WITH LIMESTONE - Dolomite, 80%, moderate yellowish brown to black to grayish orange, sucrosic, hard, occasionally mottled, calcareous in part, vuggy; Limestone, 20%, very pale orange to light gray, sparitic, hard, occasionally glauconitic, dolomitic in part, vuggy; Shell, trace; Foraminifera, trace.
920 - 940	20	LIMESTONE WITH DOLOMITE - Limestone, 80%, pale yellowish brown to light olive gray, biosparite, moderately hard, mottled, abundant foraminifera in matrix, vuggy; Dolomite, 20%, very pale orange, cryptocrystalline, hard, vuggy, numerous shell molds and cavities; Shell, trace, small fragments.
940 - 950	10	DOLOMITE WITH LIMESTONE - Dolomite, 85%, pale to dark yellowish brown, micro- to cryptocrystalline, moderately hard to hard, occasionally mottled,

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<u>Depth Interval (feet)</u>	<u>Thickness (feet)</u>
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Sample Description

		vuggy; Limestone, 15%, very light gray to very pale orange, biosparite, moderately hard to moderately soft.
962 - 980	8	LIMESTONE AND DOLOMITE - Limestone, 70%, very pale orange to white, biosparite, occasionally micritic, moderately hard to hard, abundant foraminifera and shell fragments in matrix, oolitic, glauconitic, vuggy; Dolomite, 30%, pale yellowish brown, microcrystalline, hard, numerous solution vugs, fossiliferous; Foraminifera, trace.
980 - 990	10	DOLOMITE WITH LIMESTONE - Dolomite, 90%, very pale orange to light gray, sucrosic, hard, occasionally mottled, calcareous in part; Limestone, 10%, white to very pale orange, sparite, occasional biosparite fragments, moderately hard, occasionally oolitic, occasionally glauconitic, vuggy.
990 -1010	20	LIMESTONE WITH DOLOMITE - Limestone, 80%, white to very pale orange, sparite, occasionally biospartic, moderately hard, glauconitic, vuggy; Dolomite, 20%, very pale orange to light gray, sucrosic, hard, calcareous in part, vuggy.
1010-1020	10	LIMESTONE - Limestone, 60%, very pale orange to white, biosparite, micritic at times, moderately soft, vuggy; Limestone, 40%, grayish orange to very pale orange, biosparite, moderately hard, foraminifera; Shell, trace, small angular fragments.
1020-1070	50	LIMESTONE WITH DOLOMITE - Limestone, 85%, grayish orange to very pale orange, biosparite, moderately hard, vuggy, foraminifera; Dolomite, 15%, medium gray to light gray to grayish brown, cryptocrystalline, mottled, pin hole solution vugs, sucrosic, hard; Shell, trace, small fragments.
1070-1090	20	LIMESTONE - 100%, very pale orange to light brown, sparite, occasionally micritic and biosparitic, hard, oolitic, glauconitic, vuggy; Shell, trace, fragments; Dolomite, trace; Foraminifera, trace.

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<u>Depth Interval (feet)</u>	<u>Thickness (feet)</u>	<u>Sample Description</u>
1090-1110	20	DOLOMITE AND LIMESTONE - Dolomite, 60%, dark yellowish brown to grayish orange, cryto- to micro crystalline, sucrosic to microsucrosic, hard, calcareous in part, occasionally mottled, vuggy; Limestone, 40%, very pale orange, sparite, hard, occasionally oolitic, glauconitic, vuggy; Shell, trace, fragments; Foraminifera, trace.
1110-1120	10	LIMESTONE - Limestone, 100%, very pale orange, sparite, moderately hard to soft, occasionally oolitic, glauconitic, vuggy, abundant foraminifera.
1110-1190	80	DOLOMITE AND LIMESTONE - Dolomite, 65%, light gray to grayish orange to dark yellowish brown, micro- to cryptocrystalline, calcareous in part, hard, occasionally mottled, hard, vuggy, fossiliferous; Limestone, 35%, very pale orange to white, biosparite, dolomitic in part, moderately hard to soft, occasionally oolitic, occasionally glauconitic, pin hole vugs, foraminifera; Shell, trace, fragments.
1190-1235	45	NO SAMPLES COLLECTED - cavity zone.
1235-1265	30	DOLOMITE - 95%, Dolomite, moderate yellowish brown, cryptocrystalline, microsucrosic, moderately soft, small to pinhole solution vugs; Limestone, 5%, white to very light gray, biomicritic, micro- to cryptocrystalline, solution vugs; Dolomite, trace, medium gray, cryptocrystalline, hard, banded, abundant solution holes.
1265-1295	30	DOLOMITE - Dolomite, 60%, very pale orange to moderate brown, microsucrosic, fairly well cemented, soft; Dolomite, 40%, pale yellowish brown, microsucrosic, moderately soft to moderately hard; Limestone, trace, white, biomicritic, micro- to cryptocrystalline, pin hole solution vugs; Dolomite, trace, black.
1295-1305	10	LIMESTONE AND CALCAREOUS DOLOMITE - Limestone, 60%, moderate yellowish brown, saccharoidal, brittle, vugs, subhedral dolomite crystals; Calcareous Dolomite, 30%, dark yellowish orange, saccharoidal, moderately well cemented, occasional

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<u>Depth Interval (feet)</u>	<u>Thickness (feet)</u>	<u>Sample Description</u>
		vugs; Limestone, 10%, grayish brown, cryptocrystalline, dense; Limestone, trace, white, cryptocrystalline.
1305-1335	30	DOLOMITIC LIMESTONE WITH DOLOMITE - Dolomitic Limestone, 80%, grayish orange to very pale orange, microcrystalline, cellular, saccharoidal, brittle, fossil shell fragment intraclasts; Dolomite, 10%, pale yellowish brown to dark yellowish brown, saccharoidal, microstylolites; Limestone, 10%, white to yellowish gray, cryptocrystalline.
1335-1350	15	DOLOMITE AND LIMESTONE - Dolomite, 60%, pale yellowish brown to dark yellowish brown, micro- to cryptocrystalline, well cemented, brittle subhedral calcite, vugs; Dolomitic Limestone, 20%, grayish orange, cellular; Limestone, 20%, very pale orange, cryptocrystalline; Shell, trace.
1350-1385	35	LIMESTONE WITH DOLOMITE - Limestone, 50%, pale yellowish brown, cellular, saccharoidal, subhedral calcite; Limestone, 40%, white, cryptocrystalline, moderately well cemented, chalky, shell fragment intraclasts, subhedral calcite, abundant foraminifera; Dolomite, 10%, pale yellowish brown, saccharoidal, dense, subhedral calcite; Shell, trace.
1385-1400	15	DOLOMITE WITH LIMESTONE - Dolomite, 40%, dark yellowish brown, microcrystalline, hard, dense, occasional vugs; Limestone, 45%, moderate yellowish brown, cellular, saccharoidal, subhedral calcite; Limestone, 15%, white, cryptocrystalline, chalky, foraminifera intraclasts.
1400-1424	24	LIMESTONE WITH DOLOMITE - Limestone, 90%, very pale orange, cryptocrystalline, chalky, abundant foraminifera, shell fragments; Dolomite, 10%, moderate yellowish brown, cellular, saccharoidal.
1424-1445	21	LIMESTONE - Limestone, 50%, moderate yellowish brown to dark yellowish brown, cellular, saccharoidal, shell fragment intraclasts, subhedral calcite; Limestone, 50%, very pale

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<u>Depth Interval (feet)</u>	<u>Thickness (feet)</u>	<u>Sample Description</u>
		orange, chalky, abundant shell fragment, foraminifera.
1445-1459	14	Conventional core, no returns, no recovery, possible cavity.
1459-1510	51	LIMESTONE WITH DOLOMITE - Limestone, 60%, very pale orange, cryptocrystalline, bioturbated, chalky, shell and foraminifera; Limestone, 15%, moderate yellowish brown, saccharoidal, hard brittle, occasional vugs; Dolomite, 25%, dark yellowish brown, saccharoidal, hard, dense, subhedral dolomite.
1502-1515	13	LIMESTONE WITH CALCAREOUS DOLOMITE - Limestone, 55%, dark yellowish brown to moderate yellowish brown, moderately well cemented, saccharoidal, hard, brittle, subhedral calcite; Calcareous Dolomite, 35%, to moderate yellowish brown, cellular, euhedral dolomitic crystals, hard, brittle; Limestone, 10%, very pale orange, chalky, occasional euhedral calcite.
1515-1530	15	CALCAREOUS DOLOMITE AND LIMESTONE - Calcareous Dolomite, 60%, moderate yellowish brown to grayish orange, finely saccharoidal, hard, dense, brittle; Limestone, 30%, moderate yellowish brown, saccharoidal, cellular in part, brittle; Limestone, 10%, very pale orange, chalky; Phosphatic nodules, trace; Shell, trace, fragments.
1530-1558	28	DOLOMITE AND DOLOMITIC LIMESTONE - Dolomite, 55%, dark yellowish brown, microcrystalline, moderately well to poorly cemented, dense; Dolomitic Limestone, 35%, moderate yellowish brown, cellular, saccharoidal, brittle, poorly cemented; Limestone, 10%, very pale orange, sparitic in part, chalky, shell fragment intraclasts; Limestone, trace, light gray, cryptocrystalline; Phosphatic nodules, trace.
1558-1588	30	LIMESTONE WITH DOLOMITIC LIMESTONE - Limestone, 50%, dark yellowish brown to moderate yellowish brown, saccharoidal, brittle, poorly cemented; Limestone, 35%, very pale orange, cryptocrystalline, chalky, shell fragments,

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<u>Depth Interval (feet)</u>	<u>Thickness (feet)</u>	<u>Sample Description</u>
		intraclasts; Dolomitic Limestone, 15%, dark yellowish brown, cryptocrystalline, cellular, saccharoidal, brittle; Foraminifera, trace.
1588-1599	11	DOLOMITE WITH LIMESTONE - Dolomite, 50%, dark yellowish brown, finely saccharoidal, brittle, poorly cemented; Calcareous Dolomite, 30%, moderate yellowish brown, cellular, saccharoidal, brittle, poorly cemented; Limestone, 20%, very pale orange, cryptocrystalline, chalky, slightly sparitic, subhedral calcite.
1599-1610	11	LIMESTONE WITH DOLOMITE - Limestone, 60%, moderate yellowish brown, cellular, saccharoidal, shell fragments, moderately well cemented, brittle; Dolomite, 30%, dark and dusky yellowish brown, finely saccharoidal, hard, brittle, moderately well cemented; Limestone, 10%, very pale orange, cryptocrystalline, chalky, soft, slightly sparitic, foraminifera.
1610-1630	20	DOLOMITE WITH LIMESTONE - Dolomite, 40%, moderate yellowish brown, microcrystalline, brittle, moderately well cemented; Dolomite, 40%, cellular, saccharoidal, brittle, poorly cemented; Limestone, 20%, very pale orange, cryptocrystalline, bioturbated.
1630-1640	10	LIMESTONE WITH DOLOMITE - Limestone, 70%, grayish orange, saccharoidal, moderately well cemented, shell fragment intraclasts; Limestone, 10%, very pale orange, cryptocrystalline, subhedral calcite, soft, shelly, foraminifera; Dolomite, 20%, moderate to dark yellowish brown, microcrystalline, hard, dense, slightly cellular; Dolomite, trace, dusky brown.
1640-1658	10	DOLOMITE WITH LIMESTONE - Dolomite, 80%, grayish orange to moderate yellowish brown, cellular saccharoidal, hard, brittle, moderately well cemented, shell fragment intraclasts; Limestone, 20%, very pale orange, saccharoidal, hard, dense, well cemented, shell intraclasts.
1658-1698	30	DOLOMITE - Dolomite, 100%, dark to moderate yellowish brown and grayish orange,



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<u>Depth Interval (feet)</u>	<u>Thickness (feet)</u>	<u>Sample Description</u>
		microcrystalline, hard, dense, occasional vugs; Chert, trace.
1698-1758	60	DOLOMITE WITH PHOSPHORITE - Dolomite, 60%, moderate yellowish brown, finely saccharoidal, well cemented, hard, brittle, vugs; Dolomite, 30%, multi-colored, finely saccharoidal, well cemented, hard, brittle, vugs; Phosphorite, 10%, very pale orange, dusky yellowish brown, abundant foraminifera residue with chert nuclei; Chert, trace, pinkish gray, well cemented, conchoidal, fracture, foraminifera residue.
1758-1770	12	PHOSPHORITE WITH DOLOMITE - Phosphorite, 70%, white, chalky, vacuolar, very soft, foraminifera residue; Dolomite, 20%, moderate yellowish brown, cellular, saccharoidal, well cemented; Dolomite, 10%, dusky yellowish brown, microcrystalline, hard, dense; Chert, trace, light gray to dusky brown, nodules.
1770-1800	30	DOLOMITE WITH PHOSPHORITE - Dolomite, 45%, dusky yellowish brown, microcrystalline, hard, well cemented, dense, calcite filled vugs; Dolomite, 40%, moderate yellowish brown, moderately to well cemented, Phosphorite, 15%, white, chalky, very soft, foraminifera residue, Chert, trace, light gray to dusky brown.
1800-1810	10	DOLOMITE WITH PHOSPHORITE AND CHERT - Dolomite, 40%, moderate yellowish brown, cellular, saccharoidal, well cemented, hard, brittle; Dolomite, 30%, dusky yellowish brown, microcrystalline, hard, dense, occasional trace euhedral calcite filled vugs; Phosphorite, 20%, white, chalky, vacuolar, soft, abundant foraminifera residue, abundant chert nodules and nuclei; Chert, 10%, white, medium gray, conchoidal fracture, abundant foraminifera residue.
1810-1886	76	DOLOMITE WITH PHOSPHORITE AND CHERT - Dolomite, 60%, moderate yellowish brown to dark yellowish brown, microcrystalline, hard, dense; Dolomite, 30%, moderate yellowish brown, finely cellular, saccharoidal, hard, well cemented, calcareous in part; Phosphorite, 10%, white, chalky, vacuolar, foraminifera, chert nuclei; Chert, trace, pale

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<u>Depth Interval (feet)</u>	<u>Thickness (feet)</u>	<u>Sample Description</u>
		light olive gray to yellowish brown, conchoidal fracture; Limestone, trace, moderate yellowish brown, dolomitic, cellular, saccharoidal.
1886-1904	18	DOLOMITE, CHERT AND PHOSPHORITE - Dolomite, 60%, dark yellowish brown to moderate yellowish brown, microcrystalline, moderately well to well cemented, hard, dense; Chert, 25%, white to light olive gray, conchoidal fracture, foraminifera; Phosphorite, 15%, white, chalky, vacuolar, soft, abundant foraminifera residue.
1904-1928	24	DOLOMITE WITH SILICEOUS DOLOMITIC LIMESTONE - Dolomite, 70%, dark yellowish brown to moderate brown, crystalline; Dolomite, 20%, greenish blue-gray to greenish olive gray, friable to moderately hard, sucrosic, glauconitic; Siliceous Dolomitic Limestone, 10%, bluish white to very pale orange, friable to very hard, silty, occasional chert nodules.
1928-1934	6	DOLOMITE WITH LIMESTONE - Dolomite, 50%, dark yellowish brown, crystalline; Dolomite, 40%, greenish blue-gray, friable to moderately hard, sucrosic, glauconitic; Siliceous Dolomitic Limestone, 10%, very pale orange, biomicritic, friable to very soft.
1934-1956	22	LIMESTONE WITH DOLOMITE - Limestone 90%, yellowish gray to pale white, biomicrite, soft, friable, chalky, phosphatic; Dolomite, 10%, moderate yellowish brown to dark brown, microcrystalline, moderately well cemented to very hard.
1956-1958	2	DOLOMITE WITH LIMESTONE; Dolomite, 50%, light brown, coarse crystalline; Dolomite, 45%, medium to dark brown, very hard; Limestone, 5%, yellowish gray to pale white, biomicrite, soft, friable, chalky, phosphatic.
1958-1960	2	LIMESTONE AND DOLOMITE; Limestone, 90%, yellowish gray to pale white, biomicrite, soft, friable, chalky, phosphatic; Dolomite, 5%, light brown, coarse crystalline; Dolomite 5%, medium to dark brown, very hard.

## GERAGHTY &amp; MILLER, INC.

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<u>Depth Interval (feet)</u>	<u>Thickness (feet)</u>	<u>Sample Description</u>
1960-1964	4	DOLOMITE AND LIMESTONE - Dolomite, 60%, moderate yellowish brown, sucrosic, hard; Limestone, 40%, very pale orange; Chert, trace.
1964-1973	9	LIMESTONE - Limestone, 100%, very pale orange, micritic in part, soft; Dolomite, trace.
1973-1988	15	LIMESTONE WITH DOLOMITE - Limestone, 85%, very pale orange, micritic, moderately well cemented; Dolomite, 15%, moderate yellowish brown to dusky yellowish brown, hard.
1988-2008.5	20.5	LIMESTONE - Limestone, 100%, very pale orange, both micritic and sparitic, sucrosic, foraminifera replacement; Quartz, trace.
2008.5-2012	3.5	NO SAMPLES - possible cavity zone.
2012-2015	3	DOLOMITE - Dolomite, 75%, dark yellowish brown, crystalline, hard; Dolomite, 25%, light brown, sucrosic, soft.
2015-2033	18	DOLOMITE WITH LIMESTONE - Dolomite, 45%, dark yellowish brown, crystalline, hard; Dolomite, 40%, light brown, sucrosic, soft; Limestone, 15%, very pale orange, micritic, moderately well cemented.
2033-2042	9	DOLOMITE - Dolomite, 75%, dark yellowish brown, crystalline, hard; Dolomite, 15%, dusky yellowish brown, crystalline; Dolomite, 10%, light brown, sucrosic; Chert, trace.
2042-2051	9	DOLOMITE - Dolomite, 70%, black, crystalline, very hard, occasionally vuggy; Dolomite, 25%, moderate to dusky brown, sucrosic, hard, moderately vuggy; Dolomite, 5%, moderate yellowish brown, crystalline, very hard.
2051-2058	7	DOLOMITE - Dolomite, 85%, pale to dusky yellowish brown, crystalline, sucrosic, moderately hard to hard, vuggy; Dolomite, 15%, dark brown, finely crystalline, very hard.
2058-2085	27	DOLOMITE - Dolomite, 100%, yellow gray to light olive gray to yellowish brown, finely crystalline,

## GERAGHTY &amp; MILLER, INC.

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<u>Depth Interval (feet)</u>	<u>Thickness (feet)</u>	<u>Sample Description</u>
		hard; Dolomite, trace, pale to moderate yellow brown, sucrosic, moderately hard.
2085-2103	18	DOLOMITE - Dolomite, 60%, pale yellowish brown to moderate brown, finely crystalline, hard; Dolomite, 40%, dark gray to grayish black, finely crystalline, hard, occasional vugs.
2103-2167	64	DOLOMITE - Dolomite, 100%, pale yellowish brown to dark yellowish brown, predominately finely crystalline, occasionally coarsely crystalline, occasionally sucrosic; Chert, trace.
2167-2170	3	LIMESTONE AND DOLOMITE - Limestone, 60%, light to medium light gray, finely crystalline, occasional pin holes, vuggy; Dolomite, 40%, dark yellowish brown, crystalline, hard.
2170-2264	7	DOLOMITE - Dolomite, 85%, pale yellowish brown to dark yellowish brown, finely crystalline, occasionally sucrosic, moderately hard to hard, pin holes apparent, vuggy; Dolomite, 15%, dusky brown, crystalline, moderately hard to friable; Dolomite, trace, dark gray, finely crystalline, hard.
2264-2300	36	DOLOMITE - Dolomite, 75%, pale yellowish brown to grayish yellow brown, crystalline, occasional pin holes, vuggy, brittle; Dolomite, 15%, moderate brown, sucrosic, brittle; Dolomite, 10%, dark gray to black, finely crystalline, conchoidal fractures, very brittle.
2300-2410	110	DOLOMITE - Dolomite, 70%, dark gray to black, crystalline; Dolomite 20%, dusky brown, finely crystalline, hard, brittle.
2410-2444	34	DOLOMITE WITH CHERT - Dolomite, 70%, pale yellowish brown to dark yellowish brown, crystalline, hard; Chert, 30%, light gray to medium gray; Limestone, trace, hard.

TOTAL DEPTH: 2444 FEET

GEOLOGIC LOG  
OF  
SHALLOW MONITOR WELL  
CITY OF MELBOURNE  
MELBOURNE, FLORIDA

<u>Depth Interval (feet)</u>	<u>Thickness (feet)</u>	<u>Sample Description</u>
0 - 30	30	NO SAMPLES COLLECTED.
33 - 55	22	SAND WITH SHELL - Sand, 55%, medium light gray, fine- to medium-grained, sub-rounded; Sand, 30%, grayish orange to dark yellowish orange, fine- to very fine-grained, sub-rounded; Shell, 15%, white to medium dark gray to grayish orange, medium- to large-sized fragments and whole shells (gastropods and bivalves); Sand, trace, black, phosphatic, very fine-grained, sub-rounded.
55 - 75	20	SHELL WITH SAND - Shell, 90%, very pale orange to medium gray, medium- to large-sized fragments, Sand, 10%, colorless to smoky gray, quartz, fine- to medium-grained, sub-rounded.
75 - 85	10	SHELL WITH SAND AND SANDY LIMESTONE - Shell, 80%, very pale orange to dark gray, medium- to large-sized fragments; Sand, 10%, colorless, quartz medium- to fine-grained, sub-rounded; Limestone, 10%, light olive gray, biosparite, moderately hard, sandy.
85 - 95	10	SHELL AND SANDY LIMESTONE - Shell, 60%, pale orange and gray, medium- to large-sized fragments; Limestone, 30%, light olive gray, moderately well-cemented; Sand, 10%, colorless to black, quartz and phosphate.
95 - 135	40	LIMESTONE AND SHELL - Limestone, 65%, pale olive gray to olive gray, moderately to well cemented, biosparite, abundant quartz in matrix; Shell, 35%, very pale orange to medium dark gray, very large- to medium-sized fragments; Clay, trace.
135 - 155	20	LIMESTONE WITH SHELL AND SANDY CLAY - Limestone, 55%, pale olive to light olive gray, moderately well-cemented, abundant quartz and black phosphatic grains in matrix; Shell, 20%, very pale orange to gray, medium- to large-sized fragments; Clay, 15%, grayish olive green, soft; Sand, 5%, Sand, colorless, quartz, fine-grained; Phosphate, 5%, black, very fine-grained.

Shallow Monitor Well

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<u>Depth Interval (feet)</u>	<u>Thickness (feet)</u>	<u>Sample Description</u>
155 - 195	40	SANDY CLAY WITH SHELL - Clay, 80%, light olive gray to olive gray to dusky yellow green, soft; Sand, colorless quartz, fine- to medium-grained, sub-rounded; Sand, 5%, black, phosphatic, fine-grained, sub-rounded; Shell, 10%, very pale orange to pinkish gray, small-to medium-sized fragments.
195 - 235	40	SANDY CLAY - Clay, 90%, olive gray, firm; Sand, 5%, colorless, quartz, fine-grained, sub-rounded; Sand, 5%, black, phosphatic, sub-rounded.
235 - 255	20	SANDY CLAY WITH SAND - Clay, 80%, greenish gray, soft, sandy; Sand, 10%, colorless, quartz, very fine-grained, sub-rounded; Sand, 10%, black, phosphatic, fine-grained, sub-rounded; Shell, trace, very pale orange, small to medium-sized fragments.
255 - 265	10	LIMESTONE AND CLAY WITH SHELL - Limestone, 60%, yellowish gray to pinkish gray, biomicritic, friable, moderately well-cemented, fossiliferous; Clay, 30%, light olive gray, soft; Shell, 10%, very pale orange, small- to medium-sized fragments.
265 - 275	10	LIMESTONE - Limestone, 90%, very pale orange, biomicritic, friable; Shell, 5%, very pale orange to pinkish gray, small- to medium-sized fragments; Clay, 5%, light olive gray, soft; Phosphate, trace, moderate brown to black, fine-grained.
275 - 285	10	LIMESTONE WITH SHELL - Limestone, 70%, very pale orange, biomicritic, fairly well- to moderately well cemented, fossils; Shell, 20%, pale orange to medium dark gray, medium-sized fragments; Sand, 10%, colorless, quartz, medium- to fine-grained, sub-rounded.
285 - 318	33	LIMESTONE WITH CLAY - Limestone, 70%, very pale orange, biomicritic, moderately well cemented; Clay, 30%, light to dark olive gray, soft; Shell, trace fragments; Sand, trace, phosphatic, fine-grained.

Shallow Monitor Well

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<u>Depth Interval (feet)</u>	<u>Thickness (feet)</u>	<u>Sample Description</u>
318 - 350	32	LIMESTONE - Limestone, 90%, very pale orange to white, biosparite, moderately soft to soft, granular, foraminifera; Clay, 5%, olive gray; Sand, 5%, black, phosphatic, very fine-grained; Shell trace, fragments.
350 - 400	50	LIMESTONE - Limestone, 100%, very pale orange to very light gray, biosparite, soft; Shell fragments, trace, small- to medium-sized; Phosphate, trace, black to grayish brown, fine-grained.
400 - 470	70	LIMESTONE - Limestone, 95%, very pale orange to very light gray, sparse biomicrite, soft; Shell, 5%, very pale orange to light pinkish gray, small- to medium-sized fragments.
470 - 520	50	LIMESTONE - Limestone, 55%, very pale orange, sparse biomicrite and biosparite, soft; Limestone, 45%, very light gray to light gray, biomicrite, moderately well-cemented; Shell, trace; Shell casts, trace, very light gray to light brownish gray, fragmented.
520 - 575	55	LIMESTONE - Limestone, 60%, very light gray to light gray, biomicritic, moderately- to well-cemented, occasionally vuggy; Limestone, 40%, very pale orange, biomicritic, soft to moderately hard; Dolomite, trace, light brown, well cemented; shell, trace, light gray to light brown; Fossil casts, trace.
575 - 605	30	DOLOMITE WITH LIMESTONE - Dolomite, 90%, pale yellowish brown to moderate yellowish brown, microcrystalline, hard, occasional pin hole vugs; Limestone, 10%, pale yellowish orange to very light gray, packed biomicrite, poorly to moderately well cemented; Fossil casts, trace, pale yellowish brown.
605 - 615	10	LIMESTONE WITH DOLOMITE - Limestone, 70%, pale yellowish orange to very light gray, packed biomicrite, very soft; Dolomite, 30%, pale yellowish brown to moderate yellowish brown, microcrystalline, hard, occasionally vuggy.

Shallow Monitor Well

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<u>Depth Interval (feet)</u>	<u>Thickness (feet)</u>	<u>Sample Description</u>
615 - 675	60	DOLOMITE AND LIMESTONE - Dolomite, 50%, light brownish gray, microcrystalline, moderately hard to hard, occasional vugs; Limestone, 50%, very pale orange to very light gray, packed biomicrite, soft; Fossil casts, trace, light brownish gray; Marly limestone, trace, white, soft; Chert, trace, light gray, hard.
675 - 685	10	DOLOMITE WITH LIMESTONE - Dolomite, 70%, pale yellow brown to yellowish orange, microcrystalline, hard; Limestone, 30%, very pale orange, biomicrite, moderately well cemented; Chert, trace, light gray, hard.
685 - 695	10	LIMESTONE AND DOLOMITE - Limestone, 65%, very pale orange, poorly washed biosparite, well cemented; Dolomite, 35%, pale yellow brown, microcrystalline, hard; Chert, trace, light gray, hard.
695 - 715	20	DOLOMITE WITH LIMESTONE - Dolomite, 90%, grayish orange to light brownish gray, microcrystalline, hard; Limestone, 10%, very pale orange, biosparite, well cemented.
715 - 795	80	DOLOMITE - Dolomite, 100%, grayish orange to dark yellowish brown, microcrystalline, hard, vuggy; Limestone, trace, very pale orange, biosparite, well cemented; Dolomite, trace, brownish black to grayish black, micro- to cryptocrystalline, very hard.
795 - 805	10	DOLOMITE - Dolomite, 80%, pale yellowish orange to pale yellowish brown, micro- to cryptocrystalline, hard, occasional pin hole vugs; Dolomite, 20%, medium light gray, micro- to cryptocrystalline, moderately hard.
805 - 815	10	LIMESTONE AND DOLOMITE - Limestone, 70%, light to medium gray, biomicrite, well cemented; Dolomite, 20%, pale yellowish orange, micro- to cryptocrystalline, hard, occasional pin hole vugs; Dolomite, 10%, medium light gray, microcrystalline, moderately hard.
815 - 835	20	LIMESTONE AND DOLOMITE - Limestone, 70%, medium gray, biomicrite, well cemented; Limestone, 25%,



Shallow Monitor Well

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<u>Depth Interval (feet)</u>	<u>Thickness (feet)</u>	<u>Sample Description</u>
		very pale orange to pinkish gray, sparse biomicrite, very well cemented; Dolomite, 5%, pale yellowish orange, micro- to cryptocrystalline, hard, occasional pin hole vugs; Foraminifera, trace, pale yellowish orange.
835 - 855	20	LIMESTONE WITH DOLOMITE - Limestone, 75%, light to medium gray, biomicrite, well cemented; Dolomite, 25%, pale yellowish orange to pale yellowish brown, hard, micro- to cryptocrystalline, occasional pin hole vugs; Shell casts, trace, pale yellowish orange.
855 - 875	20	DOLOMITE AND LIMESTONE - Dolomite, 50%, pale yellowish orange to dark yellowish orange, microcrystalline, hard, occasional vugs; Limestone, 50%, light gray, sparse biomicrite, well cemented.
875 - 925	50	DOLOMITE WITH LIMESTONE - Dolomite, 65%, grayish orange to pale yellowish brown, microsucrosic, hard; Limestone, 20%, medium light gray, micrite, poorly- to well-cemented, fossiliferous; Limestone, 10%, very pale orange, sparse biomicrite, soft; Dolomite, 5%, grayish black, micro- to cryptocrystalline, very hard.
925 - 940	15	DOLOMITIC LIMESTONE - Dolomitic limestone, 75%, grayish orange to very pale orange, sorted biosparite, soft; Limestone, 15%, white, biomicrite, soft; Dolomite, 10%, moderate yellowish brown, microcrystalline, hard.
940 - 968	28	DOLOMITE WITH LIMESTONE - Dolomite, 90%, grayish orange to moderate yellowish brown, microcrystalline, hard, vuggy; Limestone, 10%, very light gray, biomicrite, soft.
968 - 988	20	LIMESTONE - Limestone, 100%, very pale orange to grayish orange to medium light gray, biosparite, and biomicrite, soft, grainy, occasional pin hole vugs.
988 - 994	6	LIMESTONE AND DOLOMITE - Limestone, 60%, white to very light gray, biomicrite, poorly cemented, pin hole vugs; Dolomite, 40%, pale yellowish to moderate yellowish brown, microsucrosic,

Shallow Monitor Well

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<u>Depth Interval (feet)</u>	<u>Thickness (feet)</u>	<u>Sample Description</u>
		moderately well cemented, occasional pin hole vugs.
994 - 1004	10	DOLOMITE WITH LIMESTONE - Dolomite, 90%, pale yellowish brown to moderate yellowish brown, microcrystalline, well cemented, occasional vugs; Limestone, 10%, very pale orange, poorly cemented, occasional pin hole vugs.
1004-1012	8	LIMESTONE WITH DOLOMITE - Limestone, 95%, very pale orange to very light gray, poorly cemented; Dolomite, 5%, pale yellowish brown, microsucrosic, moderately well cemented.
1012-1025	13	DOLOMITE WITH LIMESTONE - Dolomite, 85%, pale yellowish brown to dusky yellowish brown to grayish orange, micro- to cryptocrystalline, microsucrosic, moderately to very well cemented; Limestone, 15%, very pale orange, poorly cemented.
1025-1090	65	LIMESTONE - Limestone, 100%, very pale orange to yellowish gray, biomicritic, moderately to well cemented.
1090-1100	10	DOLOMITE WITH LIMESTONE - Dolomite, 90%, dark yellowish brown, microsucrosic, moderately to well cemented, vuggy; Limestone, 10%, very light gray to pinkish gray, poorly cemented.
1100-1108	8	LIMESTONE AND DOLOMITE - Limestone, 60%, pinkish gray to very light gray, poorly cemented; Dolomite, 40%, dark yellowish brown to brownish gray, microsucrosic, moderately to well cemented, vuggy.
1108-1123	15	LIMESTONE - Limestone, 100%, very pale orange to grayish orange, biosparite, moderately soft, fossiliferous, foraminifera.
1123-1126	3	DOLOMITE AND LIMESTONE - Dolomite, 60%, olive gray to pale yellowish brown, microcrystalline, hard; Limestone, 40%, very pale orange, biosparite, soft.
1126-1141	15	DOLOMITE WITH LIMESTONE - Dolomite, 90%, moderate yellowish brown to light brown, microcrystalline,

Shallow Monitor Well

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<u>Depth Interval (feet)</u>	<u>Thickness (feet)</u>	<u>Sample Description</u>
		hard, sucrosic, occasional pin hole vugs; Limestone, 10%, very pale orange, moderately soft.
1141-1145	4	DOLOMITE - Dolomite, 100%, grayish orange to dark yellowish brown, microcrystalline, hard, occasional vugs.
1145-1173	28	DOLOMITE WITH LIMESTONE - Dolomite, 90%, grayish orange to pale yellowish brown, microcrystalline to cryptocrystalline, hard; Limestone, 10%, very pale orange, soft, occasional foraminifera.
1173-1200	27	DOLOMITE WITH LIMESTONE - Dolomite, 75%, moderate yellowish brown, micro- to cryptocrystalline, hard, vuggy; Limestone, 25%, very pale orange, biomicrite, moderately hard.
1200-1208	8	DOLOMITE - Dolomite, 100%, moderate brown to dark yellowish brown, microcrystalline, hard, pin hole vugs.

TOTAL DEPTH: 1208 FEET

GEOLOGIC LOG  
OF  
LOWER FLORIDAN AQUIFER  
MONITOR WELL  
CITY OF MELBOURNE  
MELBOURNE, FLORIDA

<u>Depth Interval (feet)</u>	<u>Thickness (feet)</u>	<u>Sample Description</u>
0 - 4.5	4.5	SANDY SOIL - Sandy Soil, 60%, very light gray, fine-grained, sub-rounded, well sorted; Sandy Soil, 30%, pale brown, fine-grained, sub-rounded; Sandy Soil, 10%, dark yellowish orange, fine-grained, sub-rounded, well sorted.
4.5 - 50	45.5	NO SAMPLE
50 - 55	5	SHELL WITH SAND - Shell, 85%, very pale orange to pale yellowish brown, fragments; Sand, 15%, colorless, quartz, medium- to coarse-grained, sub-angular; Phosphate, trace.
55 - 80	25	NO SAMPLE.
80 - 117	37	SHELLY SAND - Sand, 60%, colorless, quartz, fine- to medium-grained, sub-rounded; Shell, 40%, very pale orange to pale yellowish brown; Phosphate, trace.
117 - 145	28	SHELLY SAND WITH SANDSTONE - Sand, 60%, colorless, quartz, fine- to medium-grained; Shell, 30%, very pale orange to pale yellowish brown; Sandstone, 10%, light olive gray, mostly fine-grained, moderately well cemented; Phosphate, trace.
145 - 160	15	SANDY SHELL WITH CLAY - Shell, 50%, very pale orange to pale yellowish brown, fragments; Sand, 40%, colorless, quartz, sub-angular to sub-rounded, medium- to coarse-grained; Clay, 10%, light olive gray, pliable.
160 - 170	10	SANDY SHELL WITH SANDSTONE AND CLAY - Shell, 40%, very pale orange to pale yellowish brown, fragments; Sand, 30%, colorless, quartz, medium- to coarse-grained, sub-rounded; Sandstone, 20%, light olive gray, moderately well cemented; Clay, 10%, light olive gray, pliable.
170 - 195	25	SANDY CLAY - Clay, 80%, olive green, pliable; Sand, 20%, colorless, quartz, fine-grained; Shell, trace.

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<u>Depth Interval (feet)</u>	<u>Thickness (feet)</u>	<u>Sample Description</u>
195 - 205	10	SANDY CLAY - Clay, 85%, olive gray, pliable; Sand, 15%, colorless, quartz, fine- to medium-grained; Shell, trace.
205 - 233	28	SHELLY SAND WITH CLAY - Sand, 50%, colorless, quartz, medium- to coarse-grained, sub-rounded; Shell, 40%, very pale orange, fragments; Clay, 10%, olive gray, pliable.
233 - 279	46	CLAY - Clay, 90%, dark greenish gray, pliable; Sand, 5%, colorless, quartz; Shell, 5%, very pale orange, fragments.
279 - 310	31	SHELLY SAND WITH LIMESTONE - Sand, 50% colorless, quartz, fine- to medium-grained, sub-angular to sub-rounded; Shell, 30%, very pale orange to pale yellowish brown, fragments; Limestone, 20%, yellowish gray, biosparite, moderately well cemented; Clay, trace.
310 - 320	10	SAND AND SHELL - Sand, 65%, colorless, quartz, fine-grained, sub-rounded; Shell, 35%, very pale orange, small fragments.
320 - 342	22	LIMESTONE WITH SHELL AND SAND - Limestone, 80%, very pale orange to light gray, biomicrite, poorly cemented; Shell, 10%, very pale orange, small fragments; Sand, 10%, colorless, quartz, fine-grained; Foraminifera, trace.
342 - 570	228	LIMESTONE - Limestone, 100%, very pale orange to very light gray, poorly cemented.
570 - 590	20	LIMESTONE - Limestone, 90%, very pale orange to very light gray, poorly cemented; Sand, 10%, colorless, quartz, medium-grained; Phosphate, trace.
590 - 600	10	DOLOMITE WITH LIMESTONE - Dolomite, 85%, very pale orange to light brown, crystalline, hard; Limestone, 15%, very light gray, soft.
600 - 650	50	SANDY CLAY WITH LIMESTONE - Clay, 50%, medium gray to medium light gray; Sand, 15%, colorless, quartz, fine- to medium grained, sub-rounded; Limestone, 35%, very pale orange to light brown,

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<u>Depth Interval (feet)</u>	<u>Thickness (feet)</u>	<u>Sample Description</u>
		biomicrite and calcite, poorly cemented, somewhat siliceous.
650 - 660	10	LIMESTONE - Limestone, 100%, very pale orange to light brown, biosparite and micrite, some calcite, poorly cemented; Clay, trace, sandy; Dolomite, trace.
660 - 790	130	DOLOMITE - Dolomite, 95%, grayish orange and pale yellowish brown, crystalline, micrite, moderately well cemented, some biomicrite replacement features visible; Limestone, 5%, white to very pale orange, micrite, soft; Foraminifera, trace.
790 - 830	40	DOLOMITE - Dolomite, 60%, white to very pale orange, finely crystalline, chalky, slightly drusy, foraminifera; Dolomite, 40%, moderate yellowish brown, coarsely crystalline, hard and brittle; Sandstone, trace, medium light gray, fine-grained, angular, poorly cemented, mafic minerals present.
830 - 840	10	DOLOMITE - Dolomite, 70%, very pale orange, microcrystalline, hard, dense; Dolomite, 20%, white, finely crystalline, calcareous, chalky, soft, drusy; Sandstone, trace, medium light gray, fine-grained, angular, poorly cemented, mafic minerals.
840 - 880	40	DOLOMITE - Dolomite, 100%, very pale orange to moderate yellowish orange, finely crystalline, chalky, firm and soft, sometimes brittle, abundant shell fragments and foraminifera, calcareous.
880 - 890	10	DOLOMITE - Dolomite, 90%, moderate yellowish brown, finely crystalline, saccharoidal, drusy; Dolomite, 10%, very pale orange, firm and brittle, chalky, abundant foraminifera.
890 - 920	30	DOLOMITE - Dolomite, 100%, very pale orange, finely crystalline, soft, chalky, calcareous.
920 - 930	10	DOLOMITE - Dolomite, 95%, moderate yellowish brown, crystalline, slightly sucrosic, occasional pin holes, vuggy; Limestone, 5%, white, chalky.

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<u>Depth Interval (feet)</u>	<u>Thickness (feet)</u>	<u>Sample Description</u>
		brown, crystalline, slightly sucrosic, occasional pin holes, vuggy; Limestone, 5%, white, chalky.
930 - 960	30	DOLOMITE WITH LIMESTONE - Dolomite, 70%, moderate yellowish brown, crystalline, moderately hard, slightly sucrosic, occasional pin holes, vuggy; Limestone, 30%, white, chalky.
960 - 962	2	DOLOMITE - Dolomite, 60%, moderate brown, finely crystalline, hard, pin holes, vugs; Dolomite, 30%, pale to moderate yellowish brown, sucrosic, moderately hard; Limestone, 10%, white, chalky.
962-1050	88	NO RETURNS.
1050-1080	30	DOLOMITE - Dolomite, 100%, very pale orange, soft finely crystalline, chalky, bioturbated.
1080-1090	10	LIMESTONE WITH DOLOMITE - Limestone, 70%, medium gray and medium light gray, finely crystalline, soft, poorly consolidated, fragmented; Dolomite, 30%, very pale orange, finely crystalline, soft and brittle, chalky, bioturbated.
1090-1105	15	DOLOMITE - Dolomite, 100%, very pale orange, finely crystalline, chalky, fossiliferous, bioturbated.
1105-1150	45	DOLOMITE - Dolomite, 60%, dark yellowish brown, finely crystalline, hard; Dolomite, 30%, very pale orange, chalky; Dolomite, 10%, yellowish brown, finely crystalline, drusy, brittle.
1150-1190	40	DOLOMITE - Dolomite, 100%, moderate yellowish brown, microcrystalline to finely crystalline, hard, dense, fossiliferous.
1190-1230	40	DOLOMITE - Dolomite, 60%, pale to moderate yellowish brown, sucrosic, vuggy; Dolomite, 25%, moderate brown, crystalline; Limestone, 15%, white, micrite, dolomitic.
1230-1240	10	DOLOMITE WITH LIMESTONE - Dolomite, 90%, very pale orange, to pale yellowish brown, finely crystalline, sucrosic, vuggy; Limestone, 10%, very pale orange, sparite, poorly cemented; Phosphate, trace.

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<u>Depth Interval (feet)</u>	<u>Thickness (feet)</u>	<u>Sample Description</u>
1240-1279	39	DOLOMITE - Dolomite, 95%, dusky to moderate yellowish brown, finely crystalline, sucrosic, vuggy; Dolomite, 5%, pale yellowish brown, finely crystalline; Phosphate, trace, black.
1279-1287	8	DOLOMITE - Dolomite, 60%, dusky yellowish brown, finely crystalline, sucrosic, vuggy; Dolomite, 40%, very pale yellowish brown.
1287-1290	3	DOLOMITIC LIMESTONE - Limestone, 100%, pale yellowish orange, micrite, occasionally vuggy, dolomitic.
1290-1295	5	DOLOMITE - Dolomite, 60%, pale yellowish orange, micritic; Dolomite, 40%, dusky yellowish brown, finely crystalline, sucrosic.
1295-1300	5	LIMESTONE WITH DOLOMITE - Limestone, 70%, very pale orange, sparite, moderately well cemented; Dolomite, 30%, moderate yellowish brown, finely crystalline, sucrosic, vuggy; Foraminifera, trace.
1300-1305	5	DOLOMITE - Dolomite, 100%, very pale orange to dark yellowish brown, finely crystalline, vuggy.
1305-1320	15	DOLOMITE AND LIMESTONE - Dolomite, 50%, moderate yellowish brown, crystalline, moderately hard, vuggy; Limestone, 50%, very pale orange, biosparite, soft, shell fragments; Foraminifera, trace.
1320-1330	10	LIMESTONE - Limestone, 100%, very pale orange, poorly cemented, soft; Foraminifera, trace; Dolomite, trace.
1330-1340	10	DOLOMITE - Dolomite, 100%, grayish orange, crystalline, hard; Limestone, trace, very pale orange.
1340-1350	10	LIMESTONE - Limestone, 100%, very pale orange, biosparite, soft; Foraminifera, trace.
1350-1360	10	DOLOMITE AND LIMESTONE - Dolomite, 60%, moderate yellowish brown, crystalline, moderately hard; Limestone, 40%, very pale orange, micrite, soft; Foraminifera, trace.



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<u>Depth Interval (feet)</u>	<u>Thickness (feet)</u>	<u>Sample Description</u>
1360-1395	35	LIMESTONE AND DOLOMITE - Limestone, 85%, very pale orange, sparite, soft; Dolomite, 15%, moderate yellowish brown, moderately hard, replacement features; Foraminifera, trace.
1395-1402	7	DOLOMITE WITH LIMESTONE - Dolomite, 90%, moderate yellowish brown, crystalline, moderately well cemented, sucrosic in part; Limestone, 10%, very pale orange, micrite, soft.
1402-1420	18	DOLOMITE AND LIMESTONE - Dolomite, 60%, moderate yellowish brown, crystalline, moderately well to well-cemented; Limestone, 40%, very pale orange, biosparite, soft, foraminifera.
1420-1430	10	LIMESTONE WITH DOLOMITE - Limestone, 90%, very pale orange, biosparite and micrite, soft; Dolomite, 10%, dark to moderate yellowish brown, crystalline, hard.
1430-1440	10	LIMESTONE AND DOLOMITE - Limestone, 60%, very pale orange, biosparite and micrite, soft; Dolomite, 40%, moderate yellowish brown, crystalline, hard.
1440-1450	10	DOLOMITE - Dolomite, 100%, moderate yellowish brown, crystalline, hard.
1450-1469	19	DOLOMITE - Dolomite, 60%, dark yellowish brown, sucrosic, hard; Dolomite, 40%, dusky brown, finely crystalline, very hard; Limestone, trace, very pale orange, sparite, finely crystalline, moderately hard.
1469-1844	375	Drilled with direct circulation, NO RETURNS.

TOTAL DEPTH: 1844 FEET

GEOLOGIC LOG  
OF  
DEEP MONITOR WELL  
CITY OF MELBOURNE  
MELBOURNE, FLORIDA

<u>Depth Interval (feet)</u>	<u>Thickness (feet)</u>	<u>Sample Description</u>
0 - 30	30	SHELL AND SAND - Shell, 50%, very pale orange to dark gray, small to large fragments; Sand, 50%, quartz, fine- to medium-grained, sub-rounded; Sand, trace; Phosphate, trace.
30 - 70	40	SHELL WITH SAND - Shell, 80%, very pale orange to medium dark gray, small to large fragments; Sand, 20%, gray to colorless, quartz, medium-grained, sub-rounded; Limestone, trace, olive gray to light olive gray, poorly cemented, moderately hard, quartz and phosphate grains in matrix.
70 - 110	40	SANDY SHELL WITH LIMESTONE - Shell, 70%, very pale orange, medium-sized fragments; Sand, 10%, colorless to black, quartz and phosphate, medium-grained, angular; Limestone, 20%, light olive gray, biosparite, sand grains in matrix, moderately hard.
110 - 130	20	LIMESTONE AND SANDY SHELL - Limestone, 65%, olive gray, biosparite, soft to moderately hard, abundant quartz grains in matrix; Shell, 25%, very pale orange to dark yellowish orange, medium-sized fragments; Sand, 10%, colorless to black, quartz and phosphate, fine- to medium-grained, sub-rounded.
130 - 150	20	SANDSTONE AND SANDY SHELL - Sandstone, 50%, light olive gray to light grayish olive, quartz and phosphate, fine- to medium-grained, moderately hard, sub-rounded, calcareous matrix; Shell, 40%, very pale orange to black, medium-sized fragments; Sand, 10%, colorless to black, quartz and phosphate, fine- to medium-grained, sub-rounded; Clay, trace, olive green.
150 - 160	10	LIMESTONE AND SANDY SHELL - Limestone, 50%, light olive gray, fine- to medium-grained, moderately hard, abundant quartz and phosphate grains in matrix; Shell, 40%, very pale orange to black, medium-sized fragments; Sand, 10%, colorless and black, fine- to medium-grained, sub-rounded.

## Deep Monitor Well

-2-

<u>Depth Interval (feet)</u>	<u>Thickness (feet)</u>	<u>Sample Description</u>
160 - 180	20	CLAYEY SAND - Sand, 60%, colorless to frosted and black, quartz and phosphate, fine- to medium-grained, rounded to sub-rounded; Clay, 30%, grayish olive, soft, clumpy; Shell, 10%, pale orange to dark yellowish orange, small fragments.
180 - 230	50	SANDY CLAY - Clay, 70%, olive gray, soft; Sand, 20%, black, medium-grained, sub-rounded; Sand, 10%, colorless, quartz, fine- to medium-grained, sub-angular; Shell, trace, very pale orange to dark yellowish orange, small- to large-sized fragments.
230 - 260	30	SANDY CLAY WITH SHELL - Clay, 65%, grayish olive green, soft plastic; Sand, 15%, black to moderate brown, phosphate, very fine-grained, sub-angular; Sand, 10%, clear to smoky quartz, fine-grained, sub-rounded; Shell, 10%, very pale orange to pale yellowish orange, medium-sized fragments.
260 - 310	50	LIMESTONE WITH SHELLY CLAY - Limestone, 75%, very pale orange, biomicrite, friable, many fossil casts and fragments; Clay, 15%, grayish olive green, soft; Shell, 10%, very pale orange to pale yellowish orange, medium- to large-sized fragments; Sand, trace, black to moderate brown, phosphate, very fine-grained, sub-rounded to rounded.
310 - 553	243	LIMESTONE WITH MARL - Limestone, 60%, very pale orange to pinkish gray, biomicrite to sparse biomicrite, friable, many fossil casts, poorly to moderately well-cemented; Limestone, 15%, moderate orange pink, sparite, well cemented; Marl, 15%, very light gray, very soft; Limestone, 10%, yellowish gray to light gray, sparite, well cemented; Shell, trace, very light gray to light gray, fragments.
553 - 570	17	LIMESTONE - Limestone, 100%, very pale orange, biomicritic, soft, friable.
570 - 650	80	LIMESTONE AND DOLOMITE - Limestone, 60%, pale yellowish orange to very pale orange, micrite, friable; Dolomite, 35%, moderate yellowish brown to dark yellowish brown, micro- to crypt-

Deep Monitor Well

-3-

<u>Depth Interval (feet)</u>	<u>Thickness (feet)</u>	<u>Sample Description</u>
		crystalline, hard, small solution vugs; Dolomite, 5%, dusky brown, cryptocrystalline, very hard.
650 - 765	115	DOLOMITE - Dolomite, 80%, grayish orange to moderate yellowish brown, microsucrosic, small solution holes, hard; Dolomite, 20%, pinkish gray to yellowish gray, microsucrosic, hard, vuggy; Limestone, trace, very pale orange, micrite, friable.
765 - 788	23	DOLOMITE - 100%, moderate yellowish brown to pale yellowish brown, cryptocrystalline, moderately microsucrosic, hard, solution cavities, contains occasional fossil molds.
788 - 810	22	DOLOMITE AND LIMESTONE - Dolomite, 50%, moderate yellowish brown to pale yellowish brown, cryptocrystalline, poorly to well cemented; Limestone, 50%, very light gray to very pale orange, micrite and biomicrite, moderately well- to poorly-cemented, occasional vugs.
810 - 882	72	DOLOMITE WITH LIMESTONE - Dolomite, 70%, pale brown to dusky brown, cryptocrystalline to microcrystalline, poorly to moderately well cemented, vuggy, microsucrosic; Limestone, 30%, very pale orange, micrite, moderately well-cemented, vuggy.
882 - 886	4	DOLOMITE - Dolomite, 95%, moderate yellowish brown, microcrystalline, moderately hard; Limestone, 5%, very pale orange, micrite, soft.
886 - 896	10	LIMESTONE WITH DOLOMITE - Limestone, 85%, very pale orange, sparite, occasional solution cavities; Dolomite, 15%, medium dark gray with black flecks, cryptocrystalline, moderately soft.
896 - 942	46	LIMESTONE - Limestone, 100%, very pale orange to grayish orange, biosparite, moderately hard, occasional solution cavities, foraminifera present.
942 - 1018	76	LIMESTONE AND DOLOMITE - Limestone, 50%, white, micrite, poorly to moderately well cemented; Dolomite, 50%, pale yellowish brown to dark yellowish brown, microsucrosic, hard, vugs.

## GERAGHTY &amp; MILLER, INC.

Deep Monitor Well

-4-

<u>Depth Interval (feet)</u>	<u>Thickness (feet)</u>	<u>Sample Description</u>
1018-1028	10	DOLOMITE WITH LIMESTONE - Dolomite, 80%, grayish orange to olive gray, cryptocrystalline, vuggy; Limestone, 20%, bluish white to very pale orange, micrite, poorly cemented.
1028-1098	70	LIMESTONE WITH DOLOMITE - Limestone, 90%, very pale orange, micrite, well cemented, vuggy; Dolomite, 10%, pale yellowish brown to olive gray, microcrystalline to cryptocrystalline, moderately hard.
1098-1107	9	DOLOMITE WITH LIMESTONE - Dolomite, 95%, pale yellowish brown to dark yellowish brown to olive gray, cryptocrystalline, moderately to very hard, vuggy; Limestone, 5%, very pale orange, micrite, well cemented.
1107-1124	17	LIMESTONE WITH DOLOMITE - Limestone, 90%, very pale orange, micrite, moderately well cemented; Dolomite, 10%, moderate yellowish brown to olive gray, cryptocrystalline.
1124-1216	92	DOLOMITE WITH LIMESTONE - Dolomite, 75%, pale yellowish brown, to olive gray, cryptocrystalline, hard, solution cavities; Limestone, 25%, very pale orange to white, biosparite, soft, pin-hole vugs.
1216-1226	10	NO RETURNS - possible cavity.
1226-1246	20	DOLOMITE AND LIMESTONE - Dolomite, 90%, light brown to olive gray, cryptocrystalline, hard, vuggy; Limestone, 10%, white, biomicrite, poorly cemented, vuggy, foraminifera.
1246-1341	95	DOLOMITE - Dolomite, 40%, pale yellowish brown to moderate brown, cryptocrystalline, hard; Dolomite, 30%, moderate yellowish brown, hard, sucrosic, vuggy; Dolomite, 10%, light gray to medium gray, cryptocrystalline, hard, mottled; Chert, 10%, grayish orange to brownish black, cryptocrystalline, hard, mottled; Limestone, 10%, white to light bluish gray, biomicrite, moderately soft.
1341-1350	9	LIMESTONE - Limestone, 100%, very pale orange,

## GERAGHTY &amp; MILLER, INC.

Deep Monitor Well

-5-

<u>Depth Interval (feet)</u>	<u>Thickness (feet)</u>	<u>Sample Description</u>
		biomicrite, moderately soft, abundant foraminifera.
1350-1370	20	DOLOMITE WITH LIMESTONE - Dolomite, 80%, dark yellowish brown, cryptocrystalline, hard; Dolomite, 10%, moderate yellowish brown, micro- to finely-crystalline, hard, sucrosic, vuggy; Limestone, 10%, very pale orange, biomicrite, soft.
1370-1380	10	LIMESTONE WITH DOLOMITE - Limestone, 80%, very pale orange, biosparite, moderately soft, foraminifera; Dolomite, 20%, moderate yellowish brown, finely crystalline, hard, sucrosic, vuggy; Limestone, trace, olive gray, micrite.
1380-1388	8	DOLOMITE - Dolomite, 100%, moderate brown, microcrystalline, hard, microsucrosic, vuggy; Limestone, trace, very pale orange.
1388-1392	4	LIMESTONE - Limestone, 100%, very pale orange, biosparite, soft; Shell, trace; Foraminifera, trace.
1392-1402	10	DOLOMITE - Dolomite, 100%, moderate yellowish brown to moderate brown, finely crystalline, hard, sucrosic to microsucrosic, vuggy; Limestone, trace, very pale orange, soft.
1402-1415	13	LIMESTONE - Limestone, 100%, very pale orange, biosparite, friable; Dolomite, trace.
1415-1420	5	DOLOMITE - Dolomite, 50%, grayish orange, finely crystalline, moderately hard, sucrosic, vuggy; Dolomite, 50%, dark yellowish brown to moderate brown, hard, microsucrosic, mottled, solution vugs; Limestone, trace.
1420-1450	30	DOLOMITE WITH LIMESTONE - Dolomite, 70%, dark yellowish brown to moderate yellowish brown, finely crystalline, hard, microsucrosic, small solution vugs; Limestone, 30%, very pale orange to olive gray, biomicrite, soft to moderately soft; Limestone, trace, olive gray, biomicrite.
1450-1470	20	LIMESTONE WITH DOLOMITE - Limestone, 70%, very pale orange, biosparite, soft; Dolomite, 20%,

## GERAGHTY &amp; MILLER, INC.

Deep Monitor Well

-6-

<u>Depth Interval (feet)</u>	<u>Thickness (feet)</u>	<u>Sample Description</u>
		moderate yellowish brown, finely crystalline, hard, microsugrosic to sugrosic, solution vugs; Limestone, 10%, olive gray, biomicrite, moderately soft.
1470-1480	10	DOLOMITE - Dolomite, 100%, dark yellowish brown to grayish brown, finely crystalline, hard, microsugrosic, solution vugs, mottled; Limestone, trace, very pale orange, soft.
1480-1490	10	DOLOMITE WITH LIMESTONE - Dolomite, 80%, dark yellowish brown to grayish brown, hard, microsugrosic, vuggy, mottled; Limestone, 20%, very pale orange, biomicrite, soft.
1490-1502	12	LIMESTONE WITH DOLOMITE - Limestone, 95%, very pale orange, biomicrite, soft; Dolomite, 5%, dark yellowish brown to grayish brown, finely crystalline, hard, microsugrosic, vuggy.
1502-1518	16	DOLOMITE - Dolomite, 100%, moderate yellowish orange to dusky brown, finely crystalline, hard, microsugrosic, solution vugs, mottled.

TOTAL DEPTH: 1518 FEET

**APPENDIX B**



APPENDIX B

Core Data

- B1 Core Log Analyses
- B2 Core Descriptions



**Professional Service Industries, Inc.**  
Florida Testing Division

RECEIVED

JUL 24 1987

July 17, 1987

Geraghty & Miller, Inc.

Geraghty & Miller Inc.  
P.O. Box 30489  
Palm Beach Gardens, FL 33410-0489

Attn: James Wheatley

RE: Permeability Test  
PSI File No.: 381-70095-8

Gentlemen:

Submitted herein are the results of laboratory tests performed on a core sample delivered to our office on July 14, 1987. Please find the permeability data on the summary of results under cover of this letter.

The permeability test was performed in general accordance with the falling head method used by the U.S. Corps of Engineers. No confining pressures were used except for the water head pressure of approximately four (4) feet.

If you should have any questions, please do not hesitate to call us.

Respectfully submitted,

PSI/FLORIDA TESTING DIVISION

James M. Savidge  
Vice President

JMS:il

Summary of Results

Core Depth

Flow Direction

Permeability (cm/sec)

1712' - 1716'

Vertical

$1.87 \times 10^{-6}$



**Professional Service Industries, Inc.**  
Florida Testing Division

July 10, 1987

Geraghty & Miller Inc.  
P.O. Box 30489  
Palm Beach Gardens, FL 33410-0489

Attn: James Wheatley

Re: Permeability Test  
PSI No.: 381-70095-5

Gentlemen:

Submitted herein are the results of laboratory tests performed on a core sample delivered to our office by Mr. Wheatley on July 7, 1987. Please find the permeability data on the Summary of Results under cover of this letter.

The permeability test was performed in general accordance with the falling head method used by the U.S. Corps of Engineers. No confining pressures were used except for the water head pressure of approximately four (4) feet.

If you should have any questions, please do not hesitate to call us.

Respectfully submitted,

PSI/FLORIDA TESTING DIVISION

A handwritten signature in cursive script that reads 'Curtis M. Karr'. The signature is written in dark ink and is positioned above the printed name and title.

Curtis M. Karr  
Branch Manager

SUMMARY OF RESULTS

<u>Core Depth</u>	<u>Flow Direction</u>	<u>Permeability (cm/sec)</u>
1,945' - 1,947' (Upper Section)	Vertical	$4.7 \times 10^{-5}$



**Professional Service Industries, Inc.**  
Florida Testing Division

July 10, 1987

Geraghty & Miller Inc.  
P.O. Box 30489  
Palm Beach Gardens, FL 33410-0489

Attn: James Wheatley

Re: Permeability Test  
PSI No.: 381-70095-4

Gentlemen:

Submitted herein are the results of laboratory tests performed on a core sample delivered to our office by Mr. Wheatley on July 7, 1987. Please find the permeability data on the Summary of Results under cover of this letter.

The permeability test was performed in general accordance with the falling head method used by the U.S. Corps of Engineers. No confining pressures were used except for the water head pressure of approximately four (4) feet.

If you should have any questions, please do not hesitate to call us.

Respectfully submitted,

PSI/FLORIDA TESTING DIVISION

A handwritten signature in cursive script that reads 'Curtis M. Karr'.

Curtis M. Karr  
Branch Manager

SUMMARY OF RESULTS

<u>Core Depth</u>	<u>Flow Direction</u>	<u>Permeability (cm/sec)</u>
1,945' - 1,947' (Middle Section)	Vertical	4.6 X 10 <sup>-5</sup>



**Professional Service Industries, Inc.**  
Florida Testing Division

July 10, 1987

Geraghty & Miller Inc.  
P.O. Box 30489  
Palm Beach Gardens, FL 33410-0489

Attn: James Wheatley

Re: Permeability Test  
PSI No.: 381-70095-3

Gentlemen:

Submitted herein are the results of laboratory tests performed on a core sample delivered to our office by Mr. Wheatley on July 7, 1987. Please find the permeability data on the Summary of Results under cover of this letter.

The permeability test was performed in general accordance with the falling head method used by the U.S. Corps of Engineers. No confining pressures were used except for the water head pressure of approximately four (4) feet.

If you should have any questions, please do not hesitate to call us.

Respectfully submitted,

PSI/FLORIDA TESTING DIVISION

A handwritten signature in cursive script that reads 'Curtis M. Karr'. The signature is written in dark ink and is positioned above the printed name and title.

Curtis M. Karr  
Branch Manager



SUMMARY OF RESULTS

<u>Core Depth</u>	<u>Flow Direction</u>	<u>Permeability (cm/sec)</u>
1,945' - 1,947' (Bottom Section)	Vertical	$5.0 \times 10^{-5}$



**Professional Service Industries, Inc.**  
Florida Testing Division

July 10, 1987

Geraghty & Miller Inc.  
P.O. Box 30489  
Palm Beach Gardens, FL 33410-0489

Attn: James Wheatley

Re: Permeability Test  
PSI No.: 381-70095-2

Gentlemen:

Submitted herein are the results of laboratory tests performed on a core sample delivered to our office by Mr. Wheatley on July 7, 1987. Please find the permeability data on the Summary of Results under cover of this letter.

The permeability test was performed in general accordance with the falling head method used by the U.S. Corps of Engineers. No confining pressures were used except for the water head pressure of approximately four (4) feet.

If you should have any questions, please do not hesitate to call us.

Respectfully submitted,

PSI/FLORIDA TESTING DIVISION

A handwritten signature in black ink that reads 'Curtis M. Karr'. The signature is written in a cursive style with a prominent 'C' and 'K'.

Curtis M. Karr  
Branch Manager

SUMMARY OF RESULTS

Core Depth

Flow Direction

Permeability (cm/sec)

1,963' - 1,992'

Not Determined

$1.3 \times 10^{-7}$



**Professional Service Industries, Inc.**  
Florida Testing Division

July 10, 1987

Geraghty & Miller Inc.  
P.O. Box 30489  
Palm Beach Gardens, FL 33410-0489

Attn: James Wheatley

Re: Permeability Test  
PSI No.: 381-70095-6

Gentlemen:

Submitted herein are the results of laboratory tests performed on a core sample delivered to our office by Mr. Wheatley on July 7, 1987. Please find the permeability data on the Summary of Results under cover of this letter.

The permeability test was performed in general accordance with the falling head method used by the U.S. Corps of Engineers. No confining pressures were used except for the water head pressure of approximately four (4) feet.

If you should have any questions, please do not hesitate to call us.

Respectfully submitted,

PSI/FLORIDA TESTING DIVISION

A handwritten signature in cursive script that reads 'Curtis M. Karr'.

Curtis M. Karr  
Branch Manager

SUMMARY OF RESULTS

Core Depth

Flow Direction

Permeability (cm/sec)

1,994' - 2,007'

Vertical

$7.9 \times 10^{-7}$



**Professional Service Industries, Inc.**  
Florida Testing Division

July 10, 1987

Geraghty & Miller Inc.  
P.O. Box 30489  
Palm Beach Gardens, FL 33410-0489

Attn: James Wheatley

Re: Permeability Test  
PSI No.: 381-70095-7

Gentlemen:

Submitted herein are the results of laboratory tests performed on a core sample delivered to our office by Mr. Wheatley on July 7, 1987. Please find the permeability data on the Summary of Results under cover of this letter.

The permeability test was performed in general accordance with the falling head method used by the U.S. Corps of Engineers. No confining pressures were used except for the water head pressure of approximately four (4) feet.

If you should have any questions, please do not hesitate to call us.

Respectfully submitted,

PSI/FLORIDA TESTING DIVISION

A handwritten signature in cursive script that reads 'Curtis M. Karr'.

Curtis M. Karr  
Branch Manager

SUMMARY OF RESULTS

Core Depth

Flow Direction

Permeability (cm/sec)

1,994' - 2,007'

Vertical

$5.0 \times 10^{-5}$

# CORE LOG

PROJECT: SMITH & GILLESPIE DATE: 4/9/87

WELL: IW-1 LOCATION: City of Melbourne

OBSERVER: M. Pijnenburg CORE NO. 3 DIAMETER: 4"

START CORING: 4/9/87 @ 0345 hrs. FINISH CORING: 4/9/87 @ 0650 hrs.

TYPE OF BIT USED: Diamond button bit CORED INTERVAL: 1772.5' - 1776.5' pl

TOP OF CORE: 1772.5' BOTTOM OF CORE: 1774.76' % RECOVERY 56

DEPTH	GEOLOGIC DESCRIPTION	REMARKS
1772.5'	LIMESTONE - limestone, 95%, very pale orange, sparitic	PR: = 20 min/ft,
to	and micritic, shell replacement features visible,	WOB = 3 - 4000 lbs.
1772.83'	moderately to well cemented, hard, dense; chert, 5%,	
	interbedded needles and nodules, dense; foraminifera,	
	trace.	
1772.83'	DOLOMITE - dolomite, 100%, moderate yellowish brown,	PR: = 20 min/ft,
to 1772.92'	sucrosic, friable, vuggy; limestone lenses, trace.	WOB = 3 - 4000 lbs.
1772.92'	DOLOMITE - dolomite, 95%, moderate to dark yellowish brown,	PR: = 20 min/ft
to	microcrystalline, very well cemented, dense; chert and	WOB = 3 - 4000 lbs.
1773.34'	limestone nodules, 5%, (<1" diameter).	
1773.34'	CHERT WITH LIMESTONE - chert, 80%, olive gray, very hard;	PR: = 20 min/ft
to	limestone, 20%, very pale orange, micrite, poorly to	WOB = 3 - 4000 lbs.
1773.51'	moderately well cemented.	
1773.51'	DOLOMITE - dolomite, 90%, dark yellowish brown, micro-	PR: = 20 min/ft
to	crystalline, hard, dense, very well cemented; limestone,	WOB = 3 - 4000 lbs.
1774.01'	5%, very pale orange, interbedded (lenses < 1" thick),	







GERAGHTY & MILLER, INC.

1963-1992 Core number 6, very poor recovery, no description available

1994-2007 Core number 7, very poor recovery, no description available

# **APPENDIX C**

APPENDIX C

Gyroscopic Survey Results

C1 12 1/4-inch diameter pilot hole 0-1600 feet (August  
27, 1986)



**REPORT**  
**of**  
**SUB-SURFACE**  
**DIRECTIONAL**  
**SURVEY**

ALSAY INC.

COMPANY

CITY OF MELBOURNE INJ. #1

WELL NAME

BREVARD COUNTY, FL

LOCATION

JOB NUMBER

TYPE OF SURVEY

DATE

GYROSCOPIC MULTISHOT

8/27/86

SURVEY BY

LAFAYETTE, LOUISIANA

OFFICE



P. O. Box 51106, O.C.S./Lafayette, Louisiana 70505/(318)235-8501

RECEIVED

AUG 29 1986

August 27, 1986

GERAGHTY & MILLER, INC.

Alsay Inc.  
P.O. Box 6650  
Lake Worth, FL 33461

Attn: Mr. Bob Newford

Re: City of Melbourne Inj. #1  
Brevard County, FL

Dear Sir:

Enclosed please find the original and four (4) copies of the Gyroscopic Multishot survey report on the above mentioned well.

We would like to take this opportunity to thank you for calling us for our services, and trust that we may continue to serve you in the future.

Yours truly,

Mike Becnel  
District Surveyor Coordinator

MB/cpg

Enclosures



**BEST AVAILABLE COPY**

ESAY, INC.  
CITY OF MELBOURNE INJ.#1  
BREVARD CO. FL.

DECLINATION :

0.00 E

DATE PRINTED : 27-AUG-86

PL. P. NO. 3

CUR REF. NO. : 801385.7AZ

JOB NUMBER :

MEASURED DEPTH	DRIFT		COURSE LENGTH	TRUE VERTICAL DEPTH	RECTANGULAR COORDINATES		CLOSURE		DOUBLE SEVERITY
	ANGLE D M	DIRECTION D M			DISTANCE	DIRECTION D M			
900.00	0 19	N 3 42 E	30.00	899.98	5.08 N	0.04 E	5.08 N	0 25 E	0.13
930.00	0 21	N 2 36 E	30.00	929.98	5.25 N	0.05 E	5.25 N	0 30 E	0.11
960.00	0 21	N 14 30 W	30.00	959.98	5.43 N	0.03 E	5.43 N	0 17 E	0.35
990.00	0 21	N 7 54 W	30.00	989.98	5.61 N	0.01 W	5.61 N	0 5 W	0.13
1020.00	0 22	N 13 12 W	30.00	1019.98	5.80 N	0.04 W	5.80 N	0 26 W	0.12
1050.00	0 22	N 18 0 W	30.00	1049.98	5.98 N	0.09 W	5.98 N	0 54 W	0.10
1080.00	0 21	N 5 54 W	30.00	1079.98	6.17 N	0.13 W	6.17 N	1 15 W	0.26
1110.00	0 21	N 4 42 E	30.00	1109.98	6.35 N	0.14 W	6.35 N	1 13 W	0.22
1140.00	0 21	N 7 54 E	30.00	1139.98	6.53 N	0.12 W	6.53 N	1 1 W	0.07
1170.00	0 12	N 71 48 E	30.00	1169.98	6.64 N	0.05 W	6.64 N	0 28 W	1.06
1200.00	0 28	S 43 6 E	30.00	1199.98	6.56 N	0.08 E	6.56 N	0 42 E	1.41
1230.00	0 24	S 40 36 E	30.00	1229.98	6.40 N	0.23 E	6.40 N	2 4 E	0.25
1260.00	0 29	S 55 36 E	30.00	1259.98	6.24 N	0.40 E	6.26 N	3 42 E	0.47
1290.00	0 33	S 41 0 E	30.00	1289.98	6.06 N	0.60 E	6.09 N	5 41 E	0.42
1320.00	0 24	S 27 18 E	30.00	1319.98	5.86 N	0.75 E	5.91 N	7 15 E	0.62
1350.00	0 20	S 67 36 E	30.00	1349.97	5.74 N	0.87 E	5.80 N	8 40 E	0.87
1380.00	0 17	S 85 48 E	30.00	1379.97	5.70 N	1.03 E	5.79 N	10 14 E	0.36
1410.00	0 19	S 72 6 E	30.00	1409.97	5.67 N	1.18 E	5.79 N	11 47 E	0.26
1440.00	0 21	S 74 0 E	30.00	1439.97	5.62 N	1.35 E	5.78 N	13 30 E	0.12
1470.00	0 21	N 54 12 E	30.00	1469.97	5.64 N	1.51 E	5.84 N	14 59 E	1.02
1500.00	0 21	N 64 42 E	30.00	1499.97	5.74 N	1.67 E	5.97 N	16 13 E	0.21
1530.00	0 21	N 62 6 E	30.00	1529.97	5.82 N	1.83 E	6.10 N	17 29 E	0.05
1560.00	0 12	N 80 30 E	30.00	1559.97	5.87 N	1.96 E	6.19 N	18 30 E	0.57
1590.00	0 20	S 60 0 E	30.00	1589.97	5.84 N	2.09 E	6.20 N	19 43 E	0.73
1600.00	0 24	S 60 12 E	10.00	1599.97	5.80 N	2.15 E	6.19 N	20 18 E	0.67

CLOSURE - DISTANCE : 6.19  
DIRECTION : N 20 18 E

REPORT UNITS : Feet  
SURVEY CALCULATION METHOD : Minimum curvature

SURVEY RUN INFORMATION

GYRO MULTISHOT FROM 30 TO 1600 M.D.  
JOB NO. 250-164 RUN ON 8-17-86



MEASURED DEPTH	DRIFT ANGLE		DRIFT DIRECTION		COURSE LENGTH	TRUE VERTICAL DEPTH	RECTANGULAR COORDINATES		CLOSURE		BOBLOG SEVERITY
	D	M	D	M			D	M	DISTANCE	DIRECTION	
0.00	0	0	N	0 0 E	0.00	0.00	0.00 N	0.00 E	0.00	S 90 0 E	0.00
30.00	0	18	N	3 30 W	30.00	30.00	0.08 N	0.00 W	0.08	N 3 30 W	1.00
60.00	0	18	N	2 6 E	30.00	60.00	0.24 N	0.01 W	0.24	N 1 38 W	0.10
90.00	0	18	N	5 48 W	30.00	90.00	0.39 N	0.01 W	0.39	N 1 43 W	0.14
120.00	0	11	N	17 0 E	30.00	120.00	0.52 N	0.01 W	0.52	N 0 38 W	0.50
150.00	0	27	N	15 6 E	30.00	150.00	0.68 N	0.04 E	0.68	N 3 18 E	0.89
180.00	0	16	N	11 30 E	30.00	180.00	0.86 N	0.08 E	0.86	N 5 34 E	0.62
210.00	0	21	N	16 54 E	30.00	210.00	1.01 N	0.12 E	1.02	N 6 59 E	0.27
240.00	0	16	N	3 0 E	30.00	240.00	1.17 N	0.15 E	1.18	N 7 31 E	0.37
270.00	0	17	N	4 36 W	30.00	270.00	1.31 N	0.15 E	1.32	N 6 36 E	0.13
300.00	0	21	N	5 30 W	30.00	300.00	1.48 N	0.14 E	1.49	N 5 18 E	0.22
330.00	0	21	N	1 0 W	30.00	330.00	1.66 N	0.13 E	1.67	N 4 22 E	0.09
360.00	0	21	N	3 0 W	30.00	359.99	1.85 N	0.12 E	1.85	N 3 44 E	0.04
390.00	0	16	N	4 54 E	30.00	389.99	2.01 N	0.12 E	2.01	N 3 28 E	0.31
420.00	0	19	N	24 18 W	30.00	419.99	2.15 N	0.09 E	2.15	N 2 30 E	0.52
450.00	0	21	N	9 0 E	30.00	449.99	2.32 N	0.07 E	2.32	N 1 50 E	0.65
480.00	0	19	N	16 18 W	30.00	479.99	2.49 N	0.06 E	2.49	N 1 30 E	0.50
510.00	0	26	N	10 30 W	30.00	509.99	2.68 N	0.02 E	2.68	N 0 27 E	0.41
540.00	0	21	N	1 0 W	30.00	539.99	2.88 N	0.00 W	2.88	N 0 1 W	0.35
570.00	0	22	N	11 18 E	30.00	569.99	3.07 N	0.02 E	3.07	N 0 18 E	0.26
600.00	0	21	N	3 42 E	30.00	599.99	3.25 N	0.04 E	3.25	N 0 43 E	0.17
630.00	0	21	N	1 36 E	30.00	629.99	3.44 N	0.05 E	3.44	N 0 49 E	0.04
660.00	0	19	N	20 54 E	30.00	659.99	3.61 N	0.08 E	3.61	N 1 18 E	0.39
690.00	0	21	N	3 48 E	30.00	689.99	3.77 N	0.12 E	3.78	N 1 46 E	0.35
720.00	0	21	N	10 12 W	30.00	719.99	3.96 N	0.11 E	3.96	N 1 33 E	0.28
750.00	0	26	N	9 6 E	30.00	749.99	4.16 N	0.11 E	4.16	N 1 30 E	0.52
780.00	0	21	N	8 54 W	30.00	779.99	4.36 N	0.11 E	4.36	N 1 29 E	0.49
810.00	0	22	N	16 42 W	30.00	809.99	4.54 N	0.07 E	4.54	N 0 53 E	0.17
840.00	0	21	N	10 42 W	30.00	839.99	4.73 N	0.03 E	4.73	N 0 19 E	0.14
870.00	0	21	N	6 54 E	30.00	869.99	4.91 N	0.02 E	4.91	N 0 14 E	0.36

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