

1W= G-2942



City of Pompano Beach

Engineering Well Completion Report Concentrate Disposal System

Prepared for:

City of Pompano Beach
City Project No.: 99-747
Bid No.: K-17-01

Prepared By:

Hazen and Sawyer, P.C.
In Association with
Water Technology Associates, Inc.
Project No.: 40368

May 2002

Appendix D
Geologic Log - (Drill Cuttings)
Concentrate Disposal Well IW-1
City of Pompano Beach

Depth (ft)	Thickness (ft)	Sample Description
0-10	10	SAND SANDSTONE AND SANDY LIMESTONE – Sand 50%, colorless, very coarse to very fine grained, unconsolidated, poorly sorted, subrounded quartz. Sandstone 30%, moderate brown (5YR 4/4) fine to medium grained, friable, highly argillaceous. Sandy Limestone 20%, grayish yellow (5Y 8/4) to yellowish gray (5Y 7/2) medium grained to cryptocrystalline, moderately hard, partly pelloidal, packstone with abundant medium grained angular colorless quartz.
10-20	10	LIMESTONE – 100% Yellowish gray (5Y 8/1) medium to fine grained, moderately hard, occasionally sparry, fossiliferous packstone with colorless fine grained subangular quartz.
20-40	20	LIMESTONE AND SANDSTONE – Limestone 60%, Grayish orange (10YR 7/4), coarse to fine grained, moderately to poorly cemented, fossiliferous wackestone to packstone with shell fragments. Sand 40%, coarse to fine grained, subangular to subrounded, poorly sorted unconsolidated quartz.
40-70	30	SAND AND LIMESTONE – Sand 95%, very coarse grained, subangular to subrounded, unconsolidated quartz. Limestone 5%, grayish orange (10YR 7/4) fossiliferous packstone with shell fragments.
70-80	10	SANDY LIMESTONE AND SAND– Sandy Limestone 90%, very pale orange (10YR 8/2) to moderate yellowish brown (10YR 5/2) fine to coarse grained, moderately hard to hard, fossiliferous, mudstone to packstone with shell fragments. Sand 10%, coarse to medium grained, subangular to subrounded, some moderately cemented with calcite, mostly unconsolidated quartz.
80-90	10	SANDY LIMESTONE AND SAND – Sandy Limestone 95%, Grayish orange (10YR 7/4) fine to coarse grained, fossiliferous, soft to moderately hard packstone to grainstone with shell fragments. Sand 5%, coarse to medium grained, angular to subrounded, poorly cemented to unconsolidated quartz.
90-100	10	SANDY LIMESTONE AND SAND – Sandy Limestone 80%, greenish gray (5GY 6/1) to very light gray (N8) fine to coarse grained wackestone to grainstone with coarse to medium grained sand and trace phosphorite. Sand 10%, colorless, coarse grained, subangular to subrounded, unconsolidated quartz. Trace to little shell, shell fragments and organics.
100-130	30	SANDY LIMESTONE AND SAND – Sandy Limestone 90%, Yellowish gray (5Y 8/1) to very pale orange (10YR 8/2) coarse to fine grained, mostly fossiliferous mudstone to packstone, with shell, shell fragments, and coarse to fine grained, subrounded sand. Sand 10%, medium to coarse grained, angular to rounded moderately to poorly cemented quartz. Trace light gray (N7) medium grained packstone.

Depth (ft)	Thickness (ft)	Sample Description
120-140	20	LIMY SANDSTONE AND SANDY LIMESTONE – Limy Sandstone 80%, Greenish gray (5GY 6/1) medium to fine grained, subrounded to rounded quartz, moderately to poorly sorted with coarse to fine grained, fossiliferous, moderately hard, with shell and little phosphorite, to medium grained, subrounded, moderately cemented. Sandy Limestone 20%, yellowish gray (5Y 7/2) fine to coarse grained, subrounded, moderately hard to hard wackestone with medium grained, subrounded, moderately sorted quartz sand. Trace phosphorite.
140-150	10	LIMY SANDSTONE – 100% Light olive gray (5Y 6/1) fine to medium grained, subrounded to rounded, well sorted with coarse grained wackestone, shell fragments and trace phosphorite.
150-160	10	SANDY LIMESTONE AND LIMY SANDSTONE – Sandy Limestone 80%, as above. Limy Sandstone 20%, yellowish gray (5Y 7/2) fine to coarse grained, subangular, colorless quartz in crystalline calcite matrix with shell fragments and trace phosphorite
160-200	40	LIMY SANDSTONE AND PHOSPHORITE – Limy Sandstone 95%, yellowish gray (5Y 8/1) to light olive gray (5Y 6/1) coarse to very fine grained, subrounded to rounded, moderately well sorted quartz with fine grained calcite and shell fragments. Phosphorite 5%, black (N9) medium grained, well sorted, moderately to well cemented.
200-220	20	SANDY LIMESTONE – 100% Light olive gray (5Y 6/1) to greenish gray (5GY 6/1) fine grained, wackestone, with mollusks and echinoids fragments with colorless, coarse to very fine grained, moderately sorted, angular to rounded quartz sand and trace phosphorite.
220-260	40	LIMY SANDSTONE – 100% Pale olive (10Y 6/2) to light olive gray (5Y 6/1) coarse to very fine grained, moderately hard to hard, angular to rounded, moderately to well sorted, slightly phosphatic quartz with 20% shell fragments and greenish gray (5GY 6/1) coarse to very fine grained, moderately sorted, angular to rounded limestone with trace phosphorite.
260-300	40	LIMY SANDSTONE – 100% Light olive gray (5Y 6/1) coarse to very fine grained, moderately cemented, angular to rounded, moderately to well sorted quartz with little shell fragments and trace interbedded coarse to very fine grained limestone. Trace Phosphorite.
300-310	10	LIMY SANDSTONE – 100% Light olive gray (5Y 6/1) medium to fine grained, angular to rounded, moderately to poorly cemented quartz with 30% Limestone, 15% shell fragments and trace phosphorite.
310-330	20	SANDY LIMESTONE – 100% Yellowish gray (5Y 8/1) to medium light gray (N6) medium to fine grained, moderately hard, fossiliferous packstone with colorless coarse to fine grained angular to rounded moderately sorted quartz sand and trace phosphorite.

Depth (ft)	Thickness (ft)	Sample Description
330-360	30	SANDY LIMESTONE AND LIMESTONE – Sandy Limestone 90%, yellowish gray (5Y 8/1) to light olive gray (5Y 5/2) medium to fine grained, moderately hard, fossiliferous wackestone with shell fragments and fine to medium grained angular to subangular quartz sand and trace phosphorite. Limestone 10%, white (N1) medium to fine grained moderately hard sandy packstone with little quartz sand.
360-380	20	LIMY SANDSTONE – 100% Light olive gray (5Y 5/2) to light olive gray (5Y 6/1) fine to coarse grained, moderately well cemented, angular to subangular quartz with carbonate mudstone, shell fragments and trace phosphorite.
380-390	10	CLAYEY LIMY SANDSTONE – 100% Light olive gray (5Y 6/1) medium to very fine grained, subangular quartz, moderately well cemented, with abundant calcareous clay, shell fragments and little phosphorite.
390-400	10	CLAYEY LIMY SANDSTONE, SANDSTONE AND LIMESTONE – Clayey Limy Sandstone 80%, as above. Sandstone 10%, light gray (N7) very fine grained, very well cemented with shell fragments and phosphorite. Limestone 10%, yellowish gray (5Y 8/1) coarse grained hard sandy packstone.
400-500	100	CLAYEY SANDY LIMESTONE – 100% light olive gray (5Y 5/2) fine grained, moderately hard, fossiliferous wackestone with clay, fine to very fine grained sand and little phosphorite. Clay content increasing below 480 feet. Trace coarse grained packstone with coarse sand at 430 feet. Trace coarse grained packstone at 480 feet.
500-510	10	SANDY CLAY AND CLAYEY SANDY LIMESTONE – Sandy Clay 70%, light olive gray (5Y 5/2) soft, moderately plastic calcareous with very fine grained quartz sand and little phosphorite. Clayey Sandy Limestone 30%, as above.
510-550	40	SANDY CLAY – 100%, light olive gray (5Y 5/2) non-plastic, moderately firm, with abundant very fine grained sand.
550-580	30	SANDY CLAY AND LIMY SANDSTONE – Sandy Clay 70%, light olive gray (5Y 5/2) very soft, moderately plastic, with abundant fine grained quartz and little phosphorite. Limy Sandstone 30%, medium light gray (N6) fine grained, well cemented, with medium grained fossiliferous limestone and trace phosphorite.
580-630	50	SANDY CLAY – 100% Grayish olive (10Y 4/2) very soft, non-plastic, phosphatic, slightly calcareous with fine grained quartz.
630-650	20	SANDY CLAY – 100%, Yellowish gray (5Y 7/2) soft, low plasticity, slightly calcareous, with very fine grained quartz and little phosphorite.
650-660	10	SANDY CLAY – 100% Greenish gray (5GY 6/1) very soft, non plastic with very fine grained quartz and trace phosphorite.
660-670	10	CLAYEY SAND – 100% Yellowish gray (5Y 7/4) very fine grained, unconsolidated quartz with clay.

Depth (ft)	Thickness (ft)	Sample Description
670-730	60	SANDY CLAY – 100% Pale olive (10Y 6/2) soft, low plasticity, calcareous, with very fine grained quartz sand. Occasional clayey sand lenses at 680 feet, trace limestone at 690 feet.
730-750	20	SANDY CLAY AND LIMESTONE – Sandy Clay 70%, as above. Limestone 30%, yellowish gray (5Y 7/2) fine grained, moderately soft wackestone.
750-760	10	CLAY – 100% Yellowish gray (5Y 7/2) soft, low plasticity, silty, slightly phosphatic with trace chert.
760-800	40	SANDY CLAY – 100% Yellowish gray (5Y 7/2) stiff to hard, moderately plastic, slightly phosphatic with very fine grained quartz sand.
800-850	50	SANDY CLAY – 100% Pale olive (10Y 6/2) stiff to hard, moderately plastic with very fine grained quartz sand.
850-870	20	SANDY CLAY AND PHOSPHORITE – Sandy clay 80%, as above. Phosphorite 20%, black (N9) fine grained, hard, occurring as granules.
870-900	30	SANDY CLAY – 100% Pale olive (10Y 6/2) very stiff to hard, plastic, calcareous, with little fine grained limestone, and abundant very fine grained sand.
900-910	10	CLAY AND CHERT – Clay 90%, light olive gray (5Y 5/2) hard, plastic. Chert 10%, olive gray (5Y 3/2) very fine grained, very hard.
910-940	30	SANDY CLAY – 100% Pale olive (10Y 6/2) firm to hard, calcareous, with fine grained quartz sand and little phosphorite. Trace pale olive (10Y 6/2) clayey phosphatic Limestone at 930.
940-950	10	SANDY CLAYEY LIMESTONE – 100% Yellowish gray (5 Y 7/2) fine to medium grained, very soft to moderately soft, phosphatic wackestone with fine to medium grained quartz sand. Trace to few shell fragments and fossils.
950-970	20	SANDY CLAY AND SANDY CLAYEY LIMESTONE – Sandy Clay 80%, pale olive (10Y 6/2) soft, plastic with very fine grained quartz sand. Sandy Clayey Limestone 20% as above.
970-1000	30	CLAYEY LIMESTONE AND SANDY CLAY – Clayey Limestone 70%, light olive gray (5Y 5/2) medium grained, hard fossiliferous, phosphatic wackestone. Sandy Clay 30%, as above.
1000-1030	30	LIMESTONE – 100%; 80% Yellowish gray (5Y 8/1) to medium grained moderately hard packstone. 20% Pale yellowish gray (5Y 9/1) cryptocrystalline, moderately hard carbonate mudstone.
1030-1040	10	LIMESTONE – 100% Yellowish gray (5Y 8/1) fine grained to cryptocrystalline, moderately hard wackestone to carbonate mudstone.

Depth (ft)	Thickness (ft)	Sample Description
1040-1050	10	LIMESTONE – 100%; 70% Greenish gray (5GY 6/1) fine to very coarse grained, moderately hard, slightly sparry, fossiliferous wackestone with trace casts. 30% Pale olive (10Y 6/2) fine to medium grained, moderately soft, fossiliferous, slightly phosphatic, slightly sandy packstone.
1050-1070	20	SANDSTONE AND LIMESTONE – Sandstone 60%, light olive gray (5Y 5/1) fine to medium grained, poorly sorted, poorly cemented, slightly phosphatic. Limestone 40%, yellowish gray (5Y 8/1) cryptocrystalline to coarse grained, fossiliferous, occasionally slightly sandy wackestone with trace molds. Trace forams.
1070-1160	90	LIMESTONE – 100% Very pale orange (10YR 8/2) medium grained, moderately soft to soft packstone with tests and forams. Trace dark gray (N3) very fine grained Limestone at 1140. Trace medium grained fossiliferous packstone at 1150.
1160-1200	40	LIMESTONE – 100% Very pale orange (10YR 8/2) to grayish orange (10YR 7/4) medium grained, moderately soft to moderately hard packstone with few forams.
1200-1270	70	LIMESTONE – 100%; 70% Very pale orange (10YR 8/2) to grayish orange (10YR 7/4) as above. 30% Yellowish gray (5Y 8/1) fine grained moderately soft to soft, slightly vuggy wackestone. Trace light olive gray hard carbonate mudstone at 1160.
1270-1380	110	LIMESTONE – 100% Pale yellowish brown (10YR 6/2) to yellowish gray (5Y 8/1) medium to fine grained, moderately soft packstone to rarely grainstone with 10% to 20% forams. Trace yellowish gray (5Y 8/1) highly vuggy carbonate mudstone at 1320. Trace medium light gray (N6) fine grained hard wackestone at 1360. Trace test at 1370.
1380-1410	30	LIMESTONE – 100%; 80% Yellowish gray (5Y 8/1) medium grained moderately soft pelloidal packstone. 20% Light gray (N7) hard carbonate mudstone. Trace forams. Trace interbedded Dolomitic Limestone at 1400.
1410-1430	20	LIMESTONE – 100%; 70% Yellowish gray (5Y 8/1) medium to fine grained, moderately soft, pelloidal packstone. 20% Very light gray (N8) cryptocrystalline, moderately hard carbonate mudstone. 10% Dark gray (N7) medium grained, hard, fossiliferous wackestone. Abundant forams.
1430-1460	30	LIMESTONE – 100%; 80%-60% Yellowish gray (5Y 8/1) coarse to fine grained, moderately soft to moderately hard, pelloidal packstone to grainstone. 10%-20% Yellowish gray (5Y 8/1) cryptocrystalline, hard carbonate mudstone. 10%-20% Very light gray (N8) as above.
1460-1480	20	LIMESTONE AND DOLOMITE – Limestone 90%; 70% Very pale orange (10YR 8/2) to yellowish gray (5Y 8/1) fine to medium grained, moderately soft to moderately hard, pelloidal packstone/grainstone with trace Dolomitic laminations. 20% Medium dark gray (N4) to medium light gray (N6) fine grained, moderately hard, vuggy wackestone. Dolomite 10%, dark yellowish brown (10YR 4/2) microcrystalline, hard sucrossic.

Depth (ft)	Thickness (ft)	Sample Description
1480-1500	20	LIMESTONE AND DOLOMITE - Limestone 90%; 70% Very pale orange (10YR 9/2) cryptocrystalline, moderately hard, very slightly vuggy carbonate mudstone. 30% Very pale orange (10YR 8/2) to light olive gray (5Y 6/1) medium to coarse grained, pelloidal packstone to grainstone. 20% Medium gray (N5) fine grained, hard wackestone. Dolomite 10%-20% as above.
1500-1510	10	LIMESTONE AND SANDSTONE - Limestone 70% as above. Sandstone 30%, moderate yellowish brown (10YR 5/4) fine to very fine grained, moderately cemented. Trace Dolomite as above.
1510-1520	10	LIMESTONE - 100%; 80% Very pale orange (10YR 8/2) fine to medium grained, moderately soft, fossiliferous packstone. 20% Pale yellowish brown (10YR 6/2) cryptocrystalline, hard, carbonate mudstone. Trace to little forams. Trace Sandstone as above.
1520-1530	10	LIMESTONE - 100%; 80% Yellowish gray (5Y 8/1) medium grained, moderately soft to moderately hard, fossiliferous, partly sparry packstone to rarely grainstone. 20% White (N9) to very light gray (N8) cryptocrystalline, moderately hard, slightly vuggy, carbonate, mudstone. Few forams and tests. Trace light olive gray (5Y 6/1) microcrystalline hard Dolomite.
1530-1550	20	LIMESTONE AND DOLOMITE - Limestone 70% as above. Dolomite 30% moderate yellowish brown (10YR 5/4) to dark yellowish brown (10YR 4/2) fine grained to microcrystalline, moderately hard to hard. Trace fine grained, slightly phosphatic Sandstone. Trace to few forams.
1550-1560	10	LIMESTONE - 100% Very pale orange (10YR 8/2) to pale yellowish brown (10YR 6/2) fine to medium grained, very soft to soft packstone with few forams.
1560-1580	20	LIMESTONE - 100%; 90% As above. 10% Medium dark gray (N4) very fine grained wackestone/packstone.
1580-1590	10	LIMESTONE - 100%; 60% Very pale orange (10YR 8/2) medium to fine grained, moderately soft packstone to grainstone. 20% Pale yellowish brown (10YR 6/2) cryptocrystalline, hard carbonate mudstone. 20% Pale yellowish brown (10YR 6/2) to grayish brown (5YR 3/2) fine to medium grained, hard, occasionally fossiliferous wackestone. Few flat forams up to 10 mm in diameter.
1590-1600	10	LIMESTONE - 100%; 90% Grayish orange (10YR 7/4) fine to medium grained, moderately soft, pelloidal, slightly fossiliferous packstone. 10% Very pale orange (10YR 8/2) cryptocrystalline, hard carbonate mudstone. Few forams and tests. Trace Dolomitic Limestone.
1600-1610	10	LIMESTONE - 100%; 80% Grayish orange (10YR 7/4) to very pale orange (10YR 8/2) fine grained, moderately soft to moderately hard, rarely slightly Dolomitic packstone. 20% Medium dark gray (N4) fine grained, hard wackestone to carbonate mudstone. Trace forams.

Depth (ft)	Thickness (ft)	Sample Description
1610-1630	20	LIMESTONE - 100%; 60% Very pale orange (10YR 8/2) fine to medium grained, moderately soft packstone. 30% Light olive gray (5Y 8/1) to light olive gray (5Y 6/1) medium grained, hard, fossiliferous wackestone to carbonate mudstone.
1630-1640	10	LIMESTONE - 100% Grayish orange (10YR 7/4) fine grained, soft to moderately soft packstone with abundant forams.
1640-1650	10	LIMESTONE - 100%; 90% Very pale orange (10YR 8/2) to pale yellowish brown (10YR 6/2) fine to medium grained, moderately hard packstone. 10% Pale yellowish brown (10YR 6/2) cryptocrystalline, hard, slightly vuggy carbonate mudstone.
1650-1660	10	LIMESTONE - 100%; 60% Very pale orange (10YR 8/2) to pale yellowish brown (10YR 6/2) as above. 30% Medium gray (N5) dominantly fine to medium grained, micritic, locally vuggy wackestone. 10% Pale yellowish brown (10YR 6/2) as above.
1660-1670	10	LIMESTONE - 100%; 60% Yellowish gray (5Y 8/1) fine grained, moderately soft wackestone. 30% Medium dark gray (N4) to olive gray (5Y 4/1) fine grained, hard, slightly vuggy, micritic wackestone. 10% Yellowish gray (5Y 8/1) cryptocrystalline, hard carbonate mudstone.
1670-1680	10	LIMESTONE- 100% Yellowish gray (5Y 8/1) to very pale orange (10YR 8/2) fine grained, moderately soft, slightly vuggy packstone. Trace to little medium dark gray (N4) wackestone as above.
1680-1700	20	LIMESTONE- 100%; 50% Olive gray (5Y 4/1) to dark gray (N3) fine to medium grained, soft to moderately hard, fossiliferous packstone to wackestone. 40% Very pale orange (10YR 8/2) to yellowish gray (5Y 8/1) fine to medium grained, moderately soft, pelloidal packstone. 10% Yellowish gray (5Y 8/1) to light gray (N7) cryptocrystalline, hard carbonate mudstone. Trace to few forams and test.
1700-1710	10	LIMESTONE - 100%; 90% Very pale orange (10YR 8/2) to grayish orange (10YR 7/4) fine to very fine grained, moderately soft, locally slightly Dolomitic, packstone to wackestone. 10% Pale olive gray (5Y 6/1) cryptocrystalline, hard, slightly vuggy carbonate mudstone. Few forams and test.
1710-1725	15	LIMESTONE - 100%; 70% Very pale orange (10YR 8/2) to pale yellowish brown (10YR 6/2) medium grained, moderately hard, fossiliferous, partly slightly Dolomitic grainstone to packstone. 20% Yellowish gray (5Y 8/1) hard, microcrystalline to cryptocrystalline, carbonate mudstone. 10% Medium gray (N5) fine grained, moderately hard to hard, fossiliferous wackestone. Few forams and test.
1725-1738	13	CORE # 1

Depth (ft)	Thickness (ft)	Sample Description
1738-1785	57	LIMESTONE – 100%; 70% yellowish gray (5Y 8/1) to occasionally olive gray (5Y 4/1) fine to very fine grained, moderately soft to hard, well cemented, fossiliferous, partly sparry packstone. 30% Yellowish gray (5Y 8/1) to light olive gray (5Y 6/1) very fine grained wackestone to carbonate mudstone. Trace to few forams and test. Trace Dolomitic Limestone and neomorphic calcite.
1795-1806	11	CORE #2
1806-1810	4	LIMESTONE – 100%; 60% Yellowish gray (5Y 8/1) to light gray (N7) fine grained, hard wackestone. 40% Yellowish gray (5Y 8/1) fine to medium grained, moderately soft packstone. Trace soft Dolomitic packstone. Trace to few forams and tests.
1810-1840	30	LIMESTONE AND DOLOMITE – Limestone 90%–80%; 60% Pale yellowish brown (10YR6/2) to medium light gray (N6) fine grained, moderately hard wackestone to mudstone. 40% Pale yellowish brown (10YR 6/2) to medium light gray (N6) medium to fine grained, moderately soft packstone, percentage decreasing with depth. Dolomite 10%–20% Dark yellowish brown (10YR 4/2) very fine grained, fossiliferous, occasionally limy, percentage increasing with depth. Trace Dolomitic Limestone. Few tests and forams.
1840-1850	10	DOLOMITE – 100% Moderate yellowish brown (10YR 5/4) to rarely grayish black (N2) fine grained to microcrystalline, moderately hard to very hard, sucrosic. Trace very pale orange (10YR 8/2) fine to very fine grained, moderately hard, rarely micritic packstone to wackestone
1850-1876.5	26.5	DOLOMITE AND LIMESTONE – Dolomite 70%, as above. Limestone 30%, very pale orange (10YR 8/2) fine to very fine grained, moderately hard, rarely micritic packstone to wackestone.
1876.5-1887.5	11	CORE #3
1887.5-1900	12.5	DOLOMITE AND DOLOMITIC LIMESTONE – Dolomite 70%; 60% dark yellowish brown (10YR 4/2) to dusky yellowish brown (10YR 2/2), very fine grained, very hard, weakly vuggy, sucrosic. 40% Pale yellowish brown (10YR 6/2) cryptocrystalline, very hard. Dolomitic Limestone 30%, pale yellowish brown (10YR 6/2) cryptocrystalline, hard, slightly vuggy, carbonate mudstone with very fine grained Dolomite inclusions.
1900-1920	20	LIMESTONE, DOLOMITE AND DOLOMITIC LIMESTONE – Limestone 70%, very pale orange (10YR 8/2) fine to rarely medium grained, dominantly hard to rarely moderately hard, well indurated, occasionally dolomitic packstone to rarely wackestone. Dolomite 20%, dark yellowish brown (10YR 4/2) to dusky yellowish brown (10YR 2/2) fine grained to microcrystalline, very hard. Dolomitic Limestone 10%, pale yellowish brown (10YR 6/2) cryptocrystalline, very hard carbonate mudstone with microcrystalline Dolomite inclusions.
1920-1930	10	CORE #4

Depth (ft)	Thickness (ft)	Sample Description
1930-1940	10	LIMESTONE – 100%; 60% Very pale orange (10YR 8/2) medium grained, hard, well indurated, fossiliferous packstone with forams and tests. 30% Very pale orange (10YR 8/2) coarse to medium grained, moderately hard fossiliferous grainstone with forams. 10% Very pale orange (10YR 8/2) cryptocrystalline, hard weakly vuggy carbonate mudstone with trace neomorphic calcite.
1940-1950	10	LIMESTONE – 100%; 60% Very pale orange (10YR 8/2) cryptocrystalline, hard, rarely very weakly vuggy carbonate mudstone. 20% Very pale orange (10YR 8/2) hard, very fine grained wackestone. 10% Olive gray (5Y 4/1) cryptocrystalline, hard micritic mudstone. 10% White (N9) very soft, fossiliferous carbonate marl.
1950-1960	10	LIMESTONE – 100%; 80% Very pale orange (10YR 8/2) to grayish orange (10YR 7/4) fine to medium grained, moderately soft to occasionally moderately hard, well indurated, fossiliferous, partly Dolomitic packstone with forams. 20% Very pale orange (10YR 8/2) very fine grained, hard, vuggy wackestone. Abundant forams.
1960-1970	10	CORE #5
1970-1975	5	LIMESTONE – 100%; 60% Grayish orange (10YR 7/4) fine to medium grained, hard, fossiliferous packstone. 20% Medium dark gray (N4) microcrystalline to cryptocrystalline, very hard, weakly vuggy carbonate mudstone, vuggs occasionally lined with euhedral Dolomite rhombs. 20% Light olive gray (5Y 6/1) fine to medium grained, hard, fossiliferous wackestone with tests.
1975-1985	10	CORE #6
1985-2000	15	DOLOMITE – 100%; 90% Yellowish brown (10YR 5/2) coarse grained to cryptocrystalline, very hard with few crystal filled vuggs. 10% Black olive (5Y 2/1) medium grained, very hard.
2000-2010	10	CORE #7
2010-2020	10	DOLOMITE AND LIMESTONE – Dolomite 90%, dark yellowish brown (10YR 4/2) to grayish orange (10YR 7/4) microcrystalline, very hard, sucrosic. Limestone 10%, very pale orange (10YR 8/2) fine to occasionally medium grained, generally moderately soft, partly sparry packstone.
2020-2030	10	CORE #8
2030-2040	10	DOLOMITE AND DOLOMITE BRECCIA – 100%; 80% Moderate yellowish brown (10YR 5/4) microcrystalline, very hard, partly sucrosic. 10% Pale yellowish brown (10 YR 6/2) cryptocrystalline very hard. Dolomite Breccia 10%, moderate yellowish brown (10YR 5/4) to pale yellowish brown (10 YR 6/2), lighter colored angular fragments in darker colored matrix (matrix > clast supported) very hard.
2040-2070	30	DOLOMITE – 100%; 60%-80% Moderate yellowish brown (10YR 5/4) to pale yellowish brown (10 YR 6/2) cryptocrystalline to microcrococrystalline, very hard. 40%-20% Pale yellowish brown (10 YR 6/2) to grayish orange (10YR 7/4) microcrystalline to fine grained, moderately vuggy, moderately hard, partly sucrosic.

Depth (ft)	Thickness (ft)	Sample Description
2070-2140	70	DOLOMITE - 100%, Moderate yellowish brown (10YR 5/4) to dark yellowish brown (10YR 4/2) fine grained to cryptocrystalline, very hard, dominantly sucrosic, rarely weakly vuggy at 2120. Trace very pale orange (10 YR 8/2) Dolomitic Limestone at 2130.
2140-2160	20	DOLOMITE AND LIMESTONE - Dolomite 60%-80%, light olive gray (5Y 5/2) to moderate yellowish brown (10YR 5/4) dominantly very fine grained to cryptocrystalline, rarely medium to coarse grained, hard to very hard. Limestone 40%-20% very pale orange (10YR 8/2) fine grained, moderately soft, pelloidal grainstone to packstone occasionally containing medium grained euhedral Dolomite crystals. Trace tests. Trace very light gray (N8) fine grained, poorly cemented euhedral Dolomite 2160.
2160-2220	60	DOLOMITE AND LIMESTONE - Dolomite 80%, grayish orange (10YR 7/4) to dark yellowish orange (10YR 6/6) to moderate yellowish brown (10YR 5/4) fine grained to cryptocrystalline, grain size generally decreasing with depth, hard, well cemented, very well indurated, angular anhedral to uhedral rhomohedral Dolomite crystals. Limestone 20% very pale orange (10YR 8/2) fine grained to cryptocrystalline, soft to moderately hard wackestone to carbonate marl. Trace Dolomitic Limestone at 2210.
2220-2230	10	DOLOMITE AND DOLOMITIC LIMESTONE - Dolomite 70%, dominantly moderate yellowish brown (10YR 5/4) to dusky yellowish brown (10YR 2/2) medium grained to very fine grained, moderately to well cemented anhedral to uhedral rohmbohedral Dolomite crystals. Dolomitic Limestone 30%, very pale orange (10YR 8/2) medium grained moderately soft pelloidal packstone with anhedral and euhedral dolomite rhombs.
2230-2250	20	DOLOMITE AND LIMESTONE - Dolomite 60%, dark yellowish orange (10YR 6/6) as above. Limestone 40%, very pale orange (10YR 8/2) medium to fine grained, moderately soft partly Dolomitic grainstone to packstone.
2250-2270	20	DOLOMITE AND DOLOMITIC LIMESTONE - Dolomite 90%, dark yellowish brown (10YR 4/2) to rarely dusky yellowish brown (10YR 2/2) fine grained moderately well cemented, moderately hard anhedral to euhedral rhombahedral crystals. Dolomitic Limestone 10%, very pale orange (10YR 8/2) fine grained, moderately soft, moderately to highly Dolomitic grainstone to packstone.
2270-2280	10	DOLOMITIC LIMESTONE, DOLOMITE AND LIMESTONE - Dolomitic Limestone 40%, grayish orange (10YR 7/4) medium to fine grained, moderately soft to moderately hard, pelloidal, fossiliferous packstone with auhedral to euhedral rhombahedral crystal matrix. Dolomite 40%, moderate yellowish brown (10YR 5/4) medium to fine grained, anhedral to euhedral rohomhedral crystals, poorly to moderately cemented. Limestone 20%, very pale orange (10YR 8/2) very fine to medium grained, moderately soft to very soft packstone to carbonate marl.
2280-2290	10	DOLOMITE AND LIMESTONE - Dolomite 90% as above. Limestone 10% as above.

Depth (ft)	Thickness (ft)	Sample Description
2290-2300	10	DOLOMITE – 100% Moderate yellowish brown (10YR 5/4) medium to very fine grained, anhedral to euhedral rhombohedral crystals, poorly to moderately well cemented with few distinct to prominent mottles.
2300-2310	10	DOLOMITE AND LIMESTONE – Dolomite 50%, as above. Limestone 50%, very pale orange (10YR 8/2) medium to fine grained, moderately hard to moderately soft, pelloidal, partly sparry, partly Dolomitic packstone to grainstone.
2310-2320	10	LIMESTONE AND DOLOMITE – Limestone 90%, very pale orange (10YR 8/2) dominantly fine to very fine grained to rarely medium grained, moderately hard to weakly to moderately soft, pelloidal, fossiliferous, partly sparry grainstone to packstone. Dolomite 10%, moderate yellowish brown, microcrystalline to cryptocrystalline, very hard.
2320-2500	180	LIMESTONE –100% as above. Trace forams at 2330. Trace to little grayish orange (10YR 7/4) very fine grained to cryptocrystalline Dolomite. Trace Dolomite below 2400. Little Dolomitic Limestone and trace tests at 2500.
2500-2520	20	LIMESTONE AND DOLOMITE – Limestone 60%, very pale orange (10YR 8/2) medium to fine grained, moderately hard to rarely soft, pelloidal packstone with trace tests. Dolomite 40%, dark yellowish orange (10YR 6/8) medium to fine grained, anhedral to euhedral, crystals moderately cemented, partly limy.
2520-2540	20	LIMESTONE AND DOLOMITE – Limestone 60% as above. Dolomite 40% moderate yellowish brown (10YR 5/4) to dark yellowish orange (10YR 6/6) medium to very fine grained, hard, partly limy. Trace very pale orange (10YR 8/2) cryptocrystalline carbonate mudstone.
2540-2600	60	DOLOMITE AND LIMESTONE – Dolomite 70%-90%, as above. Limestone 30%-10%, very pale orange (10YR 8/2) medium to fine grained, moderately soft, weakly to moderately indurated, dominantly packstone to grainstone with minor amounts of very pale orange (10YR 8/2) carbonate mudstone.
2600-2610	10	LIMESTONE AND DOLOMITE – Limestone 50%-40%, very pale orange (10YR 8/2) medium to fine grained, moderately soft to moderately hard packstone to grainstone, 10%, very pale orange (10YR 8/2) cryptocrystalline, hard, carbonate mudstone. Trace tests. Dolomite 50%, dark yellowish orange (10YR 6/6) dominantly microcrystalline to cryptocrystalline, moderately hard to hard, partly sucrosic.
2610-2630	20	DOLOMITE – 100% Moderate yellowish brown (10YR 5/4) to dark yellowish orange (10YR 6/6) fine grained to microcrystalline, hard, partly sucrosic with distinct mottles common at 2620.
2630-2680	50	DOLOMITE AND LIMESTONE – Dolomite 90%-80%, dark yellowish orange (10YR 6/6) to rarely moderate yellowish brown (10YR 5/4) fine grained to cryptocrystalline, hard, sucrosic. Limestone 10%-20%, very pale orange (10YR 8/2) medium to fine grained, soft to moderately soft, pelloidal grainstone to packstone.

Depth (ft)	Thickness (ft)	Sample Description
2680-2740	60	DOLOMITE – 100% Moderate yellowish brown (10YR 5/4) very fine grained to cryptocrystalline, grain decreasing with depth, hard to very hard sucrosic. Trace pale yellowish brown (10YR 6/2) and dusky yellowish brown (10YR 2/2) Dolomite below 2730. Pale yellowish brown component rarely slightly glauconitic at 2730.
2740-2750	10	DOLOMITE – 100% Dark yellowish brown (10YR 4/2) to moderately yellowish brown (10YR 5/4) to pale yellowish brown (10YR 6/2) medium grained to cryptocrystalline, very well sorted, larger grains dominantly euhedral crystals, pale yellowish brown component rarely slightly glauconitic.
2750-2760	10	DOLOMITE AND LIMESTONE – Dolomite 70%; 60%as above. 10% Dark yellowish brown (10YR 4/2) to moderate yellowish brown (10YR 5/4) to rarely dusky yellowish brown (10 YR 2/2) coarse to medium grained, euhedral to subhedral rohomohedral crystals, moderately to very well indurated. Dusky yellowish brown component limy. Limestone 30%-20%, very pale orange (10YR 8/2) very fine grained, moderately hard, very well indurated wackestone. 10% very pale orange (10YR 8/2) medium to fine grained, moderately soft, pelloidal, slightly fossiliferous packstone. Trace tests.
2760-2780	20	LIMESTONE – 100%; 70% Very light gray (N8) to yellowish gray (5Y 8/1) cryptocrystalline, hard, weakly vuggy carbonate mudstone. 30% Very pale orange (10YR 8/2) medium to fine grained, moderately soft to hard, packstone to wackestone.
2780-2950	170	LIMESTONE – 100% Very pale orange (10YR 9/2) medium to fine grained, soft to moderately hard, pelloidal grainstone to packstone. Trace tests. Trace to little moderate yellowish brown (10YR 5/4) cryptocrystalline to fine grained Dolomite from 2830 to 2860.
2950-3000	50	LIMESTONE AND DOLOMITE– Limestone 70%; 60% as above. 10% Pale olive gray (5Y 7/1) cryptocrystalline, hard, carbonate mudstone vuggy and fractured at 2970, fractures and vuggs healed and filled with neomorphic calcite. Dolomite 30% moderate yellowish brown (10YR 5/4) cryptocrystalline to very fine grained, very hard.