

Well NCWRF-IW1

North Collier Water Reclamation Facility

Well Completion Report
for
IW-1 and DZMW
Volume 3
Appendices 2.2 to 3.1

Collier County

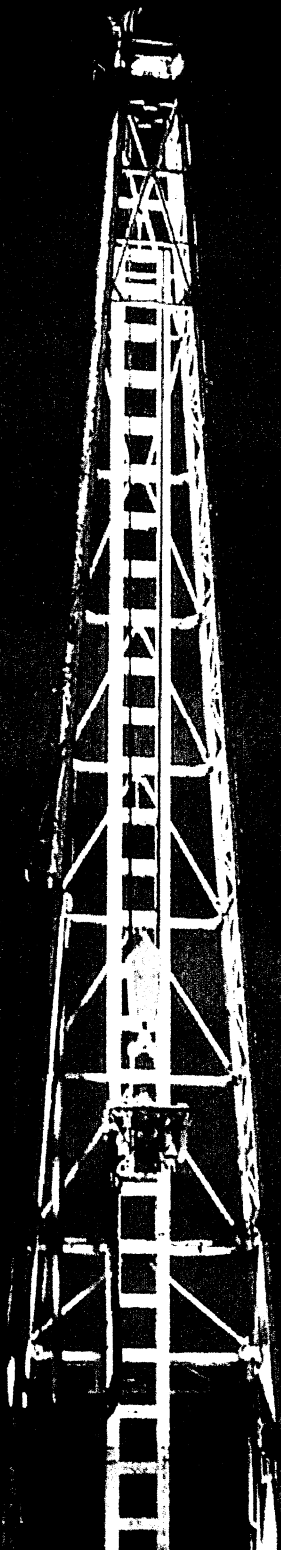
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APPENDIX 2.3
GEOLOGIST'S LOG

North County Water Reclamation Facility
Lithologic Description of Drill Cuttings From Well IW-1

Interval (feet bpl)	Thickness (feet)	Sample Description
0-10	10	ORGANICS - vegetative matter with minor fine quartz sand
10-30	20	CLAYEY SAND - very light gray (N8), fine grained, silty, abundant shell fragments, poor to fair apparent porosity and permeability.
30-40	10	CLAY - light greenish gray (5GY 8/1), soft, fine quartz sandy, silty, finely phosphatic, interbedded with shell fragments, poor apparent porosity and permeability.
40-50	10	CLAY - pale olive (10Y 6/2), soft, silty, fine quartz sandy, finely phosphatic, with common fragments of limestone and shell, poor apparent porosity and permeability.
50-60	10	LIMESTONE AND CLAY - yellowish gray (5Y 8/1), grainstone, friable, sparry, common shell fragments and coral. Clay - pale olive (10Y 6/2), soft, silty, fine quartz sandy, finely phosphatic, with common fragments of limestone and shell. Fair to poor apparent porosity and permeability.
60-70	10	LIMESTONE - light gray (N7) to yellowish gray (5Y 8/1), grainstone to fossil packstone, moderately indurated to friable, variably sparry, common fragments of shell and coral, good apparent porosity and permeability.
70-80	10	LIMESTONE - light gray (N7) to yellowish gray (5Y 8/1), grainstone to fossil packstone, moderately indurated to friable, variably sparry, minor fragments of shell and coral, good apparent porosity and permeability.
80-100	20	LIMESTONE - yellowish gray (5Y 8/1), grainstone, moderately indurated to friable, sparry, sparsely very finely phosphatic, common fragments of shell and coral, good apparent porosity and permeability.
100-120	20	LIMESTONE - yellowish gray (5Y 7/2), grainstone, friable, finely phosphatic, common sparry grainstone, common shell fragments, good apparent porosity and permeability.
120-130	10	LIMESTONE - yellowish gray (5Y 7/2), grainstone, friable, fine quartz sandy, finely phosphatic, common shell fragments, good inter-granular porosity and permeability.
130-140	10	Shell fragments interbedded w/ clay, light gray (N7), soft, fine quartz sandy, silty, minor limestone as above
140-150	10	LIMESTONE - yellowish gray (5Y 7/2), fossil packstone, moderately indurated to friable w/ common shell fragments, fair to good apparent porosity and permeability.

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150-185	35	CLAY - light greenish gray (5GY 8/1), soft, fine quartz sandy, silty, finely phosphatic, common fragments of limestone, minor shell fragments, poor apparent porosity and permeability.
185-220	35	CLAY - greenish gray (5GY 6/1), soft to firm, sticky, silty, fine quartz sandy, finely phosphatic, common fragments of shell and limestone, poor apparent porosity and permeability.
220-250	30	CLAY - greenish gray (5G 6/1), soft to firm, sticky and gummy, silty, fine quartz sandy, finely phosphatic, common fragments of shell and limestone, poor apparent porosity and permeability.
250-260	10	LIMESTONE - yellowish gray (5Y 8/1), packstone, moderately indurated to friable, sparry, finely phosphatic, common fragments of shell and coral, fair apparent porosity and permeability.
260-330	70	LIMESTONE - yellowish gray (5Y 8/1) and yellowish gray (5Y 7/2), packstone/grainstone, moderately indurated to friable, sparry, finely phosphatic, occasional quartz sand, fossiliferous, common fragments of shell and coral, fair to good apparent porosity and permeability.
330-340	10	LIMESTONE AND CLAY - yellowish gray (5Y 8/1) and yellowish gray (5Y 7/2), packstone/grainstone, moderately indurated to friable, sparry, finely phosphatic, occasional quartz sand, fossiliferous, common fragments of shell and coral, fair to good apparent porosity and permeability. Clay - greenish gray (5GY 6/1), soft to firm, sticky, silty, phosphatic.
340-350	10	LIMESTONE - yellowish gray (5Y 8/1) and yellowish gray (5Y 7/2), packstone/grainstone, moderately indurated to friable, sparry, finely phosphatic, common fragments of shell and coral, fair to good apparent porosity and permeability.
350-360	10	LIMESTONE - yellowish gray (5Y 8/1) and yellowish gray (5Y 7/2), packstone/grainstone, moderately indurated to friable, finely phosphatic, common fragments of shell and coral, fair to good apparent porosity and permeability.
360-370	10	LIMESTONE - yellowish gray (5Y 8/1), packstone, moderately indurated to friable, finely phosphatic, common fragments of shell and coral, fair to good apparent porosity and permeability.
370-380	10	LIMESTONE - yellowish gray (5Y 8/1), packstone, moderately indurated to friable, finely phosphatic, silty, minor Lime mud, yellowish gray (5Y 8/1), non-cohesive, minor Clay, dark greenish gray (5G 4/1), slightly cohesive, abundant fine-grained phosphate, poor to fair apparent porosity and permeability.
380-390	10	CLAY AND LIMESTONE - light olive gray (5Y 5/2) to pale olive (10Y 6/2), soft to firm, very silty, sparsely finely phosphatic and Limestone - yellowish gray (5Y 8/1), grainstone, moderately well indurated, variably sparry, finely phosphatic, common fragments of shell and coral, fair apparent porosity and permeability.

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390-396	6	DOLOSILT AND LIMESTONE - pale olive (10Y 6/2), very soft, abundantly finely phosphatic. Limestone - yellowish gray (5Y 8/1), grainstone, moderately well indurated, variably sparry, finely phosphatic, common fragments of shell and coral, fair apparent porosity and permeability.
396-400	4	LIMESTONE - yellowish gray (5Y 8/1), grainstone, moderately well indurated, variably sparry, finely phosphatic, common fragments of shell and coral, fair apparent porosity and permeability.
400-410	10	LIMESTONE AND CYRSTALLIZED LIMESTONE - yellowish gray (5Y 8/1), grainstone, friable to poorly indurated, finely phosphatic, occasional sand, common shell, fair to good apparent porosity and permeability. Crystallized Limestone - yellowish gray (5Y 7/2) to light olive gray (5Y 5/2), moderately to well indurated, finely phosphatic, moldic, good moldic apparent porosity and permeability.
410-415	5	LIMESTONE AND CRYSTALLIZED LIMESTONE - yellowish gray (5Y 7/2), packstone/grainstone, moderately indurated to friable, finely phosphatic, fossiliferous, common shell fragments, fair to good apparent porosity and permeability. Crystallized Limestone - yellowish gray (5Y 7/2), moderately to well indurated, finely phosphatic, moldic, good moldic apparent porosity and permeability.
415-420	5	LIMESTONE - yellowish gray (5Y 8/1), grainstone/packstone, moderately indurated to friable, fossiliferous, moldic, common shell, gastropods, bivalves, rare very fine phosphate. Good to very good moldic porosity and permeability.
420-430	10	LIMESTONE AND CLAY - yellowish gray (5Y 7/2), grainstone, poorly indurated to friable, fossiliferous, moldic, common shell, gastropods, bivalves, rare very fine phosphate, good to very good moldic apparent porosity and permeability. Clay - yellowish gray (7/2), soft, lumpy, rare very fine phosphate.
430-440	10	LIMESTONE AND CLAY - yellowish gray (5Y 8/1), grainstone, poorly indurated to friable, fossiliferous, moldic, common shell, gastropods, bivalves, rare very fine phosphate, good to very good moldic apparent porosity and permeability. Clay - yellowish gray (7/2), soft, lumpy, rare very fine phosphate.
440-450	10	LIMESTONE AND CLAY - yellowish gray (5Y 7/2), grainstone, poorly indurated to friable, fossiliferous, moldic, common shell, gastropods, bivalves, rare very fine phosphate, good to very good moldic apparent porosity and permeability. Clay - yellowish gray (5Y 5/2), soft, lumpy, rare very fine phosphate.
450-460	10	LIMESTONE - yellowish gray (5Y 7/2), grainstone, poorly indurated to friable, fossiliferous, moldic, common shell, gastropods, bivalves, fine phosphate, good to very good moldic apparent porosity and permeability.

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460-470	10	CLAY AND LIMESTONE - pale olive (10Y 6/2), soft, lumpy, fine phosphate. Limestone - yellowish gray (5Y 7/2), grainstone, poorly indurated to friable, fossiliferous, common shell, gastropods, bivalves, fine phosphate, fair to good apparent porosity and permeability.
470-480	10	CLAY - pale olive (10Y 6/2), soft, lumpy, dry, occasional fine phosphate.
480-490	10	CLAY - pale olive (10Y 6/2), soft, lumpy, dry, common fine-grained phosphate.
490-500	10	CLAY - grayish olive (10Y 4/2), soft, lumpy, sticky, very common fine-grained phosphate.
500-510	10	CLAY AND LIMESTONE - pale olive (10Y 6/2), soft, lumpy, fine phosphate. Limestone - yellowish gray (5Y 7/2), grainstone, poorly indurated to friable, fossiliferous, common shell, bivalves, fine phosphate, fair to good apparent porosity and permeability.
510-520	10	CLAY - grayish olive (10Y 4/2), soft, lumpy, sticky, very common fine-grained phosphate.
520-530	10	CLAY AND LIMESTONE - yellowish gray (5Y 7/2), soft, lumpy, fine phosphate. Limestone - yellowish gray (5Y 7/2), grainstone, poorly indurated, fossiliferous, common shell, fine phosphate, fair to good apparent porosity and permeability.
530-550	20	CLAY AND LIMESTONE - pale olive (10Y 6/2), soft, lumpy, fine phosphate. Limestone - yellowish gray (5Y 7/2), grainstone, poorly indurated to friable, fossiliferous, common shell, bivalves, fine phosphate, fair to good apparent porosity and permeability.
550-560	10	CLAY - yellowish gray (5Y 7/2), soft, sticky, fine-grained phosphate.
560-580	20	CLAY - pale olive (10Y 6/2), soft, sticky, rare fine-grained phosphate.
580-590	10	CLAY - greenish black (5GY 2/1), soft, sticky, dense, rare fine-grained phosphate.
590-600	10	CLAY AND LIMESTONE - pale olive (10Y 6/2), soft, lumpy, fine phosphate. Limestone - yellowish gray (5Y 7/2), grainstone, poorly indurated to friable, fossiliferous, common shell, bivalves, fine phosphate, fair to good apparent porosity and permeability.
600-610	10	CLAY AND LIMESTONE - pale olive (10Y 6/2), soft lumpy, fine phosphate. Limestone - yellowish gray (5Y 7/2), grainstone, slightly sandy, very fine-grained phosphate, mollusks, fair apparent porosity and permeability.
610-620	10	LIMESTONE AND CLAY - yellowish gray (5Y 7/2), grainstone, slightly sandy to sandy, moderately soft, rare very fine grained phosphate, fair apparent porosity and permeability. Clay - yellowish gray (5Y 7/2), soft, lumpy, very fine-grained phosphate.

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620-630	10	LIMESTONE - yellowish gray (5Y 7/2), grainstone, sandy, moderately hard, very fine grained phosphate, mollusks, echinoids, fair apparent porosity and permeability.
630-640	10	LIMESTONE - yellowish gray (5Y 7/2), grainstone, sandy, quartz, sub-rounded, moderately hard, very fine-grained phosphate, echinoids, fair apparent porosity and permeability.
640-650	10	LIMESTONE - yellowish gray (5Y 7/2), packstone/grainstone, moderately indurated to friable, finely phosphatic, fossiliferous, common shell fragments, mollusks, gastropods, fair to good apparent porosity and permeability.
650-660	10	LIMESTONE - yellowish gray (5Y 7/2), grainstone, moderately indurated to friable, finely phosphatic, common shell fragments, fair to good apparent porosity and permeability.
660-680	20	LIMESTONE - yellowish gray (5Y 8/1) to yellowish gray (5Y 7/2), wackestone, coarse-grained, well indurated, fossiliferous, moldic, gastropods, bivalves, minor very fine phosphate, good apparent porosity and permeability
680-690	10	LIMESTONE - yellowish gray (5Y 8/1), packstone to wackestone, coarse-grained, moderately to well indurated, fossiliferous, moldic, gastropods, bivalves, minor very fine phosphate, good apparent porosity and permeability
690-710	20	LIMESTONE - yellowish gray (5Y 8/1) to light gray (N7), packstone to wackestone, coarse-grained, moderately to well indurated, fossiliferous, moldic, gastropods, bivalves, fair apparent porosity and permeability
710-720	10	DOLOSTONE AND MARL - olive gray (5Y 4/1), crystalline, coarse-grained, moderately to well indurated, poor apparent porosity and permeability. Marl - yellowish gray (5Y 8/1), gritty, moderately consolidated
720-730	10	LIMESTONE AND DOLOSTONE AND MARL - yellowish gray (5Y 8/1) to light gray (N7), packstone to wackestone, coarse-grained, moderately to very well indurated, fossiliferous, moldic, gastropods, bivalves, fair to good apparent porosity and permeability. Dolostone - pale yellowish brown (10YR 6/2), crystalline, fine-grained, moderately to well indurated, minor pinpoint vugs, poor apparent porosity and permeability. Marl - yellowish gray (5Y 8/1), gritty, moderately consolidated.
730-740	10	LIMESTONE AND MARL - yellowish gray (5Y 8/1), grainstone to packstone, medium to coarse-grained, moderately indurated, fossiliferous, fair to good apparent porosity and permeability, Marl - yellowish gray (5Y 8/1) to very light gray (N8), gritty, moderately consolidated.

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740-750	10	MARL AND LIMESTONE - yellowish gray (5Y 8/1) to very light gray (N8), gritty, moderately consolidated. Limestone - yellowish gray (5Y 7/2), packstone, medium-grained, moderately to well indurated, fossiliferous, fair apparent porosity and permeability
750-760	10	LIMESTONE - yellowish gray (5Y 8/1), grainstone to packstone, medium to coarse-grained, poorly to moderately indurated, fossiliferous, fair to good apparent porosity and permeability
760-770	10	LIMESTONE - yellowish gray (5Y 8/1) to very pale orange (10YR 8/2), grainstone to packstone, medium to coarse-grained, poorly to well indurated, fossiliferous, fair to good apparent porosity and permeability
770-780	10	LIMESTONE - yellowish gray (5Y 8/1) packstone, fine to medium-grained, poorly to moderately indurated, fair to good apparent porosity and permeability
780-790	10	LIMESTONE - very pale orange (10YR 8/2), grainstone to packstone, fine to medium-grained, poorly to moderately indurated, fossiliferous, fair to good apparent porosity and permeability.
790-800	10	LIMESTONE - very pale orange (10YR 8/2) to yellowish gray (5Y 7/2), grainstone to packstone, fine to medium-grained, poorly to moderately indurated, fossiliferous, fair apparent porosity and permeability.
800-810	10	MARL AND LIMESTONE - yellowish gray (5Y 8/1) to very light gray (N8), gritty, moderately consolidated. Limestone - yellowish gray (5Y 7/2), packstone to wackestone, fine to medium-grained, moderately to well indurated, fossiliferous, moldic, bivalves, fair apparent porosity and permeability.
810-820	10	LIMESTONE - very pale orange (10YR 8/2), grainstone to packstone, fine to medium-grained, poorly to moderately indurated, fossiliferous good apparent porosity and permeability.
820-830	10	LIMESTONE - very pale orange (10YR 8/2) to yellowish gray (5Y 8/1), grainstone to packstone, fine to medium-grained, poorly to moderately indurated, fossiliferous, good apparent porosity and permeability.
830-860	30	LIMESTONE - yellowish gray (5Y 8/1), grainstone to packstone, medium-grained, poorly to moderately indurated, fossiliferous, minor molds/castes, good apparent porosity and permeability.
860-870	10	LIMESTONE - very pale orange (10YR 8/2) to yellowish gray (5Y 7/2), packstone, fine to medium-grained, poorly to well indurated, partially dolomitized, fair apparent porosity and permeability.

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870-880	10	LIMESTONE - very pale orange (10YR 8/2) to yellowish gray (5Y 7/2), mudstone to packstone, fine to medium-grained, poorly to well indurated, partially dolomitized, poor apparent porosity and permeability.
880-890	10	LIMESTONE - yellowish gray (5Y 7/2), packstone to wackestone, medium to coarse-grained, poorly to well indurated, fair apparent porosity and permeability.
890-900	10	LIMESTONE - yellowish gray (5Y 7/2), packstone, fine to medium-grained, poorly to moderately indurated, fair apparent porosity and permeability, rare Lignite, black (N1) friable.
900-910	10	LIMESTONE - yellowish gray (5Y 7/2), packstone, fine to medium-grained, poorly to moderately indurated, fair apparent porosity and permeability, Limestone - moderate yellowish brown (10YR 5/4), grainstone, medium-grained, poorly to moderately indurated, dolomitized, good apparent porosity and permeability. Limestone - moderate yellowish brown (10YR 5/4), Mudstone, fissile, finely laminated, poor apparent porosity and permeability.
910-920	10	LIMESTONE - pale yellowish brown (10YR 6/2) to moderate yellowish brown (10YR 5/4), grainstone, medium-grained, poorly indurated, good apparent porosity and permeability, rare lignite, black (N1) friable.
920-930	10	LIMESTONE - yellowish gray (5Y 7/2), grainstone, medium-grained, poorly indurated, good apparent porosity and permeability
930-940	10	LIMESTONE - yellowish gray (5Y 7/2), grainstone, fine to medium-grained, poorly indurated, trace fine phosphate, good apparent porosity and permeability.
940-950	10	LIMESTONE - yellowish gray (5Y 7/2), grainstone, coarse to medium-grained, poorly indurated, good apparent porosity and permeability, trace Lignite, black (N1) friable.
950-960	10	LIMESTONE - yellowish gray (5Y 7/2), grainstone, coarse to medium-grained, friable to poorly indurated, wackestone, yellowish gray (5YR 8/1), well indurated, fine grained, moldic good apparent porosity and permeability.
960-970	10	LIMESTONE - yellowish gray (5Y 7/2), grainstone, very coarse-grained, friable to poorly indurated, good apparent porosity and permeability, trace lignite, black (N1) friable.
970-980	10	LIMESTONE AND MARL - yellowish gray (5Y 8/1), grainstone, very coarse-grained, friable to poorly indurated, good apparent porosity and permeability, trace fine phosphate. Marl - very light gray (N8), very low permeability, soft.

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980-990	10	LIMESTONE AND CLAY - yellowish gray (5Y 8/1), grainstone, very coarse-grained, friable to poorly indurated, trace fine phosphate, good apparent porosity and permeability. Clay - yellowish gray (5Y 7/2), good apparent permeability, soft.
990-1000	10	LIMESTONE, MARL AND CLAY - yellowish gray (5Y 8/1), grainstone to packstone, very coarse to medium-grained, friable to moderately indurated, good apparent porosity and permeability. Marl - very light gray (N8), very low permeability. Clay - yellowish gray (5Y 7/2), good apparent permeability, soft.
1000-1010	10	LIMESTONE - yellowish gray (5Y 7/2), grainstone, coarse grained, friable, good apparent porosity and permeability. Limestone, yellowish gray (5Y 8/1), packstone, coarse to medium grained, well to moderately indurated, fair porosity and permeability.
1010-1020	10	LIMESTONE - yellowish gray (5Y 7/2), grainstone, coarse grained, friable, good apparent porosity and permeability, Limestone - yellowish gray (5Y 8/1), packstone, coarse to medium grained, well to moderately indurated, occasional bivalves, good apparent porosity and permeability.
1020-1030	10	CLAY AND LIMESTONE - yellowish gray (5Y 7/2), good apparent permeability, sticky, soft. Limestone - yellowish gray (5Y 7/2), packstone, medium grained, occasional fine phosphate, fair apparent porosity and permeability.
1030-1040	10	CLAY AND LIMESTONE - yellowish gray (5Y 7/2), good apparent permeability, sticky, soft, occasional fine phosphate. Limestone - yellowish gray (5Y 7/2), grainstone, medium grained, friable, good apparent porosity and permeability.
1040-1050	10	LIMESTONE - very light gray (N8), grainstone, coarse-grained, friable, good apparent porosity and permeability. Limestone - very light gray (N8), packstone, poorly indurated, occasional fine phosphate, fair apparent porosity and permeability.
1050-1060	10	LIMESTONE - yellowish gray (5Y 8/1) to very light gray (N8), grainstone, medium- grained, friable, occasional fine phosphate, good apparent porosity and permeability. Limestone - yellowish gray (5Y 8/1), packstone, poorly indurated, fair apparent porosity and permeability.
1060-1070	10	LIMESTONE - yellowish gray (5Y 8/1) to very light gray (N8), grainstone, medium to fine-grained, friable, occasional fine phosphate, good apparent porosity and permeability.
1070-1080	10	LIMESTONE AND CLAY - yellowish gray (5Y 8/1) to very light gray (N8), grainstone, medium to coarse-grained, friable, good apparent porosity and permeability. Clay - yellowish gray (5Y 8/1), sticky, soft, occasional fine phosphate.

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1080-1090	10	CLAY - yellowish gray (5Y 8/1), sticky, soft, good apparent permeability, occasional fine phosphate.
1090-1100	10	CLAY - yellowish gray (5Y 8/1), gritty, sticky, fair apparent permeability, occasional fine phosphate.
1100-1110	10	LIMESTONE - yellowish gray (5Y 7/2), grainstone, medium to coarse grained, friable to poorly indurated, minor fine phosphate, good apparent porosity and permeability.
1110-1120	10	LIMESTONE - yellowish gray (5Y 7/2), grainstone, coarse grained, friable to moderately indurated, trace fine phosphate, good apparent porosity and permeability.
1120-1130	10	LIMESTONE - yellowish gray (5Y 7/2), grainstone, medium to coarse grained, friable to poorly indurated, rare fine phosphate, good apparent porosity and permeability.
1130-1140	10	LIMESTONE - yellowish gray (5Y 7/2), grainstone, medium to coarse grained, friable, rare fine phosphate, good apparent porosity and permeability.
1140-1150	10	LIMESTONE - yellowish gray (5Y 7/2), grainstone, coarse grained, friable to poorly indurated, rare fine phosphate, good apparent porosity and permeability.
1150-1160	10	LIMESTONE - yellowish gray (5Y 8/1) to (5Y 7/2), grainstone, medium to coarse grained, friable to moderately indurated, occasional fine phosphate, good to fair apparent porosity and permeability.
1160-1170	10	LIMESTONE - yellowish gray (5Y 8/1) to (5Y 7/2), grainstone to packstone, coarse grained, friable to moderately indurated, occasional fine phosphate, good to fair apparent porosity and permeability.
1170-1180	10	LIMESTONE - yellowish gray (5Y 7/2), grainstone, coarse grained, friable to moderately indurated, trace fine phosphate, good apparent porosity and permeability.
1180-1190	10	LIMESTONE - yellowish gray (5Y 7/2), grainstone, coarse to medium grained, friable to moderately indurated, minor fine phosphate, good apparent porosity and permeability.
1190-1200	10	LIMESTONE - yellowish gray (5Y 8/1) to (5Y 7/2), grainstone, coarse to medium grained, friable to moderately indurated, minor fine phosphate, trace shell/coral fragments, fair to good apparent porosity and permeability.
1200-1220	20	LIMESTONE - yellowish gray (5Y 8/1) to (5Y 7/2), grainstone, coarse to medium grained, friable to moderately indurated, minor fine phosphate, trace shell/coral fragments, good apparent porosity and permeability.

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1220-1230	10	LIMESTONE - yellowish gray (5Y 8/1) to (5Y 7/2), grainstone, coarse to medium grained, friable to moderately indurated, minor fine phosphate, common coral fragments, good apparent porosity and permeability.
1230-1240	10	LIMESTONE - yellowish gray (5Y 8/1), grainstone/packstone, coarse to medium grained, moderately to well indurated, minor fine phosphate, moldic, trace spar, good apparent porosity and permeability.
1240-1250	10	LIMEMUD - very light gray (N8), soft, lumpy
1250-1260	10	LIMESTONE - yellowish gray (5Y 8/1) to (5Y 7/2), grainstone, coarse to medium grained, friable to moderately indurated, minor fine phosphate, occasional coral fragments, good apparent porosity and permeability.
1260-1280	20	LIMESTONE - yellowish gray (5Y 8/1) to (5Y 7/2), grainstone, coarse to medium grained, moderately indurated, minor fine phosphate, fair to good apparent porosity and permeability.
1280-1290	10	LIMESTONE - very pale orange (10YR 8/2), grainstone, fine to medium grained, moderately indurated, rare fine phosphate, good apparent porosity and permeability.
1290-1300	10	LIMESTONE - very pale orange (10YR 8/2), grainstone, fine to medium grained, moderately indurated, rare fine phosphate, pelloidal, good apparent porosity and permeability.
1300-1310	10	LIMESTONE - very pale orange (10YR 8/2) to yellowish gray (5Y 8/1), grainstone, fine to medium grained, moderately indurated, rare fine phosphate, fair to good apparent porosity and permeability.
1310-1320	10	LIMESTONE - yellowish gray (5Y 8/1), grainstone, coarse to medium grained, moderately indurated, rare fine phosphate, fair to good apparent porosity and permeability.
1320-1350	30	LIMESTONE - very pale orange (10YR 8/2) to yellowish gray (5Y 8/1), grainstone, coarse to medium grained, moderately indurated, rare fine phosphate, echinoids, good apparent porosity and permeability.
1350-1360	10	LIMESTONE - very pale orange (10YR 8/2), grainstone, fine to medium grained, friable, poor to moderately indurated, rare fine phosphate, minor casts, rare spar, good apparent intergranular porosity and permeability.
1360-1370	10	LIMESTONE - very pale orange (10YR 8/2), grainstone, fine to medium grained, friable, poor to moderately indurated, rare fine phosphate, rare casts, good apparent intergranular porosity and permeability

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1370-1380	10	LIMESTONE - very pale orange (10YR 8/2), grainstone, fine to medium grained, friable, poor to moderately indurated, rare fine phosphate, minor casts, rare spar, good apparent intergranular porosity and permeability.
1380-1390	10	LIMESTONE - very pale orange (10YR 8/2), grainstone, fine to medium grained, friable, poor to moderately indurated, rare fine phosphate, rare casts, good apparent intergranular porosity and permeability.
1390-1400	10	LIMESTONE - very pale orange (10YR 8/2), grainstone, fine to medium grained, friable to moderately indurated, rare fine phosphate, poor to fair apparent intergranular porosity and permeability.
1400-1410	10	DOLOSTONE AND LIMESTONE - moderate yellowish brown (10YR 5/4), crystalline, fine to medium-grained, moderate to well indurated, poor apparent porosity and permeability. Limestone - very pale orange (10YR 8/2), grainstone, fine to medium grained, friable to moderately indurated, minor molds/castes, poor to fair apparent intergranular porosity and permeability.
1410-1420	10	DOLOSTONE - moderate yellowish brown (10YR 5/4) to dark yellowish brown (10YR 4/2), crystalline, medium-grained, moderately to well indurated, common pinpoint vugs, poor apparent porosity and permeability.
1420-1430	10	DOLOSTONE AND LIMESTONE - moderate yellowish brown (10YR 5/4) to dark yellowish brown (10YR 4/2), crystalline, medium-grained, moderately to well indurated, common pinpoint vugs, poor apparent porosity and permeability. Limestone - very pale orange (10YR 8/2) to grayish orange (10YR 7/4), grainstone, fine to medium grained, friable to moderately indurated, variably dolomitized, fair apparent intergranular porosity and permeability.
1430-1440	10	DOLOSTONE AND DOLOMITIC LIMESTONE - moderate yellowish brown (10YR 5/4) to dark yellowish brown (10YR 4/2), crystalline, medium to coarse grained, moderately indurated, abundant pinpoint vugs, fair apparent porosity and permeability. Dolomitic Limestone - very pale orange (10YR 8/2) to grayish orange (10YR 7/4), grainstone, fine to medium grained, friable to moderately indurated, fair apparent intergranular porosity and permeability.
1440-1450	10	DOLOSTONE AND LIMESTONE - moderate yellowish brown (10YR 5/4), crystalline, fine to medium-grained, moderately to well indurated, poor apparent porosity and permeability. Limestone - very pale orange (10YR 8/2), grainstone, fine to medium grained, friable to moderately indurated, minor molds/castes, poor to fair apparent porosity and permeability.

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1450-1460	10	DOLOSTONE AND LIMESTONE - moderate yellowish brown (10YR 5/4), crystalline, fine to medium-grained, moderately to well indurated, poor apparent porosity and permeability. Limestone - very pale orange (10YR 8/2), grainstone, fine to medium grained, friable to moderately indurated, poor to fair apparent intergranular porosity
1460-1470	10	DOLOSTONE - moderate yellowish brown (10YR 5/4), crystalline, fine to medium-grained, moderately to well indurated, poor apparent porosity and permeability.
1470-1480	10	LIMESTONE - yellowish gray (5Y 8/1) to light gray (N7), packstone, mottled, medium to coarse grained, friable to moderately indurated, dolomitic, fair to good apparent intergranular porosity and permeability.
1480-1490	10	LIMESTONE - very pale orange (10YR 8/2), grainstone, fine to medium grained, friable, poor to moderately indurated, rare fine phosphate, fair apparent intergranular porosity and permeability.
1490-1500	10	LIMESTONE - yellowish gray (5Y 8/1), grainstone, fine to medium grained, friable, poor to moderately indurated, rare fine phosphate, minor casts, rare spar, fair to good apparent intergranular porosity and permeability.
1500-1510	10	LIMESTONE - very pale orange (10YR 8/2), grainstone, fine to medium grained, sandy, friable, poor to moderately indurated, minor casts, fair to good apparent intergranular porosity and permeability.
1510-1520	10	LIMESTONE - very pale orange (10YR 8/2) to grayish orange (10YR 7/4), grainstone, fine to medium grained, silty, friable, poor to moderately indurated, fair to good apparent intergranular porosity and permeability.
1520-1530	10	LIMESTONE - yellowish gray (5Y 8/1), grainstone, fine to medium grained, silty, friable, poor to moderately indurated, rare spar, rare casts, fair to good apparent intergranular porosity and permeability.
1530-1540	10	LIMESTONE - very pale orange (10YR 8/2) to yellowish gray (5Y 8/1), grainstone, fine to medium grained, silty, friable, poor to moderately indurated, fair to good apparent intergranular porosity and permeability.

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1540-1550	10	LIMESTONE AND DOLOSTONE - very pale orange (10YR 8/2) to grayish orange (10YR 7/4), grainstone, fine to medium grained, silty, minor very fine phosphate, rare shell fragments, friable, poor to moderately indurated, fair to good apparent intergranular porosity and permeability. Dolostone - moderate yellowish brown (10YR 5/4), microcrystalline, fine-grained, well indurated, poor apparent porosity and permeability.
1550-1560	10	LIMESTONE AND RECRYSTALLIZED LIMESTONE - very pale orange (10YR 8/2) to grayish orange (10YR 7/4), grainstone, fine to medium grained, silty, minor very fine phosphate, rare shell fragments, friable, poor to moderately indurated, fair to good apparent intergranular porosity and permeability. Recrystallized limestone, very pale orange (10YR 8/2), moldic, abundant fossils, well indurated, very good moldic porosity and permeability.
1560-1580	20	LIMESTONE - very pale orange (10YR 8/2) to grayish orange (10YR 7/4), grainstone, fine to medium grained, silty, rare shell fragments, friable, poor to moderately indurated, fair to good apparent intergranular porosity and permeability.
1580-1590	10	LIMESTONE - grayish orange (10YR 7/4) to very pale orange (10YR 8/2), grainstone, fine grained, dolomitic, common fossils, friable to moderately indurated, fair to poor apparent intergranular porosity and permeability.
1590-1600	10	DOLOMITIC LIMESTONE - moderate yellowish brown (10YR 5/4), crystalline, grainstone, fine grained, rare fossils, friable, poor to moderately indurated, poor to fair porosity and permeability.
1600-1610	10	LIMESTONE - moderate yellowish brown (10YR 5/4) to light olive brown (5Y 5/6), wackestone, dolomitic, fine to medium grained, moderately indurated, fossiliferous (forams: <u>Nummulites vanderstoki</u>), rare calcareous clay, poor apparent porosity and/permeability.
1610-1620	10	LIMESTONE - moderate yellowish brown (10YR 5/4) to yellowish gray (5Y 7/2), wackestone and mudstone, variably dolomitic, fine to medium grained, moderately to poorly indurated, fossiliferous (forams: <u>Nummulites vanderstoki</u>), rare calcareous clay, poor apparent porosity and/permeability.
1620-1630	10	LIMESTONE - yellowish gray (5Y 7/2), wackestone and mudstone, variably dolomitic, fine to medium grained, moderately to moderately well indurated, fossiliferous, minor firm to stiff calcareous clay, poor apparent porosity and permeability.
1630-1640	10	LIMESTONE - yellowish gray (5Y 7/2), mudstone, moderate to poor induration, poor apparent porosity and permeability.

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1640-1649	9	LIMESTONE AND DOLOSTONE - yellowish gray (5Y 7/2), mudstone, variably indurated, poor apparent porosity and permeability. Dolostone, moderate olive brown (5Y 4/4), coarsely crystalline, vuggy, good apparent porosity and permeability.
1649-1660	11	DOLOSTONE AND LIMESTONE - moderate olive brown (5Y 4/4), coarsely crystalline, moderately to well indurated, vuggy, good to fair apparent porosity and permeability. Limestone - yellowish gray (5Y 7/2), Mudstone, variably indurated, poor apparent porosity and permeability.
1660-1670	10	LIMESTONE AND DOLOSTONE - yellowish gray (5Y 7/2), fossil packstone, moderately to poorly indurated, foraminiferous: <u>Nummulites vanderstoki</u> , poor apparent porosity and permeability. Dolostone - moderate olive brown (5Y 4/4), coarsely crystalline, well indurated, vuggy, fair apparent porosity and permeability.
1670-1680	10	LIMESTONE AND DOLOSTONE - yellowish gray (5Y 7/2), fossil packstone, moderately to poorly indurated, foraminiferous: <u>Nummulites vanderstoki</u> , poor porosity/permeability. Dolostone - moderate olive brown (5Y 4/4) to olive gray (5Y 3/2), microcrystalline, well indurated, variably vuggy, fair to poor vuggy apparent porosity and permeability.
1680-1690	10	LIMESTONE - yellowish gray (5Y 7/2), fossil packstone, moderately to poorly indurated, foraminiferous: <u>Nummulites vanderstoki</u> , minor mudstone fragments, poor apparent porosity and permeability.
1690-1700	10	LIMESTONE AND DOLOSTONE - -yellowish gray (5Y 7/2), fossil grainstone, moderately to poorly indurated, dolomitic, foraminiferous (<u>Nummulites vanderstoki</u>), poor apparent porosity and permeability. Dolostone - moderate olive brown (5Y 4/4), coarsely crystalline, well indurated, vuggy, good to fair vuggy porosity, good to fair apparent porosity and permeability.
1700-1710	10	DOLOSTONE - dusky yellow (5Y 6/4), coarsely crystalline, moderately to poorly indurated, vuggy (pinpoint), fair vuggy porosity and permeability.
1710-1720	10	DOLOSTONE - dusky yellow (5Y 6/4), coarsely to finely crystalline, moderately well indurated to poorly indurated, vuggy (pinpoint), good to fair apparent vuggy porosity and permeability.
1720-1731	11	DOLOSTONE - dusky yellow (5Y 6/4), coarsely crystalline, moderately to poorly indurated, vuggy (pinpoint), fair apparent vuggy porosity and permeability.
1731-1740	9	DOLOSTONE - moderate olive brown (5Y 4/4), microcrystalline, saccharoidal texture, well indurated, hard, sparsely vuggy (pinpoint), poor apparent vuggy porosity and permeability.

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1740-1750	10	DOLOSTONE - moderate olive brown (5Y 4/4) to olive gray (5Y 3/2), microcrystalline, saccharoidal texture, well indurated, hard, rare pinpoint vugs. poor apparent porosity and permeability.
1750-1760	10	DOLOSTONE - moderate olive brown (5Y 4/4) to olive gray (5Y 3/2), microcrystalline, saccharoidal texture, well indurated, hard, rare pinpoint vugs, poor apparent porosity and permeability. Dolostone - moderate olive brown (5Y 4/4), coarsely crystalline, moderately well indurated, variably vuggy, good to fair vuggy porosity, fair apparent porosity and permeability.
1760-1770	10	DOLOSTONE - moderate olive brown (5Y 4/4), microcrystalline, saccharoidal texture, well indurated, hard, sparsely vuggy (pinpoint), poor apparent porosity and permeability.
1770-1780	10	DOLOSTONE - moderate olive brown (5Y 4/4), microcrystalline, saccharoidal texture, well indurated, hard, sparsely vuggy (pinpoint), poor apparent porosity and permeability.
1780-1790	10	DOLOSTONE - moderate olive brown (5Y 4/4), microcrystalline, saccharoidal texture, well indurated, hard, sparsely vuggy (pinpoint), poor apparent porosity and permeability.
1790-1800	10	DOLOSTONE - moderate olive brown (5Y 4/4) to olive gray (5Y 3/2), microcrystalline, saccharoidal texture, well indurated, hard, sparsely vuggy (pinpoint), rare fossil castes: <u>Miliolid alveolinella</u> poor apparent porosity and permeability.
1800-1820	20	DOLOSTONE - moderate olive brown (5Y 4/4) to olive gray (5Y 3/2), microcrystalline, saccharoidal texture, well indurated, hard, sparsely vuggy (pinpoint), poor apparent porosity and permeability.
1820-1830	10	DOLOSTONE - moderate olive brown (5Y 4/4), microcrystalline, saccharoidal texture, well indurated, hard, sparsely vuggy (pinpoint), poor apparent porosity and permeability.
1830-1840	10	DOLOSTONE - light olive gray (5Y 5/2) to olive gray (5Y 3/2), coarsely crystalline to microcrystalline, saccharoidal texture, well indurated, hard, sparsely vuggy (pinpoint), poor apparent porosity and permeability.
1840-1850	10	DOLOSTONE - olive gray (5Y 3/2), microcrystalline, saccharoidal texture, well indurated, hard, sparsely vuggy (pinpoint), poor apparent porosity and permeability.
1850-1860	10	DOLOSTONE - olive gray (5Y 3/2), coarsely crystalline to microcrystalline, saccharoidal texture, well indurated, hard, sparsely vuggy (pinpoint), poor apparent porosity and permeability.
1860-1880	20	DOLOSTONE - olive gray (5Y 3/2), microcrystalline, saccharoidal texture, well indurated, hard, sparsely vuggy (pinpoint), poor apparent porosity and permeability.

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1880-1890	10	DOLOSTONE - olive gray (5Y 3/2) to moderate olive brown (5Y 4/4), microcrystalline, sacchoroidal texture, well indurated, hard, massive, sparsely vuggy (pinpoint), poor apparent porosity and permeability.
1890-1900	10	DOLOSTONE - moderate olive brown (5Y 4/4), sacchoroidal texture, well indurated, hard, massive, sparsely vuggy (pinpoint), poor to good apparent porosity and permeability.
1900-1910	10	DOLOSTONE - moderate olive brown (5Y 4/4), coarsely crystalline to microcrystalline, sacchoroidal texture, well indurated, hard, sparsely vuggy (pinpoint), poor apparent porosity and permeability.
1910-1920	10	DOLOSTONE - moderate olive brown (5Y 4/4), microcrystalline, sacchoroidal texture, well indurated, hard, massive, sparsely vuggy (pinpoint), poor porosity/permeability. poor apparent porosity and permeability.
1920-1925	5	DOLOSTONE - moderate olive brown (5Y 4/4), microcrystalline, sacchoroidal texture, well indurated, hard, sparsely vuggy (pinpoint), poor apparent porosity and permeability.
1925-1930	5	DOLOSTONE - moderate olive brown (5Y 4/4), microcrystalline, sacchoroidal texture, well indurated, hard, massive, sparsely vuggy (pinpoint), trace lignite, black (N1), friable, poor apparent porosity and permeability.
1930-1940	10	DOLOSTONE - moderate olive brown (5Y 4/4), microcrystalline to coarsely crystalline, sacchoroidal texture, well indurated to friable, hard, massive, sparsely vuggy (pinpoint), trace lignite, black (N1), friable, trace limestone, yellowish gray (5Y 8/1), poor to good apparent porosity and permeability.
1940-1950	10	DOLOSTONE - moderate olive brown (5Y 4/4), microcrystalline, sacchoroidal texture, well indurated, hard, massive, sparsely vuggy (pinpoint), trace lignite, black (N1), friable, trace limestone, yellowish gray (5Y 8/1), poor to good apparent porosity and permeability.
1950-1960	10	DOLOSTONE - moderate olive brown (5Y 4/4), microcrystalline to coarsely crystalline, sacchoroidal texture, well indurated to poorly indurated, hard, massive, sparsely vuggy (pinpoint), poor to moderate apparent porosity and permeability.
1960-1970	10	DOLOSTONE - moderate olive brown (5Y 4/4), microcrystalline to coarsely crystalline, sacchoroidal texture, well indurated to poorly indurated, hard, massive, vuggy, good apparent porosity and permeability.
1970-1980	10	DOLOSTONE - moderate yellowish brown (10 YR 5/4), coarsely crystalline, sacchoroidal texture, friable to poorly indurated, moderate porosity, vuggy, good apparent porosity and permeability.

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1980-2010	30	DOLOSTONE - olive black (5Y 2/1), microcrystalline to coarsely crystalline, sacchoroidal texture, friable to moderately indurated. vuggy, moderate to good apparent porosity and permeability.
2010-2040	30	DOLOSTONE -olive gray (5Y 3/2), microcrystalline to coarsely crystalline, sacchoroidal texture, friable to moderately indurated. vuggy, moderate to good apparent porosity and permeability.
2040-2050	10	DOLOSTONE - moderate olive brown (5Y 4/4) to olive gray (5Y 3/2), microcrystalline to coarsely crystalline, sacchoroidal texture, friable to moderately indurated, vuggy, good to moderate apparent porosity and permeability.
2050-2060	10	DOLOSTONE AND LIMESTONE - moderate olive brown (5Y 4/4) to olive gray (5Y 3/2), microcrystalline to coarsely crystalline, sacchoroidal texture, friable to moderately indurated, vuggy, good to moderate apparent porosity and permeability.
		Limestone - yellowish gray (5Y 8/1) to yellowish gray (5Y 7/2), grainstone to wackestone, fine to coarse grained, friable to moderately indurated, minor phosphatic sand, laminations, fair apparent porosity and permeability.
2060-2070	10	DOLOSTONE AND LIMESTONE - moderate olive brown (5Y 4/4), coarsely crystalline, sacchoroidal texture, friable, vuggy, moderate apparent porosity and permeability. Limestone - yellowish gray (5Y 8/1) to yellowish gray (5Y 7/2), wackestone. fine to medium grained, friable to moderately indurated, minor phosphatic sand, poor apparent porosity and permeability.
2070-2090	20	DOLOSTONE AND LIMESTONE - moderate olive brown (5Y 4/4) to olive gray (5Y 3/2), microcrystalline to coarsely crystalline, sacchoroidal texture, friable to well indurated, vuggy, good to moderate apparent porosity and permeability. Limestone - yellowish gray (5Y 8/1) to yellowish gray (5Y 7/2), grainstone to wackestone, fine to coarse grained, poorly to moderately indurated, minor phosphatic sand, poor apparent porosity and permeability.
2090-2110	20	DOLOSTONE AND LIMESTONE - moderate olive brown (5Y 4/4), microcrystalline to coarsely crystalline, sacchoroidal texture, well indurated to friable, soft, vuggy, poor to good apparent porosity and permeability. Limestone - yellowish gray (5Y 8/1), grainstone to wackestone, fine to coarse grained, moderately indurated, minor phosphatic sand. Trace Lignite, black (N1), friable, poor to fair apparent porosity and permeability.
2110-2120	10	DOLOSTONE - dark yellowish brown (10YR 4/2) to olive gray (5Y 3/2), microcrystalline to coarsely crystalline, sacchoroidal texture, friable to moderately indurated, vuggy, good to moderate apparent porosity and permeability.

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2120-2130	10	DOLOSTONE - dark yellowish brown (10YR 4/2) to olive gray (5Y 3/2), microcrystalline to coarsely crystalline, sacchoroidal texture, friable to moderately indurated, very vuggy, good apparent porosity and permeability.
2130-2150	20	DOLOSTONE - dark yellowish brown (10YR 4/2) to olive gray (5Y 3/2), microcrystalline to coarsely crystalline, secondary crystals, sacchoroidal texture, well indurated, hard, massive, vuggy, good to moderate apparent porosity and permeability.
2150-2160	10	DOLOSTONE AND LIMESTONE - dark yellowish brown (10YR 4/2) to olive gray (5Y 3/2), microcrystalline to coarsely crystalline, secondary crystals, sacchoroidal texture, well indurated, hard, massive, vuggy, good to moderate apparent porosity and permeability. Limestone - grayish orange (10YR 7/4), packstone, fine to medium grained, poorly indurated, poor to fair apparent porosity and permeability.
2110-2120	10	DOLOSTONE - olive gray (5Y 3/2), microcrystalline to coarsely crystalline, sacchoroidal texture, friable to moderately indurated, vuggy, good to moderate apparent porosity and permeability.
2120-2130	10	DOLOSTONE -, olive gray (5Y 3/2), microcrystalline to coarsely crystalline, sacchoroidal texture, friable to moderately indurated, very vuggy, good to moderate apparent porosity and permeability.
2130-2160	30	DOLOSTONE - olive gray (5Y 3/2), microcrystalline to coarsely crystalline, secondary crystals, sacchoroidal texture, well indurated, hard, massive, vuggy, good to moderate apparent porosity and permeability.
2160-2170	10	DOLOSTONE - dark yellowish brown (10YR 4/2) to olive black (5Y 2/1), microcrystalline to coarsely crystalline, friable to very well indurated, abundant secondary crystals, massive, highly-vugular to rarely -vugular, poor to good apparent porosity and permeability.
2170-2180	10	DOLOSTONE - moderate yellowish brown (10YR 5/4) to dark yellowish brown (10YR 4/2), crystalline, medium to coarse-grained, poorly to very well indurated, abundant secondary crystals, massive, vugular to rarely -vugular, common dolomitized echinoderm molds (<i>Oligopygus phelani kier</i>), poor to good apparent porosity and permeability.

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2180-2190	10	DOLOSTONE - moderate yellowish brown (10YR 5/4) to dark yellowish brown (10YR 4/2), crystalline, fine- to coarse-grained, abundant secondary crystals, poorly to very well indurated, massive, vugular to non-vugular, rare echinoderm molds (<u>Oligopygus phelani kier</u>), poor to good apparent porosity and permeability, rare Limestone, grayish orange (10YR 7/4), packstone, fine to medium grained, poorly indurated, poor to fair apparent porosity and permeability
2190-2200	10	DOLOSTONE AND LIMESTONE - moderate yellowish brown (10YR 5/4) to dark yellowish brown (10YR 4/2), crystalline, fine- to coarse-grained. secondary crystals, moderately to very well indurated, massive. vugular to non-vugular, dolomitized echinoderm molds (<u>Oligopygus phelani kier</u>), poor to fair apparent porosity and permeability. Minor Limestone - grayish orange (10YR 7/4) to yellowish gray (5Y 7/2), packstone, fine-grained, poorly indurated, poor apparent porosity and permeability.
2200-2220	20	DOLOSTONE - moderate olive brown (5Y 4/4) to olive gray (5Y 3/2), finely crystalline, well indurated, variably vuggy (fair to poor). common secondary coarse crystal growth in and around vugs. poor apparent porosity and permeability. (NOTE: Interval from 2200 – 2210 was cored earlier.)
2220-2230	10	DOLOSTONE - moderate yellowish brown (10YR 5/4) to dark yellowish brown (10YR 4/2), finely crystalline, well indurated, variably vuggy, common secondary coarse crystal growth, poor apparent porosity and permeability.
2230-2240	10	DOLOSTONE - moderate yellowish brown (10YR 5/4) to dark yellowish brown (10YR 4/2), finely crystalline, well indurated, variably vuggy, abundant secondary coarse crystal growth, poor apparent porosity and permeability.
2240-2250	10	DOLOSTONE AND LIMESTONE - dark yellowish brown (10YR 4/2), microcrystalline, well indurated, variably vuggy, abundant secondary coarse crystal growth, poor apparent porosity and permeability. Limestone - very pale orange (10YR 8/2) to grayish orange (10YR 7/4), packstone/grainstone, poorly indurated, friable, interbedded coarse dolomite crystals, Common foraminifera (<u>Dictyoconus americanus</u>), poor to fair intergranular porosity and permeability.
2250-2270	20	DOLOSTONE - moderate yellowish brown (10YR 5/4) to dusky yellowish brown (10YR 2/2), finely to coarsely crystalline, well indurated, variably vuggy, abundant secondary coarse crystal growth, poor apparent porosity and permeability.

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2270-2290	20	DOLOSTONE - moderate yellowish brown (10YR 5/4) to dark yellowish brown (10YR 4/2) to dark gray (N2), microcrystalline to finely crystalline, well indurated, variably vuggy, common secondary coarse crystal growth, poor apparent porosity and permeability.
2290-2310	20	DOLOSTONE - moderate yellowish brown (10YR 5/4) to dark yellowish brown (10YR 4/2) to dark gray (N2), microcrystalline to finely crystalline, well indurated, variably vuggy, common secondary coarse crystal growth, rare marl, poor apparent porosity and permeability.
2310-2330	20	DOLOSTONE - moderate yellowish brown (10YR 5/4) to dark yellowish brown (10YR 4/2) to dark gray (N2), microcrystalline to finely crystalline, well indurated, variably vuggy, common secondary coarse crystal growth, poor to fair apparent porosity and permeability.
2330-2350	20	DOLOSTONE - dusky yellowish brown (10YR 2/2), microcrystalline to finely crystalline, well indurated, common small vugs, rare secondary coarse crystal growth, rare marl, poor apparent porosity and permeability.
2350-2360	10	DOLOSTONE - moderate yellowish brown (10YR 5/4), finely to coarsely crystalline, well indurated, common secondary crystal growth, poor to fair apparent porosity and permeability.
2360-2370	10	DOLOSTONE - moderate yellowish brown (10YR 5/4) to dark yellowish brown (10YR 4/2) to black N1), crystalline, fine- to medium-grained, well indurated, vugular, common cavities, abundant secondary coarse crystal growth (friable to moderately indurated), fair to good apparent porosity and permeability.
2370-2380	10	DOLOSTONE - moderate yellowish brown (10YR 5/4) to dark yellowish brown (10YR 4/2) to black N1), crystalline, fine- to medium-grained, well indurated, vugular, common cavities, abundant secondary coarse crystal growth, rare lignite, black (N1), friable, fair to good apparent porosity and permeability.
2380-2390	10	DOLOSTONE - moderate yellowish brown (10YR 5/4) to dark yellowish brown (10YR 4/2) to black (N1), microcrystalline to fine-grained, well to very well indurated, vugular, common cavities, abundant secondary coarse crystal growth, fair to good apparent porosity and permeability.

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2390-2400	10	DOLOSTONE - moderate yellowish brown (10YR 5/4) to dark yellowish brown (10YR 4/2) to black (N1), microcrystalline to medium-grained, well to very well indurated, vugular, common cavities, abundant secondary coarse crystal growth. rare lignite, rare relict Limestone, yellowish gray (5Y 7/2), in vugs, fair to good apparent porosity and permeability.
2400-2410	10	DOLOSTONE - moderate yellowish brown (10YR 5/4) to dark yellowish brown (10YR 4/2) to black (N1), crystalline fine- to medium-grained, well to very well indurated, vugular, common cavities, common secondary coarse crystal, rare Lignite, rare relict Limestone, yellowish gray (5Y 7/2), in vugs, fair to good apparent porosity and permeability.
2410-2430	20	DOLOSTONE - moderate yellowish brown (10YR 5/4) to dark yellowish brown (10YR 4/2) to black (N1), microcrystalline to medium-grained, well to very well indurated, vugular, common cavities, abundant secondary coarse crystal, rare relict Limestone, yellowish gray (5Y 7/2), in vugs, fair to good apparent porosity and permeability.
2430-2450	20	DOLOSTONE - olive gray (5Y 3/2), finely crystalline to coarse-grained, variably saccharoidal, well indurated, variably vuggy, fair to poor apparent porosity and permeability.
2450-2460	10	DOLOSTONE - olive gray (5Y 3/2), finely crystalline to coarse-grained, variably saccharoidal, well indurated, variably vuggy, fair to poor apparent porosity and permeability. Dolostone - dark yellowish brown (10YR 4/2), medium to coarsely crystalline, well indurated, vugular, secondary coarse crystal growth common in and around vug openings, good vuggy porosity, fair apparent porosity and permeability.
2460-2470	10	DOLOSTONE - moderate yellowish brown (10YR 5/4), finely crystalline to coarse-grained, well indurated, rare vugs, fair to poor porosity, poor apparent permeability. Dolostone - dark yellowish orange (10YR 6/6), microcrystalline, very well indurated, very hard, Conchoidal fracturing, occasional vugs, secondary coarse crystal growth common, poor apparent porosity and apparent permeability.

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2470-2480	10	DOLOSTONE - pale yellowish brown (10YR 6/2), microcrystalline, very well indurated, Conchoidal fracture, rare pinpoint vugs partially filled with secondary crystal growth, orange surface coating (iron oxide), poor to very poor porosity and apparent permeability. Dolostone - moderate yellowish brown (10YR 5/4) to dusky yellowish brown (10YR 2/2), finely crystalline to coarse-grained, well indurated, occasional vugs and secondary crystal growth vugs, poor to fair apparent porosity and permeability.
2480-2500	20	DOLOSTONE - moderate yellowish brown (10YR 5/4) to dark yellowish brown (10YR 4/2), microcrystalline to fine-grained, well indurated, poor apparent porosity and permeability.
2500-2520	20	DOLOSTONE - moderate yellowish brown (10YR 5/4) to dusky yellowish brown (10YR 2/2), microcrystalline to fine-grained, well indurated, poor apparent porosity and permeability.
2520-2530	10	DOLOSTONE - moderate yellowish brown (10YR 5/4) to dark yellowish brown (10YR 4/2), crystalline, fine to medium-grained, well to very well indurated, rare pinpoint vugs partially filled with secondary crystal growth, rare cavities partially filled with coarse-grained crystal growth, occasional orange surface coating (iron oxide), poor apparent porosity and permeability.
2530-2540	10	DOLOSTONE - pale yellowish brown (10YR 6/2) to dark yellowish brown (10YR 4/2), microcrystalline to coarse-grained, well to very well indurated, rare pinpoint vugs partially filled with secondary crystal growth, very poor porosity and apparent permeability. Dolostone - light olive gray (5Y 6/1) to olive black (5Y 2/1) crystalline, fine- to medium-grained, very well indurated, banded appearance due to preferential dolomitization along bedding planes, very poor apparent porosity and permeability.
2540-2550	10	DOLOSTONE - dark yellowish brown (10YR 4/2) to black (N1), crystalline, fine to medium-grained, well to very well indurated, rare pinpoint vugs partially filled with secondary crystal growth, poor apparent porosity and permeability.
2550-2560	10	DOLOSTONE - moderate yellowish brown (10YR 5/4) to black (N1), crystalline, fine to medium-grained, well to very well indurated, rare pinpoint vugs partially filled with secondary crystal growth, poor apparent porosity and permeability.
2560-2570	10	DOLOSTONE - moderate yellowish brown (10YR 5/4) to olive gray (5Y 3/2), microcrystalline, saccharoidal texture, well indurated, rare pinpoint vugs, poor apparent porosity and permeability.

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2570-2580	10	DOLOSTONE - moderate yellowish brown (10YR 5/4) to olive gray (5Y 3/2), microcrystalline, saccharoidal texture, well indurated, rare pinpoint vugs, evidence of fracture as secondary crystal growth commonly seen along surface of some angular rock fragments, poor apparent porosity and permeability.
2580-2590	10	DOLOSTONE - moderate yellowish brown (10YR 5/4) to olive gray (5Y 3/2), microcrystalline, saccharoidal texture, well indurated, variably pinpoint vuggy (2 to 5%), minor banding seen in some cuttings, poor apparent porosity and permeability.
2590-2620	30	DOLOSTONE - moderate yellowish brown (10YR 5/4) to olive gray (5Y 3/2), microcrystalline, saccharoidal texture, well indurated, variably pinpoint vuggy, secondary crystal growth in and around vug openings, poor apparent porosity and permeability.
2620-2640	20	DOLOSTONE - moderate yellowish brown (10Y 5/4) to olive gray (5Y 3/2), microcrystalline, saccharoidal texture, well indurated, variably pinpoint vuggy, secondary crystal growth in and around vug openings, poor apparent porosity and permeability. (*Note, bit dropped from 2623'-2625', possible source of sand sized grains?)
2640-2650	10	DOLOSTONE - dark yellowish orange (10YR 6/6) to olive gray (5Y 3/2), microcrystalline to coarsely crystalline, saccharoidal texture, well indurated, variably pinpoint vuggy, secondary crystal growth in and around vug openings, poor apparent porosity and permeability.
2650-2660	10	DOLOSTONE - dark yellowish brown (10YR 4/2) to dusky yellowish brown (10YR 2/2), microcrystalline, saccharoidal texture, well indurated, variably pinpoint vuggy, secondary crystal growth in and around vug openings, poor apparent porosity and permeability.
2660-2670	10	DOLOSTONE - dark yellowish brown (10YR 4/2) to dusky yellowish brown (10YR 2/2), microcrystalline, saccharoidal texture, well indurated, variably pinpoint vuggy, trace lignite, black (N1), poor apparent porosity and permeability.
2670-2710	40	DOLOSTONE - dark yellowish brown (10YR 4/2) to dusky yellowish brown (10YR 2/2), microcrystalline to coarsely crystalline, saccharoidal texture, well indurated, secondary crystal growth in and around vug openings, variably pinpoint vuggy, poor apparent porosity and permeability.
2710-2720	10	DOLOSTONE - olive gray (5Y 4/1), microcrystalline, saccharoidal texture, well indurated, variable pinpoint vuggy, poor apparent porosity and permeability.

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2720-2740	20	DOLOSTONE - dark yellowish brown (10YR 4/2) to dusky yellowish brown (10YR 2/2), microcrystalline to coarsely crystalline, saccharoidal texture, well indurated, secondary crystal growth in and around vug openings, variably pinpoint vuggy, poor apparent porosity and permeability.
2740-2750	10	LIMESTONE - light olive gray (5Y 6/1), microcrystalline, saccharoidal texture, well indurated, variable pinpoint vuggy, fine grained phosphate, poor apparent porosity and permeability.
2750-2760	10	DOLOSTONE AND LIMESTONE - dark yellowish brown (10YR 4/2) to dusky yellowish brown (10YR 2/2), microcrystalline to coarsely crystalline, saccharoidal texture, well indurated, secondary crystal growth in and around vug openings, variably pinpoint vuggy, poor apparent porosity and permeability. Limestone - light olive gray (5Y 6/1), microcrystalline, well indurated, variable pinpoint vuggy, fine-grained phosphate, poor apparent porosity and permeability.
2760-2770	10	DOLOSTONE - olive gray (5Y 4/1), microcrystalline, secondary crystals on surface, well indurated, variable pinpoint vuggy, poor apparent porosity and permeability.
2770-2790	20	DOLOSTONE - dark yellowish brown (10YR 4/2) to dusky yellowish brown (10YR 2/2), microcrystalline to coarsely crystalline, saccharoidal texture, well indurated, secondary crystal growth in and around vug openings, variably pinpoint vuggy, poor apparent porosity and permeability.
2790-2800	10	DOLOSTONE - moderate yellowish brown (10YR 5/4) to dusky yellowish brown (10YR 2/2), microcrystalline to coarsely crystalline, saccharoidal texture, well indurated, secondary crystal growth in and around vug openings, variably pinpoint vuggy, poor apparent porosity and permeability.
2800-2810	10	DOLOSTONE - pale yellowish brown (10YR 6/2) to dusky yellowish brown (10YR 2/2), microcrystalline to coarsely crystalline, saccharoidal texture, well indurated, secondary crystal growth in and around vug openings, variably pinpoint vuggy, poor apparent porosity and permeability.
2810-2820	10	DOLOSTONE - dark yellowish brown (10YR 4/2) to dusky yellowish brown (10YR 2/2), microcrystalline, saccharoidal texture, well indurated, secondary crystal growth in and around vug openings, variably pinpoint vuggy, poor apparent porosity and permeability.
2820-2830	10	DOLOSTONE - dark yellowish brown (10YR 4/2) to dusky yellowish brown (10YR 2/2), microcrystalline, saccharoidal texture, well indurated, variably pinpoint vuggy, poor apparent porosity and permeability.

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2830-2840	10	DOLOSTONE - pale yellowish brown (10YR 6/2) to dusky yellowish brown (10YR 2/2), microcrystalline, saccharoidal texture, well indurated, abundant secondary crystal growth in and around vug openings, variably pinpoint vuggy, poor apparent porosity and permeability.
2840-2850	10	DOLOSTONE - moderate yellowish brown (10YR 5/4) to dusky yellowish brown (10YR 2/2), microcrystalline, saccharoidal texture, well indurated, abundant secondary crystal growth in and around vug openings (very friable), variably pinpoint vuggy, poor apparent porosity and permeability.
2850-2860	10	DOLOSTONE - dark yellowish brown (10YR 4/2) to dusky yellowish brown (10YR 2/2), microcrystalline to coarsely crystalline, saccharoidal texture, well indurated, common secondary crystal growth in and around vug openings (very friable), variably pinpoint vuggy, poor apparent porosity and permeability.
2860-2870	10	DOLOSTONE - pale yellowish brown (10YR 6/2) to dusky yellowish brown (10YR 2/2), microcrystalline to finely crystalline, saccharoidal texture, well indurated, variably pinpoint vuggy, poor apparent porosity and permeability.
2870-2890	20	DOLOSTONE - moderate yellowish brown (10YR 5/4) to dusky yellowish brown (10YR 2/2), microcrystalline to finely crystalline, saccharoidal texture, well indurated, variably pinpoint vuggy, poor apparent porosity and permeability.
2890-2900	10	DOLOSTONE - dark yellowish brown (10YR 4/2) to dusky yellowish brown (10YR 2/2), microcrystalline to coarsely crystalline, saccharoidal texture, well indurated, common secondary crystal growth in and around vug openings (very friable), variably pinpoint vuggy, poor apparent porosity and permeability.
2900-2930	30	DOLOSTONE - moderate yellowish brown (10YR 5/4) to dusky yellowish brown (10YR 2/2), microcrystalline, saccharoidal texture, well indurated, moderate secondary crystal growth in and around vug openings (very friable), variably pinpoint vuggy, poor apparent porosity and permeability.
2930-2940	10	DOLOSTONE - pale yellowish brown (10YR 6/2) to olive black (5Y 2/1), crystalline, fine-grained, saccharoidal texture, well indurated, occasional cavity/large vug with secondary crystal growth on surface, rare pinpoint vugs, poor apparent porosity and permeability.

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2940-2950	10	DOLOSTONE - light olive gray (5Y 6/1) to moderate yellowish brown (10YR 6/2) to olive black (5Y 2/1), crystalline, fine to coarse-grained, variable texture, well indurated, occasional cavity/large vug with secondary crystal growth on surface, rare pinpoint vugs, poor apparent porosity and permeability.
2950-2960	10	DOLOSTONE - moderate yellowish brown (10YR 5/4) to dusky yellowish brown (10YR 2/2), crystalline, medium to large-grained, moderately to well indurated, occasional cavity/large vug with secondary crystal growth on surface, poor apparent porosity and permeability.
2960-2970	10	DOLOSTONE - moderate yellowish brown (10YR 6/2), crystalline, fine- to medium-grained, well indurated, saccharoidal, minor cavity/ large vugs with secondary crystal growth on surface, poor apparent porosity and permeability.
		Dolostone - dusky yellowish brown (10YR 2/2) to grayish black (N2), crystalline, medium-grained, well indurated, occasional cavity/large vug with secondary crystal growth on surface, poor apparent porosity and permeability.
2970-2980	10	DOLOSTONE - olive gray (5Y 4/1) to dark yellowish brown (10YR 4/2), crystalline, coarse to medium-grained, well indurated, saccaroidal, occasional cavity/large vug with secondary crystal growth on surface, rare pinpoint vugs, trace lignite, black (N1), poor apparent porosity and permeability.
2980-2990	10	DOLOSTONE - olive gray (5Y 4/1) to dark yellowish brown (10YR 4/2), crystalline, coarse to medium-grained, well indurated, saccaroidal, poor apparent porosity and permeability. Dolostone - moderate yellow (5Y 7/6) to moderate yellowish brown (10YR 5/4), very coarse grained, abundant secondary crystal growth on surface (very friable), variably pinpoint vuggy, poor apparent porosity and permeability.
2990-3000	10	DOLOSTONE - moderate yellowish brown (10YR 5/4) to dusky yellowish brown (10YR 2/2), crystalline, medium-grained, moderately to well indurated, occasional cavity/large vug with secondary crystal growth on surface, poor apparent porosity and permeability.
3000-3010	10	DOLOSTONE - moderate yellowish brown (10YR 5/4) to dusky yellowish brown (10YR 2/2), crystalline, medium to fine-grained, well indurated, occasional cavity/large vug with secondary crystal growth on surface, rare pinpoint vugs, poor apparent porosity and permeability.

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3010-3020	10	DOLOSTONE - moderate yellowish brown (10YR 5/4) to dusky yellowish brown (10YR 2/2), crystalline, medium-grained, moderately to well indurated, occasional cavity/large vug with secondary crystal growth on surface, poor apparent porosity and permeability.
3020-3050	30	DOLOSTONE - moderate yellowish brown (10YR 5/4) to dusky yellowish brown (10YR 2/2), crystalline, medium to fine grained, well indurated, occasional cavity/large vug with secondary crystal growth on surface, rare pinpoint vugs, poor apparent porosity and permeability.
3050-3060	10	DOLOSTONE AND LIMESTONE - moderate yellowish brown (10YR 5/4) to dusky yellowish brown (10YR 2/2), crystalline, fine to medium-grained, well indurated, occasional cavity/large vug with secondary crystal growth on surface, rare pinpoint vugs, poor to fair apparent porosity and permeability. Limestone - grayish orange (10YR 7/4), packstone, fine to medium-grained, friable to moderately indurated, poor to fair apparent porosity and permeability.
3060-3070	10	DOLOSTONE AND LIMESTONE - dark yellowish brown (10YR 4/2) to brownish black (5YR 2/1), crystalline, fine to medium-grained, well indurated, rare cavity/large vug with secondary crystal growth on surface, rare pinpoint vugs, poor apparent porosity and permeability. Limestone - grayish orange (10YR 7/4), packstone, fine to medium-grained, friable to moderately indurated, poor to fair apparent porosity and permeability.
3070-3080	10	DOLOSTONE AND LIMESTONE - moderate yellowish brown (10YR 5/4) to dusky yellowish brown (10YR 2/2), crystalline, medium to coarse grained, friable to well indurated, rare cavity/large vug with secondary crystal growth on surface, rare pinpoint vugs, poor apparent porosity and permeability. Limestone - grayish orange (10YR 7/4), packstone, fine to medium-grained, friable to moderately indurated, poor to fair apparent porosity and permeability.
3080-3090	10	DOLOSTONE - pale yellowish brown (10YR 6/2) to dusky yellowish brown (10YR 2/2), crystalline, medium to coarse grained, well indurated, occasional cavity/large vug with secondary crystal growth on surface, rare pinpoint vugs, poor apparent porosity and permeability.

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3090-3100	10	DOLOSTONE - pale yellowish brown (10YR 6/2) to yellowish gray (5Y 7/2), crystalline, medium to coarse-grained, friable to well indurated, saccaroidal, minor cavity/large vug with secondary crystal growth on surface, rare pinpoint vugs, poor apparent porosity and permeability. Dolostone - brownish black (5Y 2/1) to olive black (5Y 2/1), medium-grained, saccaroidal, well indurated, rare Limestone, very pale orange (10YR 8/2), friable, poor apparent porosity and permeability.
3100-3110	10	DOLOSTONE - pale yellowish brown (10YR 6/2) to dusky yellowish brown (10YR 2/2), crystalline, medium to coarse-grained, well indurated, occasional cavity/large vug with secondary crystal growth on surface, rare pinpoint vugs, poor apparent porosity and permeability.
3110-3120	10	DOLOSTONE - pale yellowish brown (10YR 6/2) to dark yellowish brown (10YR 4/2), microcrystalline to coarse-grained, friable to well indurated, rare pinpoint vugs partially filled with secondary crystal growth, very poor apparent porosity and permeability.
3120-3130	10	DOLOSTONE - pale yellowish brown (10YR 6/2) to dusky brown (5YR 2/2), microcrystalline, well-indurated, sacchoroidal, rare pinpoint vugs partially filled with secondary crystal growth, very poor apparent porosity and permeability.
3130-3140	10	DOLOSTONE - pale yellowish brown (10YR 6/2) to dark yellowish brown (10YR 4/2), microcrystalline, friable to well indurated, rare pinpoint vugs partially filled with secondary crystal growth, very poor apparent porosity and permeability.
3140-3150	10	DOLOSTONE - pale yellowish brown (10YR 6/2) to dark yellowish brown (10YR 4/2), microcrystalline to coarse-grained, friable to well indurated, rare pinpoint vugs partially filled with secondary crystal growth, very poor apparent porosity and permeability.
3150-3200	50	DOLOSTONE - pale yellowish brown (10YR 6/2) to dark yellowish brown (10YR 4/2), microcrystalline, friable to well indurated, rare pinpoint vugs partially filled with secondary crystal growth, very poor apparent porosity and permeability.
3200-3210	10	DOLOSTONE - olive gray (5Y 3/2) to pale yellowish brown (10YR 6/2), microcrystalline, variably indurated (moderate to well), rare pinpoint vugs, secondary crystal growth common on fractured surfaces and in and around vug openings, poor apparent porosity and permeability.

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3210-3250	40	DOLOSTONE - light olive gray (5Y 5/2) to olive gray (5Y 3/2), microcrystalline, well indurated, rare pinpoint vugs, secondary crystal growth common on fractured surfaces and in and around vug openings, poor apparent porosity and permeability.
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