

Cuttings Description
Cascade #1-A

1975' FNL x 600' FWL
Sec. 10, T.6.S., R97W
Garfield County, Colorado

Ground Elev. 8166'
Kelly Bushing 8176'

Cascade #1-A

From	To	Description
0	10'	Siltstone, medium brown, 90%, shale, light gray, 10%.
10	15'	Siltstone, medium brown, slightly ferruginous, 50%, siltstone, light gray, with dark brown inclusions, calcareous, 50%.
20	25'	As above.
25	30'	As above.
30	35'	Siltstone, medium gray, calcareous, with small black inclusions, 80%, siltstone and brown slightly ferruginous, 20%.
35	40'	Siltstone - marlstone, medium gray with small black inclusion, 100%.
40	45'	Siltstone, medium gray, calcareous, 50%, siltstone medium brown, slightly ferruginous.
45	50'	Marlstone, gray brown, slightly varved, 60%, siltstone, medium gray, with darker inclusions.
50	55'	Oil shale, dark brown, calcareous, fine succorsic type structure, 80%, siltstone, gray, with black inclusions, 10%, siltstone, medium brown, limonite staining.
55	60'	Marlstone, light gray brown, slightly varved, 95%, oil shale, dark brown, calcareous, 5%.
60	65'	As above with "cavings."
65	70'	Marlstone, medium brown, slightly varved, (lean oil shale), 40%, marlstone, light gray, 40%, siltstone, gray, with darker inclusions.
70	75'	Missing.
75	80'	Marlstone, medium brown, slightly varved, (lean oil shale), 40%, marlstone, light brown, 40%, siltstone, gray, with darker inclusions, 20%.
80	85'	Marlstone, medium brown, slightly varved.
85	90'	Marlstone, as above, 70%, and oil shale dark brown highly varved, calcareous, 30%, cement from casing contaminating sample.

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From	To	Description
90	95'	Marlstone, light brown, slightly varved, 60%, oil shale, medium brown, varved, calcareous, 40%.
95	100'	As above.
100	105'	As above, with trace of secondary (fracture) calcite.
105	110'	Oil shale, varved medium to dark brown, calcareous, 100%, with traces of secondary "veinlet" calcite.
110	115'	Siltstone, gray, with black inclusions, slightly calcareous, 90%, marlstone, medium brown, 10%.
115	120'	As above.
120	125'	Marlstone, light borwn, slightly varved, 70%, oil shale, dark brown, varved, calcareous, 30%.
125	130'	Oil shale, varved dark brown to medium brown, calcareous, 60%, marlstone, light brown, 30%, siltstone, gray brown, 10%.
130	135'	Oil shale, varved dark brown to medium brown, calcareous, 70%, marlstone, light brown slightly varved, 30%.
135	140'	Oil shale, varved dark brown to medium brown, calcareous, 85%, marlstone, light brown, slightly varved, 15%.
140	145'	Siltstone, white, slightly calcareous, with abundant very fine inclusions of pyrite, 85%, oil shale, varved medium brown to dark brown, 15%.
145	150'	Oil shale, varved dark brown, calcareous, 100%.
150	155'	Oil shale, varved dark brown, calcareous, 50%, marlstone, light brown, 40%, siltstone, gray, with black inclusions, 10%, trace of veinlet calcite.
155	160'	As above.
160	165'	Oil shale, varved medium brown to dark brown, calcareous, 50%, siltstone, gray, with black inclusions.
165	170'	Marlstone, light brown, slightly varved, 60%, oil shale, dark brown, reddish resinous lustre, 30%, siltstone light gray to white, with fine pyrite inclusions, 10%.

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From	To	Description
170	175'	Oil shale, varved medium brown to dark brown, calcareous, 70%, marlstone, light brown, 25%, siltstone, gray with black inclusions.
175	180'	Siltstone, gray brown, with black inclusions, 80%, oil shale, varved dark brown to medium brown, slightly calcareous, 20%.
180	185'	Oil shale, varved medium brown to dark brown, calcareous, 90%, siltstone, gray, with black inclusions, 10%.
185	190'	As above.
190	195'	As above.
195	200'	Oil shale, varved medium brown, calcareous, 100%.
200	205'	Oil shale, varved medium brown to dark brown, calcareous, 70%, marlstone, light brown, slightly varved, 30%, trace of white siltstone with pyrite inclusions.
205	210'	Marlstone, light brown, slightly varved, 50%, oil shale, varved light brown to medium brown, 50%.
210	215'	Siltstone, gray brown, with fine black inclusions, 90%, oil shale, varved light brown to medium brown, calcareous.
215	220'	Marlstone, varved light brown to medium brown, 100%.
220	225'	Marlstone, varved light brown, 50%, oil shale, medium brown, calcareous, 50%.
225	230'	Marlstone, varved light brown to medium brown, 70%, oil shale, dark brown, varved, calcareous, 30%.
230	235'	As above with veinlet calcite showing inclusion of pyrite.
235	240'	Oil shale, varved medium brown to dark brown, calcareous, 70%, marlstone, light brown, 25%, siltstone, gray brown, 5%, trace of secondary calcite.
240	245'	Marlstone, light brown, slightly varved, 60%, oil shale, varved light brown to medium brown, 40%, traces of secondary calcite and gray brown siltstone.

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From	To	Description
245	250'	Oil shale, varved medium brown, calcareous, 70%, marlstone, light brown, 30%.
250	255'	Marlstone, light brown, 50%; oil shale, dark brown, 25%; oil shale medium brown, 25%.
255	260'	Oil shale, varved medium brown to dark brown, calcareous, 100%, traces of light brown limonitic siltstone.
260	265'	Oil shale, varved medium brown, calcareous, 50%, marlstone, light brown, slightly varved, 30%, siltstone, gray brown, with darker inclusions.
265	270'	Marlstone, light brown, 70%; oil shale, varved medium brown to dark brown, 30%.
270	275'	Oil shale, varved medium to dark brown, 70%; marlstone, varved light brown to medium brown, 30%.
275	280'	Oil shale, varved medium brown, calcareous, 50%, marlstone, light brown, 50%.
280	285'	Oil shale, varved medium brown to dark brown, calcareous, 100%, traces of secondary calcite.
285	290'	Oil shale, as above 50%, marlstone, light brown, 50%.
290	295'	As above.
295	300'	As above.
300	305'	As above.
305	310'	As above.
310	315'	Oil shale, varved medium brown to dark brown, calcareous, 100%.
315	320'	Oil shale, as above, 90%, siltstone, light brown, with darker inclusions, 10%.
320	325'	As above, oil shale highly varved.
325	330'	Marlstone, light brown, only slightly varved, 80%; oil shale, varved medium brown to dark brown, calcareous, 20%.

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From	To	Description
330	335'	Oil shale, dark brown to black, dolomitic, 60%, marlstone, light brown to medium brown, 40%, very thin discontinuous stringers of pyrite in the marlstone.
335	340'	Oil shale, varved dark brown, dolomitic, 60%; marlstone, light brown, slightly varved, 40%; traces of secondary calcite.
340	345'	Oil shale, varved medium green brown, dolomitic, 90%; oil shale, varved dark brown, calcareous, 10%.
345	350'	Oil shale, varved dark brown, dolomitic, 70%; marlstone, light brown, slightly varved, 30%.
350	355'	Oil shale and marlstone as above with ratio 90% to 10%.
355	360'	Oil shale, varved medium green brown, calcareous, 80%; marlstone, light brown, 20%.
360	365'	Oil shale, varved medium green brown to dark green brown, calcareous, 80%; marlstone, light brown, 20%.
365	370'	Oil shale, light green brown, calcareous, 50%; marlstone, light brown, 50%.
370	375'	As above.
375	380'	Oil shale, varved dark brown, dolomitic, 60%; marlstone, light brown to green brown, 40%.
380	385'	As above.
385	390'	Marlstone, light brown, 70%; oil shale, varved dark brown, dolomitic, loop bedding structures, 30%.
390	395'	Oil shale, varved dark brown, dolomitic 50%; marlstone, light green brown, 50%.
395	400'	As above.
400	405'	As above.
405	410'	As above.
410	415'	As above.

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From	To	Description
505	510'	Oil shale, varved light brown to medium green brown, calcareous, 90%; oil shale, dark brown, 10%.
510	515'	As above.
515	520'	Oil shale, varved dark brown, dolomitic, 90%; marlstone, light brown, 10%.
520	525'	Marlstone, light brown to green brown, slightly varved, 80%; oil shale varved medium brown to dark brown, 20%.
525	530'	Missing.
530	535'	Oil shale, varved dark brown, calcareous, 90%; marlstone, light brown, 10%.
535	540'	Oil shale, varved medium green brown to dark brown, calcareous, 100%.
540	545'	Oil shale, as above, 70%; marlstone, light brown, 30%; traces of analcitized tuff.
545	550'	Oil shale, dark brown, dolomitic, 70%; marlstone, light green brown, 30%.
550	555'	Marlstone, light green brown, 70%; oil shale, dark brown, dolomitic, 30%.
555	560'	Marlstone, light brown, some limonite staining, 60%; oil shale, varved medium to dark brown, 40%.
560	565'	As above.
565	570'	Oil shale, dark brown to black, slightly calcareous, 59%; marlstone, light brown, slightly varved, 50%.
570	575'	Claystone, light brown, dolomitic, 70%; oil shale, dark brown, calcareous, 30%.
575	580'	Oil shale, dark brown to black, calcareous, 95%; marlstone, light brown, 5%.
580	585'	Marlstone, light brown, slightly varved, 40%; oil shale, dark brown to black, calcareous, 40%; siltstone, light brown to light gray, some hydrocarbon staining, 20%.
585	590'	Marlstone, light brown, slightly varved, 95%; oil shale, dark brown, calcareous, 10%.

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From	To	Description
415	420'	Oil shale, varved dark green to dark brown, slightly calcareous, 95%; marlstone, light brown, 5%.
420	425'	Marlstone, medium green brown, 60; oil shale, varved dark brown, calcareous, 40%.
425	430'	Oil shale, dark brown, calcareous, 80%; marlstone, light brown, 20%.
430	435'	Missing.
435	440'	Oil shale, dark brown, slightly varved, calcareous, 50%; marlstone, light brown, 50%.
440	445'	Marlstone, light to medium brown, slightly varved, 75%; oil shale dark brown calcareous, 25%.
445	450'	Oil shale, varved dark brown, calcareous, 100%.
450	455'	As above.
455	460'	Oil shale, varved medium dark brown to medium green brown, calcareous, 80%; oil shale, dark brown, calcareous, 20%.
460	465'	Oil shale, varved light to dark brown, calcareous, 100%.
465	470'	Oil shale, varved medium to dark brown, calcareous, 70%; marlstone, light brown, 30%.
470	475'	Oil shale, dark brown, calcareous, 50%; oil shale, medium green brown, calcareous, 50%.
475	480'	As above.
480	485'	Marlstone, light green brown, slightly varved, 80%; oil shale, dark brown, calcareous, 20%.
485	490'	Marlstone, light gray brown, slightly varved, 90%; oil shale, dark brown, calcareous, 10%.
490	495'	Claystone, light gray brown, slightly calcareous.
495	500'	Claystone, light gray, slightly calcareous, 60%; oil shale, dark brown, calcareous, 40%, traces of pyrite.
500	505'	Oil shale, varved medium brown to dark brown, calcareous, 85%; marlstone, light gray brown, 15%.

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From	To	Description
590	595'	Marlstone, light gray brown to medium light brown, 100%..
595	600'	Marlstone, very light gray brown, traces of analcitized tuff and traces of secondary calcite, 100%.
600	605'	As above.
605	610'	As above.
610	615'	As above.
615	620'	Oil shale, dark brown to black, dolomitic, 90%; marlstone, light brown, 10%.
620	625'	As above.
625	630'	Marlstone, light brown to medium light brown, slightly varved, 100%.
630	635'	As above.
635	640'	Marlstone, light gray brown to medium light brown, 70%; oil shale, medium to dark brown, 30%.
640	645'	Marlstone, light gray brown, 60%; marlstone medium green brown, 40%.
645	650'	Marlstone, light brown to olive green, 85% oil shale, dark brown, dolomitic, 15%.
650	655'	Marlstone, light gray brown, slightly varved, 100%.
655	660'	Oil shale, varved medium green brown to dark brown, slightly calcareous, 100%.
660	665'	Marlstone, light gray brown, 80%; oil shale, varved medium green brown to dark brown, 20%.
665	670'	As above.
670	675'	Marlstone, light brown, slightly varved, 50%; siltstone, light gray, 40%; oil shale, dark brown, dolomitic, 10%.
675	680'	Marlstone, light brown, slightly varved, 40%; siltstone, light brown, 40%; oil shale, dark brown, dolomitic, 20%.
680	685'	Claystone, green brown, dolomitic, 50%; oil shale, dark brown, dolomitic, 50%.

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From	To	Description
685	690'	As above.
690	695'	Missing..
695	700'	Marlstone, light gray brown, 100%.
700	705'	Oil shale, light green brown, slightly calcareous, 70%; marlstone, light brown, 30%.
705	710'	Siltstone, light gray brown, calcareous, 100%.
710	715'	Siltstone, light gray brown, calcareous, 60%; claystone, light green borwn, 40%.
715	720'	Oil shale, varved green brown to green gray, slightly calcareous, 100%.
720	725'	Siltstone, very light brown to buff, calcareous, 100%.
725	730'	As above.
730	735'	Oil shale, varved medium brown to medium green brown, 60%; marlstone, light brown to medium brown, 40%.
735	740'	Marlstone, varved very light brown to medium brown, 40%; siltstone, light brown, 40%; oil shale, dark brown, 20%.
740	745'	Marlstone, light brown to light green brown, slightly varved, 100%.
745	750'	As above.
750	755'	Oil shale, medium green brown and dark brown to black, 100%.
755	760'	Siltstone, light gray brown to buff, calcareous, 100%.
760	765'	Siltstone, light gray brown to buff, calcareous, 50%; oil shale, medium to dark brown, 30%; claystone, medium green brown, 20%.
765	770'	Siltstone, light borwn to buff, calcareous, 100%.
770	775'	Marlstone, light green brown, 50%; siltstone, light gray to light brown, 50%.
775	780'	Marlstone, green brown, 60%; siltstone, light brown, 40%.
780	785'	As above.
785	790'	As above.

From	To	Description
790	795'	Siltstone, light gray brown, calcareous, slightly varved, 100%.
795	800'	Marlstone, light green brown, to light brown, 60%; siltstone, light brown, 40%.
800	805'	As above.
805	810'	Siltstone, gray, with fine black inclusions, calcareous.
810	815'	As above.
815	820'	Siltstone, as above, 70%; marlstone, light brown, 20%; oil shale, medium brown, 10%.
820	825'	Siltstone, light brown, with small fine black inclusions, calcareous, 100%.
825	830'	Siltstone, gray brown, calcareous, 50%; claystone, green gray, 50%.
830	835'	As above.
835	840'	As above.
840	845'	Siltstone, light gray brown, with fine black inclusions, calcareous, 100%.
845	850'	Siltstone, light gray, 60%; oil shale, varved green brown to dark brown, 40%.
850	855'	As above.
855	860'	Siltstone, gray as above, 100%.
860	865'	Claystone, varved light gray green to medium brown, slightly calcareous, 100%.
865	870'	Siltstone, light gray brown, slightly calcareous, 50%; marlstone, green brown, 50%.
870	875'	Siltstone, light gray brown, 60%; oil shale, dark brown, varved to medium brown, 40%.
875	880'	Siltstone, light gray brown, 80%; oil shale, dark brown, 20%.
880	885'	Sandstone, medium green brown, very fine grained, calcareous, 50%; siltstone, light brown, 50%.
885	890'	Siltstone, light gray brown, calcareous, 100%.

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From	To	Description
890	895'	Claystone, light green brown, slightly calcareous, 60%; siltstone, light gray brown, 40%.
895	900'	Siltstone, light gray brown, calcareous, 85%; oil shale, varved dark green brown, 15%.
900	905'	Siltstone, light gray brown, calcareous, 50%; oil shale dark green brown, 50%.
905	910'	As above.
910	915'	Siltstone, light brown, calcareous, 100%.
915	920'	As above.
920	925'	Siltstone, light brown, calcareous 50%; oil shale, dark brown, calcareous, 50%.
925	930'	As above.
930	935'	As above.
935	940'	As above.
940	945'	As above.
945	950'	As above.
950	955'	Siltstone, gray, calcareous, 100%.
955	960'	Siltstone, as above, 70%; marlstone, light brown, 20%; oil shale, dark brown, 10%.
960	965'	As above.
965	970'	As above.
970	975'	As above.
975	980'	As above.
980	985'	As above.
985	990'	As above.
990	995'	Siltstone, light brown, varved, calcareous, 70%; oil shale, varved dark brown, calcareous, 30%.
995	1000'	Marlstone, light gray and light brown, 60%; oil shale, dark brown, 40%.
1000	1005'	As above.

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From	To	Description
1005	1010'	As above.
1010	1015'	As above.
1015	1020'	As above.
1020	1025'	Siltstone, light brown, calcareous, 40%; marlstone, green brown, 30%; oil shale, dark brown, 30%.
1025	1030'	As above.
1030	1035'	Marlstone, light green brown, 40%; siltstone, light brown, 30%; oil shale, dark brown, 30%.
1035	1040'	As above.
1040	1045'	Siltstone, gray, 60%; marlstone, light green brown, 20%; oil shale, dark brown, 20%.
1045	1050'	As above.
1050	1055'	As above.
1055	1060'	As above.
1060	1065'	Marlstone, light brown, varved 80%; siltstone, light gray, 10%; oil shale, dark brown, 10%.
1065	1070'	As above.
1070	1075'	As above.
1075	1080'	Oil shale, dark brown, calcareous, 50%; marlstone, light green brown, 50%.
1080	1085'	As above.
1085	1090'	As above.
1090	1095	As above.
1095	1100'	Oil shale, varved medium to dark brown, 70%; marlstone, light brown, 30%.
1100	1105'	As above.
1105	1110'	As above.
1110	1115'	Marlstone, light green brown, 60%; oil shale, dark brown, 30%; siltstone, light brown, 10%.
1115	1120'	As above.

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From	To	Description
1120	1125'	Marlstone, light green brown, 80%; marlstone, light brown, 10%; oil shale, dark brown, 10%.
1125	1130'	As above.
1130	1135'	As above.
1135	1140'	As above.
1140	1145'	As above.
1145	1150'	As above.
1150	1155'	As above.
1155	1160'	As above.
1160	1165'	As above.
1165	1170'	Siltstone, light gray, calcareous, 60%; marlstone, light gray brown, 40%.
1170	1175'	As above.
1175	1180'	As above.
1180	1185'	As above.
1185	1190'	Siltstone, light gray, calcareous, 80%; marlstone, light brown, 10%; oil shale, dark brown, 10%.
1190	1195'	Siltstone, light green brown, calcareous, 80%; siltstone, light brown, calcareous, 20%.
1195	1200'	As above with traces of dark brown oil shale.
1200	1205'	Missing.