

**APPENDIX VIII**  
**DRILL CORE LOG**

### Lithology Core Log

<b>Well Name:</b> Captain Cook #1	<b>Operator:</b> Vulcan Minerals Inc.	<b>Drill Contractor:</b> Petro Drilling Ltd. (BBS 56)
<b>Location:</b> Flat Bay Area	<b>License #:</b> 96 - 105	<b>Spud Date:</b> Dec. 18 / 2001 @ 1:00 pm
<b>Surface Coordinates:</b> 5361953 m N 386825 m E		<b>Drill Out Date:</b> Jan. 7 / 2002 @ 9:00 pm
<b>Ground Elevation:</b> 54.00 m	<b>Rotary Head:</b> 58.6 m	<b>Total Depth:</b> 605.2 m, Jan. 29/02 @ 18:00 hrs
<b>Target Formation:</b> Ship Cove Limestone, Anguilles Sandstone / Conglomerate		
<b>Type of Drilling Fluid:</b> Milgel		

<u>Depth</u> (from)	<u>Depth</u> (to)	<u>Lithology</u>	<u>Description</u>	<u>Porosity</u>	<u>Show</u>
0	29.6	Overburden	Surface Casing - Conductor Pipe: 114. 3 mm @ 29.6 m Drilled Out - Jan. 7, 2002		
29.6	35	<b>SS / Cgl</b>	<p>Red - brown to mottled white in part, very coarse grained quartzose sandstone grading to conglomerate in part. Majority (85%) of unit is defined by moderately sorted, sub-angular to sub-rounded quartz grains sometimes containing large subrounded 3-5 cm pebbles / clasts of dark shale or chert (10%), and lesser white to partially grey, sub-angular quartz fragments. Short 20-50 cm zones of clast supported conglomerates are common (ie. 32.2 m), typically dominated by dark, melanocratic pebbles, apparently shale. Consistent with abundant large pebbles is a lighter coloration and softer character presumably due to an increase in argillaceous material within the matrix. Overall unit appears to be a friable coarse grained sandstone with an argillaceous / shaly cement variably grading to a pebble / cobble conglomerate. Rubbly core zone noted at 33. 2 m likely reflective of a fracture zone parallel t.c.a. Also from 34.1 - 34.75 m another 3-5 cm fracture parallel t.c.a. is observed infilled with a partially lithified argillaceous mud. Collectively these zones may be the source of the loss circulation problem encountered last evening.</p> <p><b>@ 30 m: Sandstone (100%):</b> White to light pink/red, lower coarse grained to increasingly upper coarse grained, predominantly quartzose, rare to trace dark chert, red-pink argillaceous mud is common adhered to quartz grains, sub-angular - sub-rounded, poorly sorted, range of grain size, abundant red argillaceous / calcareous cement coupled with minor silica cement, poor to fair intergranular porosity (8-10%), no hydrocarbon stain or show.</p>		

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<u>Depth</u>	<u>Lithology</u>	<u>Description</u>	<u>Porosity</u> <u>Show</u>
(from) 35	(to) 44.9 Cgl / SS	<p>Red - brown to mottled white in part, predominantly spotted red, white or, black, pebble dominated conglomerate grading to very coarse grained sandstone in part. Majority of unit contains ~50%, very poorly sorted, variably sized pebbles ranging from 5 mm to 10 cm, composition of the well rounded clasts are predominantly white grey quartz (50%), lesser red and black shale (35%), and a suite of variably colored subangular-subrounded chert clasts (15%). The remainder (50%) of the unit is a coarse grained sandstone making up the matrix between the pebbles. The sand is primarily composed of quartzose and an abundant red-brown argillitic mud with a minor calcareous component. Overall unit is poorly compacted and lithified and appears consistently friable and unconsolidated. Thin fracture zones are common throughout generally parallel t.c.a.</p> <p><b>@ 35 m:</b> Sandstone (100%): White, minor pink or red in part, predominantly lower coarse grained, 95% quartzose with minor (5%) light and dark chert, sub-rounded to subangular, moderately sorted, very common red brown argillaceous cement with a minor calcareous component, silica cement is also apparent as smaller medium grained, subangular, loose quartzose often adhered to dominant coarse quartzose grains, poor to possibly fair (6-8%) intergranular porosity, no fluorescence or show.</p> <p><b>Note:</b> 100% SS is perhaps misleading considering the obvious conglomerate character revealed from core, however, observation of cuttings will concentrate on finer grained lithology</p> <p><b>@ 40 m:</b> Sandstone (100%): White to slightly pink, increasingly upper coarse grained, predominantly quartzose with trace to minor dark chert, predominantly sub-angular, moderately sorted, dominant red argillaceous cement with a consistent calcareous component, unconsolidated and friable but porosity is likely only poor fair (6-8%) due to the red shaly cement, no indication of hydrocarbons.</p>	

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<u>Depth</u> (from)	<u>Depth</u> (to)	<u>Lithology</u>	<u>Description</u>	<u>Porosity</u>	<u>Show</u>
44.9	51.8	SS	<p>Red - brown to occasionally mottled white, lower coarse grained quartzose sandstone containing increasing dark lithic grains, surrounded by the common red-brown argillaceous cement, sub-rounded fragments and lesser pebbles are relatively common (5-8%), predominantly light and dark chert / shale with lesser white quartz pebbles. Overall sandstone is very similar to that above except for an obvious decrease in fragments and pebbles and an apparent introduction of white clays acting as a secondary cement. Unit remains relatively friable and unconsolidated, dominant argillaceous mud appears to be decreasing.</p> <p><b>47.8-49.2:</b> 1.4 m of rubbly broken sandstone, presumably reflecting a fracture zone, a similar zone of broken core is observed at 50.8 - 51.7 m. In these zones red, water saturated muds are common.</p> <p><b>@ 45 m:</b> Sandstone (100%): White, increasingly pink or red in part, lower coarse grained, predominantly quartzose with minor (5%) light and dark chert, sub-rounded to subangular, moderately sorted, very common red brown argillaceous cement with a trace calcareous component, trace silica cement is also observed (when consolidated), friable, unconsolidated, intergranular porosity is blocked by prevalent red mud thus 6-8% porosity is presumed, no indication (stain or show) of hydrocarbons.</p> <p><b>@ 50 m:</b> As above.</p>		
51.8	53.5	SS/Cgl	<p>Red -brown to spotted white and black in part, lower coarse grained to upper coarse grained, increasingly grading to conglomerate. Majority (80%) of the litholgy is identical to the coarse grained, argillite (cement) rich sands encountered above. The (20%) conglomerate contains smaller 1-2 cm, well rounded, well sorted, white quartz and red &amp; black shale (possibly some chert). Compared to above the pebbles size has significantly decreased and sorting</p>		

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cont...		SS / Cgl	has improved. Sandstone remains poorly consolidated and friable especially where sand is surrounding and adhered too pebbles within conglomerate. <b>51.2-51.7 m:</b> Short interval of fractured sandstone containing 10-15% quartz and shale clast within a muddy argillaceous poorly consolidated quartzose sand.		
53.5	56.1	SS	Red brown increasingly grey, fine to medium grained, sublithic sand composed primarily of (75%) quartzose and lesser (25%) dark and light chert, as well as trace-rare feldspar fragments (?), majority of grains appear to be subangular to occasionally subrounded, fairly well sorted, trace calcareous component (HCl effervescence) associated with a common red brown argillaceous cement, silica cement is also observed at the microscopic level. Unit appears harder with a more siliceous cementation than sands intersected above, well consolidated, silica and argillaceous cement collectively decrease and inhibit porosity to ~ 5-6%. Trace subangular fragments and subrounded pebble of dark shale / chert and/or white grey quartz are observed locally. <b>54.9-55.2:</b> Short interval of broken rubble core presumably indicative of a fracture zone.  <b>@ 55 m:</b> Sandstone (100%): White to light grey, trace pinkish in part, upper fine to lower medium grained, predominantly quartzose (95%) with minor (5%) dark and rare light chert, trace feldspar and argillite grains, rare pyrite, subangular to subrounded, moderate to well sorted, predominantly silica and lesser argillaceous cement, poor to fair (6-8%) intergranular porosity, no indication of hydrocarbon.		
<b>Note:</b> Red sands in core appear white to grey in dried cuttings suggesting red coloration is a consequence of hydrated muds.					

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<u>Depth</u>	<u>Lithology</u>	<u>Description</u>	<u>Porosity</u>	<u>Show</u>
(from)	(to)			
56.1	60.3	<b>Cgl / SS</b> Red - pink to increasingly greyish white, spotted white and black in part (fragments), dominated by abundant (>50%) 1-2 cm (trace 3-5 cm) quartz and lesser black and red shale pebbles surrounded by a medium to coarse grained sandstone matrix. Pebbles are moderately sorted, sub-rounded to rounded, and are typically ~ 1 cm in diameter. Remainder of unit is composed primarily of a medium to coarse grained sandstone, similar to other sand in borehole except red argillaceous component is decreasing significantly, instead the quartzose dominated sand is cemented by lighter white clays and increasing silica. Sand is characterized by moderately sorted quartzose grains and lesser dark chert, generally sub-angular to subrounded. Alternating beds of conglomerates and sandstone likely represent different discrete episodes of deposition.		
		<b>@ 60 m:</b> Sandstone (100%): White to light grey, trace pinkish in part, upper medium to lower coarse grained, predominantly quartzose (95%) with minor (5%) dark and rare light chert, trace feldspar and argillite grains, predominantly subangular, well sorted, predominantly silica and lesser calcareous argillaceous cement, poor to fair (6-8%) intergranular porosity, no indication of hydrocarbon.		
60.3	60.8	<b>Shale</b> Red to brown, fissile, platy, very poorly indurated or lithified, micromicaeous, soft poorly lithified mudstone, trace rounded pebbles adjacent rubbly broken upper and lower contacts.		
60.8	63.4	<b>Cgl / SS</b> Same as above except for a dominant grey coloration with a red tinge locally.		
63.4	64.7	<b>Shale</b> Red to brown, fissile, very poorly indurated or lithified, soft mudstone, micromicaeous, no visible bedding or laminations due to extremely muddy texture of core samples.		

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(from)      (to)				
cont...		<b>63.5 m &amp; 64.2 m:</b> Short rubbly, gravelly zones - fracture zones.		
64.7	70.2 <b>SS / Sltst</b>	Grey to salt in pepper in part, lower very fine grained sandstone grading primarily to siltstone, predominantly quartzose with lesser yet common dark chert and other lithic grains, majority of grains appear to be well rounded and sorted, red-brown cm-scale laminations are observed locally as well as discrete 10-20 cm red, muddy shale beds. Throughout the core alternating grey and red beds are common reflective of hematized / oxidized beds or zonation within the sedimentary pile. Contacts are relatively clean and abrupt perpendicular t.c.a.		
		<b>@ 65 m:</b> Sandstone / Siltstone (100%): Grey to salt and pepper in part, lower very fine grained to predominantly siltstone, (95%) quartzose with minor (5%) dark chert, trace reddish argillite grains with a calcareous component, subangular to subrounded, well sorted, predominantly silica and lesser argillaceous cement, intergranular porosity is limited by cement, tight to poor (4-6%) porosity, no indication of hydrocarbon.		
		<b>@ 70 m:</b> Sandstone / Siltstone (100%): Grey to salt and pepper in part, lower very fine grained to predominantly siltstone, (95%) quartzose with minor (5%) dark chert, trace reddish argillite grains with a calcareous component, subangular to subrounded, well sorted, predominantly silica and lesser argillaceous cement, intergranular porosity is limited by cement, tight to poor (4-6%) porosity, no indication of hydrocarbon.		
70.2	71.3 <b>SS / Cgl</b>	Grey to reddish brown in part, upper coarse grained, grading to conglomerate, predominantly (1-3 mm) quartzose grains with an increasing sub-lithic component comprised of a suite of fragments, ranging from quartz and chert to red and black shale. Overall unit is moderately sorted and majority of grains are sub-rounded (relatively mature). The grains appear to be cemented		

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		<b>SS / Cgl</b>	by mainly silica and red (hematized) argillaceous mud within the sand. Larger quartz, shale and chert pebbles are observed as sizable pebbles (1-5 cm) throughout the unit. Overall sand is very similar to alternating sandstones and conglomerates described above. However, with increase in depth the lithologies appear more consolidated and compacted and muddy / sandy conglomerates are better sorted and less energized considering the significant decrease from cobble to pebble sized fragments.		
71.3	74.3	<b>SS</b>	Red to pinkish, grey in part, upper fine to lower medium grained, quartzose sand, with trace dark and light chert, as well as trace-rare red-pink argillite fragments, majority of grains appear to be subangular to occasionally subrounded, fairly well sorted, rare calcareous component (HCl effervescence) associated with a common red brown argillaceous cement, considering the good consolidation silica cement is presumed present. Red to grey coloration is the result of degrees of hematization of argillic cement. Porosity appear to be relatively poor due to the inhibiting silica and argillaceous cement blocking intgranular porosity. Trace 1-3 cm, subangular fragments and subrounded pebble of dark shale / chert and/or white grey quartz are observed locally.		
74.3	76.5	<b>Cgl / SS</b>	Reddish brown trace grey in part, upper coarse grained, grading to conglomerate, (1-3 mm) quartzose grains with an increasing sub-lithic component makes up the sandy matrix cemented by red argillic muds, the conglomerate component of the lithology is comprised of a suite of fragments, ranging from mainly quartz with red and black shale possibly chert. Fragments are predominantly 1-3 cm, with several grains > 5 cm, overall fragments / pebbles are poorly sorted with a sub-angular habit. Contacts with overlying and underlying sandstone are abrupt. Unit resembles similar beds		



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(from) cont...	(to)	<b>Cgl / SS</b> intersected and described numerous times above.		
		<b>@ 75 m:</b> Sandstone (100%): White to light pink, upper fine to lower medium grained, predominantly quartzose (95%) with minor (5%) dark and rare light chert, trace red argillite grains, predominantly subangular, well sorted, predominantly silica and lesser calcareous argillaceous cement, poor to fair (6-8%) intergranular porosity, no indication of hydrocarbon.		
76.5	88.3	<b>SS</b> Red to pinkish, grey in part, upper medium to lower coarse grained, quartzose sand, with trace dark and light chert, as well as trace-rare red-pink argillite fragments, majority of grains appear to be subangular to occasionally subrounded, fairly well sorted, red brown argillaceous cement, paired with apparent silica cement. Porosity appear to be relatively poor due to the inhibiting silica and argillaceous cement blocking intgranular porosity. There may be some dgeree of graded bedding considering the moderate grain size difference in evaluated cuttings.		
		<b>@ 80 m:</b> Sandstone (100%): White to light pink, upper medium to lower coarse grained, predominantly quartzose with trace dark chert, realitvely common clear mica, and rare red argillite grains, predominantly subangular to sub-rounded, well sorted, predominantly silica and lesser argillaceous cement (rare calcareous component), poor to fair (6-8%) intergranular porosity, no indication of hydrocarbon.		
		<b>@ 85 m:</b> Sandstone (100%): Light pink to white, upper fine to lower medium grained, predominantly quartzose with trace dark and argillite garins as well as micromicaceous crystals / grains, predominantly subangular to sub-rounded,		

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		<b>SS</b>	moderately sorted, predominantly silica and lesser argillaceous cement (rare calcareous component), fair (~ 8%) intergranular porosity, no indication of hydrocarbon stain or show.		
88.3	92.1	<b>Cgl / SS</b>	Reddish brown increasingly mottled grey and white, upper coarse grained, grading to predominantly conglomerate with 1-2 cm pebbles and lesser angular fragments. Quartz pebbles and lesser red + black shale fragments make up mineralogy, typically sub-rounded to sub-angular in part and moderately sorted. Conglomerate is cemented by a coarse grained sublithic sandstone, majority of sand grains are quartzose with lesser dark chert and trace mica, red argillaceous cement is common but decreasing, silica cement is also presumed considering the hardness, good consolidation, and relatively poor to fair intergranular porosity.		
			<b>@ 90 m:</b> Sandstone (100%): White to light pink, upper medium to lower coarse grained, predominantly quartzose with trace dark chert, relatively common clear mica, and rare red argillite grains, predominantly subangular to sub-rounded, well sorted, predominantly silica and lesser argillaceous cement (rare calcareous component), poor to fair (6-8%) intergranular porosity, no indication of hydrocarbon.		
92.1	93.1	<b>SS / Siltst</b>	Grey to salt in pepper in part, lower very fine grained sandstone grading primarily to siltstone, predominantly quartzose with lesser yet common dark chert and other lithic grains, majority of grains appear to be well rounded and sorted, red-brown cm-scale laminations are observed locally as well as discrete 10-20 cm red, muddy shale beds.		
93.1	101.2	<b>Cgl</b>	Red - pink to increasingly spotted white and black in part (fragments), dominated by abundant (>75%), 1-8 cm (majority 2-3 cm) quartz and lesser black		

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<u>Depth</u>	<u>Lithology</u>	<u>Description</u>	<u>Porosity</u>	<u>Show</u>
(from) cont...	(to)	<b>Cgl</b>	and red shale pebbles surrounded by a medium to coarse grained sandstone matrix. Pebbles are poorly sorted, sub-rounded to rounded, and are typically ~ 2-3 cm in diameter. Remainder (25%) of unit is composed primarily of a coarse grained sandstone, similar to other sand in borehole. Red argillaceous cement is decreasing significantly, instead the quartzose dominated sand is cemented by lighter white clays and increasing silica. Sand is characterized by moderately sorted quartzose grains and lesser dark chert, generally sub-angular to subrounded. Overall, unit is a better consolidated conglomerate with increasing cobble sized clasts, compared to above. <b>100-100.3 m:</b> Rubbly, muddy core, fractures zone.	
			<b>@ 95 m:</b> Sandstone (100%): White to occasionally light pink, upper coarse grained, predominantly quartzose with increasing dark chert, common red brown argillite grains, predominantly subangular to sub-rounded, moderately to poorly sorted, predominantly white and red calys (argillaceous) cement (rare calcareous component), fair to possibly good (8-12%) intergranular porosity, no indication of hydrocarbon.	
			<b>@ 100 m:</b> Sandstone (100%): As above.	
101.2	114	<b>SS</b>	Pink to increasing mottled white, upper medium to lower coarse grained, quartzose sand, with trace dark and light chert, as well as minor red-pink argillite fragments, majority of grains appear to be subangular to occasionally angular, fairly well sorted, pink argillaceous cement paired with apparent silica cement. Porosity appear to be relatively poor, possibly fair due to the inhibiting silica and argillaceous cement blocking intergranular porosity. Trace (<1%) white quartz pebbles or dark shale are observed locally	

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	<b>SS</b>	as discrete clasts within sand. <b>104.5-106 m:</b> Rubbly broken core, fracture zone.	
	<b>SS / Cgl</b>	<b>&gt;105 m:</b> Sand becomes increasingly filled (up to 10%) with large subangular fragments or subrounded pebbles of white quartz, dark grey chert and black + red shale, similar to SS / Cgl described above.	
		<b>@ 95 m:</b> Sandstone (100%): White to light pink in aprt, upper medium to lower coarse grained, predominantly quartzose with trace dark chert, common red brown argillite grains (cement fragments), predominantly subangular to sub-rounded, moderately sorted, predominantly pink argillaceous cement (very rare calcareous component) poor to fair (6-8%) intergranular porosity, no hydrocarbon stain, flourescence, or show.	
		<b>@100 m:</b> As above.	
		<b>@ 105 &amp; 110 m:</b> Sandstone (100%): White to light pink in aprt, upper medium to lower coarse grained, predominantly quartzose with trace dark chert, common red brown argillite grains (cement fragments), predominantly subangular to sub-rounded, moderately sorted, predominantly pink argillaceous cement (very rare calcareous component) poor to fair (6-8%) intergranular porosity, no hydrocarbon stain, flourescence, or show.	
114	133.3	<b>Cgl / SS</b> Red - pink to increasingly spotted white and black in part (fragments), dominated by abundant (>50%), 1-8 cm (majority 3-5 cm) quartz and lesser black and red shale pebbles surrounded by a medium to coasre grained sandstone matrix. Pebbles are poorly sorted, sub-rounded to rounded, and are typically ~ 3-5 cm in diameter. Remainder (25%) of unit is composed primarily of a coarse grained sandstone, similar to other sand in borehole. Sand is characterized by moderately sorted quartzose grains and lesser dark chert, generally sub-angular to subrounded. Short intervals of muddy shale cementing	

### Lithology Core Log

<b>Well Name:</b> Captain Cook #1	<b>Operator:</b> Vulcan Minerals Inc.	<b>Drill Contractor:</b> Petro Drilling Ltd. (BBS 56)
<b>Location:</b> Flat Bay Area	<b>License #:</b> 96 - 105	<b>Spud Date:</b> Dec. 18 / 2001 @ 1:00 pm
<b>Surface Coordinates:</b> 5361953 m N      386825 m E	<b>Drill Out Date:</b> Jan. 7 / 2002 @ 9:00 pm	
<b>Ground Elevation:</b> 54.00 m	<b>Rotary Head:</b> 58.6 m	<b>Total Depth:</b> 605.2 m, Jan. 29/02 @ 18:00 hrs
<b>Target Formation:</b> Ship Cove Limestone, Anguilles Sandstone / Conglomerate		
<b>Type of Drilling Fluid:</b> Milgel		

<u>Depth</u>	<u>Lithology</u>	<u>Description</u>	<u>Porosity</u> <u>Show</u>
(from) cont...	(to)	<b>Cgl</b>	
		<p>pebbles are observed especially in heavily fractured and broken zones.</p> <p><b>114.2-116.7 &amp; 117.8-119.2 m:</b> Rubbly, muddy core, containing abundant loose quartz and chert pebbles in a bright red poorly lithified mud, represents sizable fracture zone. Entire zone is mainly quartz pebble conglomerates with common interbeds of medium to coarse grained, quartzose sandstones.</p> <p><b>120.8-123.6, 126.3-128.3:</b> Other rubbly broken core intervals, presumably bad fracture zones.</p> <p><b>@115 m:</b> As above at 105-110 m.</p> <p><b>@ 120 - 130 m:</b> Sandstone (100%): Pink to occasionally white, upper medium to lower coarse grained, predominantly quartzose with trace dark chert, common red brown argillite grains (cement fragments), predominantly subangular to sub-rounded, moderately sorted, predominantly pink argillaceous cement (very rare calcareous component), minor silica, poor to fair (6-8%) intergranular porosity, no hydrocarbon stain, fluorescence, or show.</p>	
133.3	137.5	<b>SS</b>	
		<p>Pink to increasing mottled white, upper fine to lower medium grained, quartzose sand, rare dark and light chert, as well as minor red-pink argillite fragments, majority of grains appear to be subangular to occasionally angular, fairly well sorted, pink argillaceous cement paired with apparent silica cement. Porosity appear to be relatively poor, possibly fair due to the inhibiting silica and argillaceous cement blocking intgranular porosity. Minor (&lt;5%) white quartz pebbles or dark shale are observed locally Alternating laminations of red and grey are observed locally, hematization / oxidation factor. 10-20 cm beds of 3-5 cm pebble conglomerates are common throughout (similar to Cgl described above).</p> <p><b>@ 135 m:</b> Sandstone (100%): Pink to occasionally white, upper fine to lower medium grained, predominantly loose quartzose, common red brown argillite grains (cement fragments), generally subangular to sub-rounded, well sorted,</p>	

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<u>Depth</u> (from) cont...	<u>(to)</u>	<u>Lithology</u>	<u>Description</u>	<u>Porosity</u>	<u>Show</u>
		<b>SS</b>	predominantly pink argillaceous and minor silica cement (very rare calcareous component), fair (8-10%) intergranular porosity, no hydrocarbon stain, fluorescence, or show.		
137.5	166.7	<b>Cgl / SS</b>	Same as above @ 114 m. Regular occurrences of rubbly broken core of considerable lengths. <b>@ 140 - 165 m:</b> Sandstone (100%): Pink to occasionally white, upper medium to lower coarse grained, predominantly quartzose with trace dark chert, common red brown argillite grains (cement fragments), predominantly subangular to sub-rounded, moderately sorted, predominantly pink argillaceous cement (very rare calcareous component), minor silica, poor to fair (6-8%) intergranular porosity, no hydrocarbon stain, fluorescence, or show.		
166.7	197.5	<b>Shale</b>	Red to brown, fissile, platy, very poorly indurated or lithified, micromicaeous, soft poorly lithified mudstone, rubbly broken upper contact <b>188.9-189.5 m:</b> Thin bed of dark grey to black muddy shale.		
197.5	201	<b>Salt</b>	Dark to light grey, occasionally reddish and black adjacent upper contact, crystalline, vitreous, very soft, muddy laminations in part (red & black) - interbedded shales & salt (top ~ 1.5 m).		
201	212	<b>Shale</b>	Red brown, fissile, poorly indurated, extremely muddy shale or mudstone containing 40-50% dirty muddy salt. <b>&gt; 205 m:</b> Shale remains interbedded with abundant salt stringers, however shale is increasingly harder and siliceous, cherty in part, common calcareous component - limy shale, lithology is also becoming progressively grey vs red.		
212	217.8	<b>Salt</b>	Reddish brown to medium grey in part, vitreous, very soft, grading to salty shale,		

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<u>Depth</u> (from) cont...	<u>(to)</u>	<u>Lithology</u>	<u>Description</u>	<u>Porosity</u> <u>Show</u>
		<b>Salt</b>	common brown to increasingly grey shale laminations, 80% salt, 20% shale.	
217.8	267.5	<b>Salt</b>	Light to dark grey, increasingly white, coarse grained, crystalline, vitreous, soft, clean salt formation. <b>254.5 m:</b> 10 cm lamination of reddish brown salt containing minor muddy material, similar thin laminations observed throughout section.. <b>&gt; 260 m:</b> alternating grey color changes to predominantly white, coarse grained, granular, crystalline salt.	
267.5	276	<b>Mdst / Shale</b>	Medium to dark grey, reddish brown in part, blocky, predominantly soft, harder and consolidated (271-273), micromicaeous, calcareous cement, grading to limey shale in part, trace discrete reddish salt fragments observed locally (adjacent upper contact).	
276	277	<b>Sltst</b>	Medium brown to partially grey, predominantly quartzose, grading to silty shale in part, gritty, hard, quite consolidated, slightly calcareous, silica and lesser calcareous and argillaceous cement, poor to fair intergranular porosity (6-8%), no prospective hydrocarbon fluorescence or show. Lower contact is partially brecciated by red-pink salt stringers as well as 1-2 cm, euhedral, isolated crystals of pink (potassic) salt within siltstone.	
277	279.6	<b>Salt</b>	Predominantly light to medium grey, mottled white and granular in part, clear to translucent, vitreous, crystalline, coarse grained, common pink to red mm-scale wispy laminations of potassium rich salt (KCl), preferentially vuggy (washed out by brine?), ie. 278.6- 279.6 m	
279.6	283	<b>Salt</b>	Pink to red, orange in part, common dark grey laminations (dusty argillite), occassionally mottled white, vitreous , coarse grained, crystalline, relatively hard and glassy.	

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<u>Depth</u> (from)	<u>Depth</u> (to)	<u>Lithology</u>	<u>Description</u>	<u>Porosity</u>	<u>Show</u>
283	296	<b>Salt / Mdst</b>	<p>Interbedded pink to orange salt (as above) and dark grey, soft, shaly mudstone (as above), mudstone generally contains vitreous mm-scale stringers, and discrete euhedral ink crystals of salt (halite). Pink originally perceived as KCl may actually be a consequence of oxidation / hematization of grain surfaces.</p> <p><b>@ 285.4 m:</b> 1 m zone of dark grey mud containing similar stringers and crystals of pink to red salt, as above, notably a bedding plane ~40 deg. t.c.a. is observed.</p> <p><b>287.8-293 m:</b> More red-pink preferentially dissolved K-rich salt as observed above at 278.6 m, progressively vuggy and unconsolidated (nickel 'n' dime rock), partially broken and rubbly, appears to be dissolving, bitter taste and cubic crystals suggest the presence of Sylvelite or maybe carnallite?</p>		
296	298	<b>Salt</b>	<p>Pink to red, orange in part, common dark grey laminations (dusty argillite), occasionally mottled white, vitreous, coarse grained, crystalline, relatively hard and glassy.</p>		
298	341.3	<b>Salt</b>	<p>Light to dark grey, increasingly white, mottled white in part, coarse grained, crystalline, vitreous, alternating dark grey argillaceous zones with lesser white to translucent, crystalline, regularly increasing white blebs and subangular grains of gypsum (or anhydrite).</p> <p><b>306.6-318.4 m:</b> Salt becomes progressively whiter and clean, practically no dark grey laminations of dusty argillaceous material, generally mottled with white gypsum or anhydrite.</p> <p><b>&gt; 308.5 m:</b> Variably sized (1-5 cm), sub-angular white fragments (3-5%) are observed throughout, presumably anhydrite?</p> <p><b>318.4-323.7 m:</b> Darker grey, 'dusty' salt, as above.</p> <p><b>&gt;323.7 m:</b> As above @ 306.6 m</p> <p><b>328.7 m:</b> Pink to red laminations of hematized / oxidized salt, similar in appearance to KCl salt above but lacks vuggy preferential dissolving.</p> <p><b>330-331.5 m:</b> Dark grey to brown, increasingly dirty salt section.</p>		



### Lithology Core Log

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<b>Surface Coordinates:</b> 5361953 m N    386825 m E		<b>Drill Out Date:</b> Jan. 7 / 2002 @ 9:00 pm
<b>Ground Elevation:</b> 54.00 m	<b>Rotary Head:</b> 58.6 m	<b>Total Depth:</b> 605.2 m, Jan. 29/02 @ 18:00 hrs
<b>Target Formation:</b> Ship Cove Limestone, Anguilles Sandstone / Conglomerate		
<b>Type of Drilling Fluid:</b> Milgel		

<u>Depth</u> (from)	<u>Depth</u> (to)	<u>Lithology</u>	<u>Description</u>	<u>Porosity</u>	<u>Show</u>
341.3	343	<b>Salt</b>	Light brown, partially tan colored, increasingly mottled white, coarse grained, crystalline, significant increase (5-10%) in 2-3 cm, white blebs and subangular grains of gypsum, trace dark fragments also observed.		
	343	<b>Salt</b>	Medium to dark grey (translucent), occasionally mottled white in part, coarse grained, crystalline, glassy, "dusty" salt as described above.		
357.5	376.5	<b>Anhydrite</b>	Light to medium grey, bluish grey in part, massive, cryptocrystalline, hard, clean, glassy and vitreous, moderately calcareous, abrupt upper contact. <b>End of Top Hole: Jan. 17/01 @ 4:00 am.</b>		
			<b>Drill Out Casing Shoe: Jan. 25/02 @ 2:30 pm.</b>		
376.5	450	<b>Anhydrite</b>	Light grey to white, slightly mottled white in part, less massive, more granular appearance, coarse crystalline, remains hard and vitreous, very calcareous, possibly limy cement, no indication of hydrocarbon. Moderate variation from massive, bluish, cryptocrystalline, anhydrite to the coarse crystalline, mottled white limey anhydrite described above. <b>&gt; 430 m:</b> Light brown mottled sections containing wispy, net-textured, tan hydrocarbon saturated cement. Moderate to strong hydrocarbon smell throughout, yellow spotty fluorescence, and weak yellow cut. Aside wispy textured hydrocarbon staining, stronger dark brown oil staining is observed along fracture planes. Majority of oil staining appears to be controlled by fractures, especially evident with increasing depth.	<b>Fracture</b> ( <b>&lt; 1%</b> )	<b>X</b>
450	476.3	<b>Anhydrite</b>	Light grey to white, partially bluish, massive and homogeneous, cryptocrystalline, hard and glassy (vitreous), moderately calcareous,	<b>Fracture</b> ( <b>1-2%</b> )	<b>X</b>

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<b>Type of Drilling Fluid:</b> Milgel		

<u>Depth</u> (from)      (to) cont...	<u>Lithology</u>	<u>Description</u>	<u>Porosity</u>	<u>Show</u>
	<b>Anhydrite</b>	minor hairline fractures containing medium brown oil, 1-2% fracture porosity, minor hydrocarbon staining, yellow spotty fluorescence and yellow-white cut adjacent hairline fractures. All indications of hydrocarbons and reservoir potential appear to 100% controlled by fracture porosity.  > 460 m: Increasing (10%) wispy light brown to tan, cryptocrystalline, stringers of calcite (siderite within coarse crystalline anhydrite), alternating with 20-30 cm blue laminations (beds) of hard, extremely glassy, cryptocrystalline anhydrite, weak hydrocarbons remain adjacent fractures as mentioned earlier.	Fracture	X
476.3 ~478	<b>Shale / Ls</b>	Thin zones of interbedded grey to buff calcareous shale (within anhydrite), grading to muddy limestone in part, mm-scale augen shaped laminae (lenses) characterize the 20-30 cm beds of calcareous material. Laminations are partially fragmented and appear to resemble algal mats with stromatolitic features possibly indicative of the upcoming Ship Cove limestone. No hydrocarbon odour or staining is observed		
478	497.5 <b>Anhydrite</b>	Light grey to white, bluish in part, coarse crystalline to occasionally cryptocrystalline (blue bands) hard & vitreous, slightly calcareous, no indication of hydrocarbon, as above @ < 430 m.		
497.5	498.5 <b>Shale / Ls</b>	Buff colored, finely laminated, calcareous shale grading to muddy limestone in part, similar to thin limy interbeds seen above @ 476.3 m, strong hydrocarbon odour is evident as well as trace spotty yellow fluorescence and poor yellow cut. Trace hairline fractures parallel the calcareous shaly laminations appear to contain oil stain, fracture controlled porosity. Bedding laminations are ~ 75-80 deg. t.c.a. suggesting stratigraphy is not perfectly flat lying.		

### Lithology Core Log

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<b>Type of Drilling Fluid:</b> Milgel		

<u>Depth</u> (from)	<u>Depth</u> (to)	<u>Lithology</u>	<u>Description</u>	<u>Porosity</u> <u>Show</u>
498.5	592	<b>Anhydrite</b>	Light grey to blue, increasing mottled white, predominantly coarse crystalline, hard & vitreous, quite homogeneous, increasingly calcareous. Rare indications of hydrocarbon, locally, moderate odour and weak brown oil staining within and adjacent too thin hairline fractures, spotty yellow fluorescence paired with a streaming yellow to white cut is typical. Fracture controlled porosity, < 1%. Very similar to anhydrite above.  > <b>530 m:</b> Increasingly mottled white presumably an increased gypsum component. Majority of anhydrite is blue, glassy cryocrystalline that contain a white, softer gypsum. No indications, odour or stain, of hydrocarbon. <b>@ 584.8 m:</b> Increasingly limy anhydrite, buff to cream colored wispy, crenulated limy / calcareous laminations of muddy limestone. Thin 20-30 cm dark grey beds of calcareous shales are also observed over a 1 m interval of transition bewteen anhydrite & limestones.	
592	593.5	<b>Limestone</b>	Dark buff to cream, dary greyish in part, finely laminated / crenulated (85 deg. t.c.a.) stromatilitic limestones interbedded with lesser dark grey calcareous shales. Algae stromatolitic beds are partially breccaited and boudined locally, cryptocrystalline - microcrystalline, moderately hard, possible mouldic replacement locally, no apparent porosity or indication of hydrocarbon.	
593.5	597	<b>Anhydrite</b>	Medium to aqua blue, mottled white in part, cryptocrystalline, very glassy, hard, partially calcareous, buff-cream mm-scale limestone crenulations throughout, anhydrite interbedded with algal stromatolitic limestones.	

### Lithology Core Log

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Type of Drilling Fluid: Milgel		

<u>Depth</u> (from)	<u>(to)</u>	<u>Lithology</u>	<u>Description</u>	<u>Porosity</u>	<u>Show</u>
597	604	<b>Limestone</b>	Dark buff to cream, increasingly dark grey, very finely laminated, algal stromatolitic limestone grading to calcareous shale in part, partially fragmented and augmented brecciated laminae are relatively common throughout. > 601 m lithology becomes progressively dark grey and thus shaly - calcareous shale. No indication of hydrocarbon. <b>@ 600 m:</b> Dark to medium grey, buff in part, muddy argillaceous limestone grading to calcareous shale in part, well indurated, sub-fissile to blocky, partially micromicaceous, no hydrocarbon.		
		<b><u>BASEMENT</u></b>			
604	605.2	<b>Granitoid / Gneiss</b>	Dark green, mottled pink and white (K-feldspar, quartz), locally light green (epidote), melanocratic granitoid, composed primarily of dark green very fine grained hornblende (50%), surrounding megacrysts (.5 - 3 cm) of euhedral K-feldspar phenocrysts (30%), and lesser grey plagioclase (10%) and quartz (10%). Majority of the K-feldspar and plagioclase crystals have been saussureterized / altered to light green epidote. A weak irregular fabric can be observed locally ~ parallel t.c.a. , undisputably granitoid basement rock. Upper abrupt contact staggered by 3-5 cm of granite "wash".		

**Total Depth: 605.2 m, Jan. 29 @ 6:30 pm.**