TABLE 2
ORGANIC CARBON RESULTS AND GROSS LITHOLOGIC DESCRIPTIONS

GEOCHEM SAMPLE NUMBER	DEPTH	GROSS LITHOLOGIC DESCRIPTION	G S A Colour Code	TOTAL ORGANIC CARBON (% of Rock)
553-123	3160-170m	A 70% Shale, subfissile to blocky, platy in parts, mod. hard, sl. calc., mostly turbodrilled, medium grey	N5	0.94
		B 20% Shale, platy, fissile, mod. hard, non calc., mod. caved, medium dark grey	N4	1.02,0.98
		C 10% Shale, silty, platy, mod. hard, non calc., mod. caved, medium grey Minor other shale, mostly caved	N5	0.50
553-124	3170-180m	A 98% Shale, as 553-123A Minor other shale and limestone	N5	0.60
553-125	3180-190m	A 98% Shale, as 553-123A, minor cavings Minor other shale	N5	0.96
553-126	3190-200m	A 98% Shale, as 553-123A Minor other shale	N5	0.94
553-127	3200-209m	A 55% Shale, fissile, platy, mod. hard, very sl. calc. to non calc., minor cavings, dark to medium dark grey	N3-N4	0.98
		B 45% Shale, fissile, platy, silty in part, soft to mod. hard, mod. cavings, medium light grey Minor other shale, mudstone and sandstone	N6	0.52
553-128	3209-218m	A 80% Shale, as 553-127A	N3-N4	0.92
		B 20% Shaly Mudstone, blocky, mod. hard, sl. calc., silty in parts, medium grey to medium olive grey Minor other shale, mostly caved	N5-5Y5/1	0.56
553-129	3218-227m	A 80% Shale, as 553-127A	N3-N4	1.06
		B 20% Shaly Mudstone, as 553-128B Minor other shale and mudstone, abundantly caved	N5-5Y5/1	0.94,0.89
553-130	3227-236m	A 80% Shale, as 553-127A, mod. caved	N3-N4	0.86
		B 20% Shaly Mudstone, as 553-128B Minor other shale, siltstone, abundantly caved	N5-5Y5/1	1.00
553-131	3236-245m	A 90% Shale, as 553-127A, mod. caved	N3-N4	1.12
		B 10% Shaly Mudstone, as 553-128B Minor other shale, siltstone	N5-5Y5/1	1.02
553-132	3245-254m	A 98% Shale, as 553-127A, mod. caved Minor other shale, mudstone and limestone	N3-N4	1.10

Abbreviations = argillaceous, calcareous, Cut, Fluorescence, slightly

TABLE 2
ORGANIC CARBON RESULTS AND GROSS LITHOLOGIC DESCRIPTIONS

GEOCHEM SAMPLE NUMBER	DEPTH	GROSS LITHOLOGIC DESCRIPTION	G S A Colour Code	TOTAL ORGANIC CARBON (% of Rock)
553-133	3254-263m	A 98% Shale, platy, fissile, mod. hard, sl. to non calc., mod. caved, medium dark grey to medium grey Minor other shale and limestone	N4-N5	1.00
553-134	3263-272m	A 98% Shale, as 553-133A, mod. cavings Minor other shale and limestone Lost circulation material - cement, metal	N4-N5	0.90
553-135	3272-281m	A 98% Shale, as 553-133A, mod. caved Minor limestone and sandstone	N4-N5	1.20,1.18
553-136	3281-290m	A 98% Shale, as 553-133A, abundantly caved Minor limestone and sandstone	N4-N5	1.10
553-137	3290-299m	A 98% Shale, as 553-133A, mod. caved Minor limestone and sandstone	N4-N5	0.93
553-138	3299-308m	A 60% Shale, fissile, platy, mod. hard, non calc., mod. caved, medium dark grey	N4	1.00
		B 40% Mudstone, blocky, soft, very calc., medium light grey Minor sandstone	N6	0.64
553-139	3308-317m	A 70% Mudstone, as 553-138B	N6	0.70
		B 30% Shale, as 553-138A, mod. caved Minor limestone	N4	0.78,0.82
553-140	3317-326m	A 80% Mudstone, as 553-138B	N6	0.60
		B 20% Shale, as 553-138A, mod. caved Minor limestone	N4	0.88
553-141	3325-335m	A 55% Shale, platy, fissile, mod. hard, non calc., mod. caved, medium dark grey	N4	0.90
		B 30% Mudstone, as 553-138B	N6	0.62
		C 15% Mudstone, blocky, soft, sl. calc., medium grey Minor limestone	N5	0.81
553-142	3335-344m	A 70% Shale, platy, fissile, mod. hard, very sl. calc. to non calc., dark grey	N3	0.98,0.94
		B 20% Silty Mudstone, blocky, mod. hard, calc., medium grey	N5	0.74

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TABLE 2
ORGANIC CARBON RESULTS AND GROSS LITHOLOGIC DESCRIPTIONS

GEOCHEM SAMPLE NUMBER	DEPTH	GROSS LITHOLOGIC DESCRIPTION	G S A Colour Code	TOTAL ORGANIC CARBON (% of Rock)
553-142	3335-344m	C 10% Sandstone, blocky, fine grained, quartzitic, calc. cement, some arg. material, dull patchy yellow F., strong milky C., pinkish grey Minor limestone Minor lost circulation material	5YR8/1	
553-143	3344-353m	A 60% Shale, platy, fissile, mod. hard, very sl. calc. to non calc., dark grey	N3	1.32
		B 40% Sandstone, as 553-142C Minor mudstone, other shale	5YR8/1	
553-144	3353-362m	A 55% Shale, as 553-143A, mod. caved	N3	1.64
		B 45% Sandstone, as 553-142C Minor mudstone, other shale	5YR8/1	
553-145	3362-371m	A 85% Shale, as 553-143A, mod. caved	N3	1.12
		B 15% Sandstone, as 553-142C Minor mudstone and limestone Minor lost circulation material - drilling mud	5YR8/1	
553-146	3371-380m	A 90% Shale, as 553-143A, mod. caved	N3	0.90,0.86
		B 10% Sandstone, as 553-142C Minor limestone Minor lost circulation material	5YR8/1	
553-147	3380-389m	A 85% Shale, as 553-143A, mod. caved	N3	0.82
		B 15% Sandstone, as 553-142C, dull patchy yellow F., strong milky C.	5YR8/1	
553-148	3389-398m	A 70% Shale, as 553-143A, mod. caved	N3	0.62
		B 15% Sandstone, as 553-142C, mostly unconsolidated	5YR8/1	
		C 15% Lost circulation material - mud, paint		
553-149	3398-407m	A 80% Shale, as 553-143A, mod. caved	N3	0.86
		B 20% Sandstone, as 553-142C Minor other shale	5YR8/1	
553-150	3407-416m	A 90% Shale, as 553-143A, mod. caved	N3	1.88
		B 10% Lost circulation material - mud Minor sandstone		
553-151	3416-425m	A 65% Shale, as 553-143A, mod. caved	N3	0.98
		B 35% Sandstone, as 553-142C, patchy oil staining, strong yellow F., strong milky C.	5YR8/1	
553-152	3425-434m	A 70% Shale, as 553-143A, mod. caved	N3	0.76
		B 30% Sandstone, as 553-142C	5YR8/1	

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TABLE 2
ORGANIC CARBON RESULTS AND GROSS LITHOLOGIC DESCRIPTIONS

GEOCHEM SAMPLE NUMBER	DEPTH	GROSS LITHOLOGIC DESCRIPTION	G S A Colour Code	TOTAL ORGANIC CARBON (% of Rock)
553-153	3434-443m	A 55% Shale, platy, fissile, mod. hard, very sl. calc. to non calc., dark grey	N3	1.05,1.12
		B 45% Sandstone, blocky, fine grained quartzitic, calc. cement, pale yellow F., pale milky C., pinkish grey	5YR8/1	
		Minor lost circulation material - mud		
553-154	3443-452m	A 55% Shale, platy, fissile, mod. hard, very sl. calc. to non calc., dark grey to medium dark grey	N3-N4	1.32
		B 25% Shaly Mudstone, blocky, mod. hard, sl. calc., medium grey	N5	0.50
		C 20% Sandstone, mostly quartz, fine grained, subrounded to subangular, some arg. material, calc. cement, patchy white F., pale milky C., pinkish grey	5YR8/1	
553-155	3452-461m	A 80% Shale, as 553-154A, mod. caved	N3-N4	1.36
		B 20% Sandstone, as 553-154C	5YR8/1	
		Minor mudstone		
		Lost circulation material - metal, mud and rubber		
5530156	3461-470m	A 90% Shale, thinly fissile, mod. hard, sl. calc. to calc., sl. micaceous, medium grey	N5	0.62
		B 10% Shale, thinly fissile, mod. hard, non calc., greyish black	N2	1.98
		Minor sandstone		
		Minor lost circulation material and metal turnings		
553-157	3470-479m	A 90% Shale, as 553-156A	N5	0.73
		B 10% Shale, as 553-156B	N2	1.89
		Minor sandstone, other shale		
		Minor lost circulation material and metal turnings		
553-158	3479-488m	A 90% Shale, as 553-156A	N5	0.76
		B 10% Shale, as 553-156B	N2	
		Minor sandstone, other shale		
		Minor lost circulation material - paint and metal turnings		
553-159	3488-497m	A 90% Shale, as 553-156A	N5	0.66
		B 10% Shale, as 553-156B	N2	1.86
		Minor sandstone, minor lost circulation material, rubber and metal turnings		

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TABLE 2
ORGANIC CARBON RESULTS AND GROSS LITHOLOGIC DESCRIPTIONS

GEOCHEM SAMPLE NUMBER	DEPTH	GROSS LITHOLOGIC DESCRIPTION	G S A Colour Code	TOTAL ORGANIC CARBON (% of Rock)
553-160	3497-506m	A 80% Shale, thinly fissile, mod. hard, sl. calc. to calc., sl. micaceous, medium grey	N5	0.88
		B 20% Shale, thinly fissile, mod. hard, non calc., greyish black Minor sandstone Minor lost circulation material metal and grease	N2	1.88
553-161	3506-515m	A 70% Shale, as 553-160A, minor cavings	N5	0.98
		B 20% Shale, as 553-160B, minor cavings	N2	1.70,1.64
		C 10% Sandstone, blocky, fine grained, subrounded to subangular, mostly quartz grains, some arg. material, non calc. cement, pinkish grey Minor lost circulation material - metal turnings	5YR8/1	
553-162	3515-524m	A 55% Shale, as 553-160A	N5	0.72
		B 30% Shale, as 553-160B	N2	1.62
		C 15% Sandstone, as 553-161C	5YR8/1	
553-163	3524-533m	A 50% Shale, as 553-160B	N2	1.88
		B 35% Shale, as 553-160A	N5	0.92
		C 15% Sandstone, as 553-161C	5YR8/1	
		Minor lost circulation material - mica		
553-164	3533-542m	A 60% Shale, fissile, mod. hard, non calc., dark grey	N3	1.46
		B 25% Shale, fissile to subfissile, mod. hard, calc., medium grey	N5	1.10
		C 15% Sandstone, as 553-161C	5YR8/1	
		Minor lost circulation material - metal turnings and mud		
553-165	3542-551m	A 50% Shale, as 553-164A	N3	1.76
		B 40% Sandstone, as 553-161C	5YR8/1	
		C 10% Shale, as 553-164B	N5	0.88
		Minor lost circulation material - metal turnings		
553-166	3551-560m	A 70% Shale, as 553-164A	N3	1.96
		B 30% Sandstone, as 553-161C	5YR8/1	
		Minor other shale Minor lost circulation material - drilling mud		
553-167	3560-569m	A 55% Shale, as 553-164A	N3	1.68
		B 35% Sandstone, as 553-161C	5YR8/1	
		C 10% Shale, as 553-164B	N5	0.88

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TABLE 2
ORGANIC CARBON RESULTS AND GROSS LITHOLOGIC DESCRIPTIONS

GEOCHEM SAMPLE NUMBER	DEPTH	GROSS LITHOLOGIC DESCRIPTION	G S A Colour Code	TOTAL ORGANIC CARBON (% of Rock)
553-168	3569-578m	A 65% Shale, fissile, mod. hard, non calc., dark grey, minor cavings	N3	1.68
		B 30% Sandstone, blocky, fine grained subrounded to subangular, mostly quartz grains, some arg. material, non calc. cement, pinkish grey	5YR8/1	
		C 5% Shale, fissile to subfissile, mod. hard, calc., mostly caved, medium grey	N5	0.74,0.78
		Minor lost circulation material - metal		
553-169	3578-587m	A 55% Shale, as 553-168A	N3	2.00
		B 45% Sandstone, as 553-168B	5YR8/1	
		Minor other shale		
553-170	3587-596m	A 75% Shale, subfissile to blocky, mod. hard, non calc., turbodrilled in parts, pale milky C., olive black	5Y2/1	1.06
		B 25% Shale, subfissile to blocky, mod. hard, sl. silty in part, sl. micaceous, non calc., medium grey	N5	0.82
		Minor other shale		
553-171	3596-605m	A 98% Shale, fissile to platy, mod. hard, non calc., dark grey	N3	1.34
		Minor other shale and sandstone mostly caved		
553-172	3605-614m	A 75% Shale, as 553-171A, minor cavings	N3	1.62
		B 20% Sandstone, blocky, fine grained, subrounded to subangular, mostly quartz, some arg. material, sl. calc. cement, white to pinkish grey	N9-5YR8/1	
		C 5% Shale, fissile, soft to mod. hard, sl. calc., mostly caved, medium grey to medium light grey	N5-N6	1.12
		Minor other shale, mud		
		Minor lost circulation material		
553-173	3614-623m	A 98% Shale, as 553-171A, mod. caved minor iron staining	N3	2.12
		Minor other shale and sandstone		
553-174	3623-632m	A 90% Shale, subfissile, platy in parts, sl. silty, mod. hard, non calc., mod. caved, medium dark grey	N4	1.58

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TABLE 2
ORGANIC CARBON RESULTS AND GROSS LITHOLOGIC DESCRIPTIONS

GEOCHEM SAMPLE NUMBER	DEPTH	GROSS LITHOLOGIC DESCRIPTION	G S A Colour Code	TOTAL ORGANIC CARBON (% of Rock)
553-174	3623-632m	B 10% Mudstone, subfissile, silty, soft to mod. hard, sl. micaceous, sl. calc., medium grey to medium light grey Minor other shale and sandstone mostly caved	N5-N6	0.78,0.76
553-175	3632-641m	A 98% Shale, subfissile, platy in parts, sl. silty, mod. hard, non calc., mod. caved, medium dark grey Minor other shale	N4	1.24
553-176	3641-650m	A 80% Shale, as 553-175A, mod. caved B 20% Shale, subfissile to blocky, muddy, soft to mod. hard, sl. calc., medium grey Minor other shale, mostly caved	N4 N5	1.26 0.76
553-177	3650-659m	A 95% Shale, as 553-175A, mod. caved B 5% Shale, as 553-176B Minor other shale	N4 N5	1.52 0.76
553-178	3659-668m	A 98% Shale, fissile to blocky, mod. hard, non calc., very dark olive grey Minor other shale Minor lost circulation material - mud	5Y3/1	1.10,1.06
553-179	3668-677m	A 98% Shale, as 553-178A, mod. caved Minor other shale, sandstone Minor lost circulation material - as mud	5Y3/1	2.18
553-180	3677-686m	A 98% Shale, fissile, platy, mod. hard, very sl. calc. to non calc., dark grey Minor other shale and sandstone Minor lost circulation material - drilling mud	N3	2.04
553-181	3686-695m	A 98% Shale, as 553-178A, mod. caved Minor other shale	5Y3/1	2.08
553-182	3695-704m	A 98% Shale, as 553-178A, mod. caved Minor other shale	5Y3/1	2.36
553-183	3704-713m	A 98% Shale, fissile to subfissile, mod. hard, non calc., minor cavings, dark grey to very dark olive grey Minor other shale	N3-5Y3/1	2.32

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ORGANIC CARBON RESULTS AND GROSS LITHOLOGIC DESCRIPTIONS

GEOCHEM SAMPLE NUMBER	DEPTH	GROSS LITHOLOGIC DESCRIPTION	G S A Colour Code	TOTAL ORGANIC CARBON (% of Rock)
553-184	3713-722m	A 98% Shale, fissile to subfissile, mod. hard, non calc., minor cavings, dark grey to very dark olive grey Minor other shale	N3-5Y3/1	2.80,2.72
553-185	3722-731m	A 98% Shale, as 553-184A, minor cavings Minor other shale	N3-5Y3/1	1.90
553-186	3731-740m	A 98% Shale, as 553-184A, minor cavings Minor other shale	N3-5Y3/1	1.74
553-187	3740-749m	A 98% Shale, as 553-184A, minor cavings Minor other shale	N3-5Y3/1	1.08
553-188	3749-758m	A 98% Shale, as 553-184A, minor cavings Minor other shale	N3-5Y3/1	1.32
553-189	3758-767m	A 98% Shale, as 553-184A, minor cavings Minor other shale	N3-5Y3/1	1.16,1.12
553-190	3767-776m	A 98% Shale, fissile to subfissile, mod. hard, non calc., minor cavings, olive black Minor other shale	5Y2/1	1.53
553-191	3776-785m	A 98% Shale, as 553-190A, minor cavings Minor other shale	5Y2/1	1.40,0.94
553-192	3785-794m	A 98% Shale, as 553-190A, minor cavings Minor other shale	5Y2/1	1.44
553-193	3794-803m	A 80% Shale, fissile to subfissile, mod. hard, non calc., minor cavings, medium dark grey to medium grey B 20% Lost circulation material - drilling mud and cement	N4-N5	1.24
553-194	3803-812m	A 65% Shaly Mudstone, fissile to blocky, mod. hard, sl. to non calc., medium dark grey B 35% Lost circulation material - cement and drilling mud	N4	0.99
553-195	3812-821m	A 80% Mudstone, blocky, soft, very sl. calc., oil stained, medium brownish grey B 15% Lost circulation material - cement, drilling mud and metal turnings C 5% Shale, fissile, mod. hard, non calc., minor cavings, dark olive grey Minor other shale	5YR5/1 5Y3/1	1.95 2.44

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TABLE 2
ORGANIC CARBON RESULTS AND GROSS LITHOLOGIC DESCRIPTIONS

GEOCHEM SAMPLE NUMBER	DEPTH	GROSS LITHOLOGIC DESCRIPTION	G S A Colour Code	TOTAL ORGANIC CARBON (% of Rock)
553-196	3821-830m	A 50% Shale, fissile, mod. hard, non hard, minor cavings, dark olive grey	5Y3/1	2.10
		B 35% Mudstone, blocky, soft, very sl. calc., oil stained, medium brownish grey	5YR5/1	2.20
		C 15% Lost circulation material - metal turnings, drilling mud		
		Minor other shale		
553-197	3830-839m	A 60% Shale, subfissile, mod. hard, very sl. calc. to non calc., turbo-drilled, medium dark grey	N4	1.70
		B 25% Mudstone, as 553-196B, oil stained	5YR5/1	2.51
		C 15% Shale, as 553-196A	5Y3/1	2.60
		Minor other shale		
		Minor lost circulation material - mud, metal turnings		
553-198	3839-848m	A 75% Shale, as 553-197A	N4	1.97
		B 20% Mudstone, as 553-196B, sl. oil stained	5YR5/1	2.32
		C 5% Shale, as 553-196A	5Y3/1	2.58
		Lost circulation material - metal turnings and mud		
553-199	3848-857m	A 85% Shale, as 553-197A	N4	1.82,1.75
		B 15% Mudstone, as 553-196B, sl. oil stained	5YR5/1	1.95
		Minor other shale, mostly caved		
		Lost circulation material - metal turnings and mud		
553-200	3857-866m	A 85% Shale, as 553-197A	N4	1.66
		B 15% Mudstone, as 553-196B	5YR5/1	2.00
		Minor other shale		
		Lost circulation material - metal turnings and mud		
553-201	3866-875m	A 55% Shale, as 553-197A	N4	1.99
		B 30% Sandstone, unconsolidated, fine grained, subrounded to subangular, mainly quartz, pinkish grey	5YR8/1	
		C 15% Mudstone, as 553-196B	5YR5/1	2.31
		Minor other shale		
		Lost circulation material - metal turnings and mud		
553-202	3875-884m	A 60% Shale, subfissile, mod. hard, sl. to non calc., turbodrilled in parts, medium dark grey	N4	2.07

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TABLE 2
ORGANIC CARBON RESULTS AND GROSS LITHOLOGIC DESCRIPTIONS

GEOCHEM SAMPLE NUMBER	DEPTH	GROSS LITHOLOGIC DESCRIPTION	G S A Colour Code	TOTAL ORGANIC CARBON (% of Rock)
553-202	3875-884m	B 40% Sandstone, unconsolidated, mostly quartz, fine grain, subrounded to subangular, pinkish grey Minor other shale and mudstone Lost circulation material - metal turnings	5YR8/1	
553-203	3884-893	A 70% Shale, subfissile, mod. hard, sl. calc. to non calc., turbodrilled in parts, medium dark grey	N4	0.94
		B 30% Sandstone, as 553-202B Minor other shale and mudstone Lost circulation material - metal turnings	5YR8/1	
553-204	3893-902m	A 80% Shale, as 553-203A	N4	1.74
		B 20% Sandstone, as 553-202B Minor other shale Lost circulation material - metal turnings	5YR8/1	
553-205	3902-911m	A 90% Shale, blocky, mod. hard, sl. calc., to non calc., turbodrilled in parts, dark grey	N3	0.90
		B 10% Sandstone, as 553-202B Minor other shale and mudstone Lost circulation material - metal turnings	5YR8/1	
553-206	3911-920m	A 90% Shale, as 553-205A	N3	1.21
		B 10% Sandstone, as 553-202B Minor other shale and mudstone Lost circulation material - metal turnings	5YR8/1	
553-207	3920-929m	A 98% Shale, as 553-205A Minor other shale, sandstone Lost circulation material - metal turnings	N3	1.54
553-208	3939-938m	A 98% Shale, as 553-205A Minor other shale and sandstone Lost circulation material - metal turnings	N3	1.47
553-209	3938-947m	A 98% Shale, as 553-205A Minor other shale Lost circulation material - metal turnings	N3	1.45,1.35

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TABLE 2
ORGANIC CARBON RESULTS AND GROSS LITHOLOGIC DESCRIPTIONS

GEOCHEM SAMPLE NUMBER	DEPTH	GROSS LITHOLOGIC DESCRIPTION	G S A Colour Code	TOTAL ORGANIC CARBON (% of Rock)
553-210	3947-956m	A 95% Shale, subfissile to blocky, mod. hard, sl. calc. to non calc., turbodrilled in parts, medium dark grey	N4	1.09
		B 5% Shale, subfissile, mod. hard, patchy vitreous lustre, non calc., greyish black to dark grey Minor other shale, mostly caved	N2-N3	2.58
553-211	3956-965m	A 85% Shale, as 553-210A	N4	1.44
		B 10% Sandstone, unconsolidated, mostly quartz, fine grained, subrounded to subangular, pinkish grey	5YR8/1	
		C 5% Shale, as 553-210B Minor other shale Lost circulation material - metal turnings	N2-N3	2.10
553-212	3965-974m	A 95% Shale, as 553-210A	N4	1.36
		B 5% Sandstone, as 553-211B Minor other shale Lost circulation material - metal turnings	5YR8/1	
553-213	3974-983m	A 90% Shale, platy, fissile, mod. hard, non calc., turbodrilled in part, dark grey	N3	1.88
		B 10% Sandstone, as 553-211B Minor other shale and mustone Lost circulation material - metal	5YR8/1	
553-214	3983-992m	A 95% Shale, as 553-213A	N3	1.80
		B 5% Sandstone, as 553-211B Minor other shale and mudstone Lost circulation material - metal turnings	5YR8/1	
553-215	3992-4001	A 95% Shale, as 553-213A, minor cavings	N3	1.41
		B 5% Sandstone, as 553-211B Minor other shale and mudstone Lost circulation material - metal turnings	5YR8/1	
553-216	4001-010m	A 90% Shale, fissile to subfissile, mod. hard, patchy vitreous lustre, non calc., turbodrilled in parts, sl. micaceous, minor cavings, very dark brownish grey	5YR3/1	2.68
		B 10% Sandstone, as 553-211B Minor other shale Lost circulation material - metal turnings	5YR8/1	

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TABLE 2
ORGANIC CARBON RESULTS AND GROSS LITHOLOGIC DESCRIPTIONS

GEOCHEM SAMPLE NUMBER	DEPTH	GROSS LITHOLOGIC DESCRIPTION	G S A Colour Code	TOTAL ORGANIC CARBON (% of Rock)
553-217	4010-019m	A 55% Shale, fissile to subfissile, mod. hard, patchy vitreous lustre, non calc., turbodrilled in parts, sl. micaceous, minor cavings, very dark brownish grey	5YR3/1	2.58
		B 45% Sandstone, platy, blocky, fine grained, subrounded to subangular, mostly quartz, non calc. cement, very light grey to white	N8-N9	
		Minor other shale		
		Lost circulation material - metal turnings		
553-218	4019-028m	A 80% Shale, as 553-217A, minor cavings	5YR3/1	2.38,2.40
		B 20% Sandstone, as 553-217B	N8-N9	
		Minor other shale		
		Lost circulation material - metal turnings		
553-219	4028-037m	A 85% Shale, as 553-217A, minor cavings	5YR3/1	2.96
		B 15% Sandstone, as 553-217B	N8-N9	
		Minor other shale		
		Lost circulation material - metal turnings		
553-220	4037-046m	A 75% Shale, as 553-217A, minor cavings	5YR3/1	2.80
		B 25% Sandstone, as 553-217B	N8-N9	
		Minor other shale		
		Lost circulation material - metal turnings		
553-221	4046-055m	A 90% Shale, subfissile to blocky, mod. hard, non calc., turbodrilled in parts, dark grey to medium grey	N3-N5	3.22
		B 10% Sandstone, as 553-217B	N8-N9	
		Minor other shale		
		Lost circulation material - metal turnings and mud		
553-222	4055-064m	A 70% Shale, as 553-221A	N3-N5	2.60
		B 30% Shale, subfissile, soft to mod. hard, non calc., medium light grey	N6	1.06
		Minor other shale, sandstone		
		Lost circulation material - metal turnings		
553-223	4064-073m	A 60% Shale, as 553-221A	N3-N5	2.92
		B 40% Shale, as 553-222B	N6	1.24
		Lost circulation material - metal turnings and mica		
		Minor other shale and sand		

Abbreviations = **argil**laceous, **calc**areous, **C**ut, **F**luorescence, **sl**ightly

TABLE 2
ORGANIC CARBON RESULTS AND GROSS LITHOLOGIC DESCRIPTIONS

GEOCHEM SAMPLE NUMBER	DEPTH	GROSS LITHOLOGIC DESCRIPTION	G S A Colour Code	TOTAL ORGANIC CARBON (% of Rock)
553-224	4073-082	A 75% Sand, unconsolidated, mostly quartz, some basic igneous fragments, subrounded, fine to medium grain, very light grey to white	N8-N9	
		B 25% Shale, subfissile to blocky, mod. hard, non calc., turbodrilled in parts, dark grey to medium grey, Minor other shale Lost circulation material - metal turnings and mica	N3-N5	3.99
553-225	4082-088m	A 85% Sand, as 553-224A	N8-N9	
		B 15% Shale, as 553-0224B, minor cavings Minor other shale Lost circulation material - metal turnings and mica	N3-N5	3.58

Abbreviations = **arg**illaceous, **calc**areous, **C**ut, Fluorescence, **sl**ightly

TABLE 3
DETAILED GASOLINE RANGE ($C_4 - C_7$) ANALYSIS

GEOCHEM SAMPLE NUMBER	-127	-158	-168	-173	-174	-181
DEPTH	3200-209m	3479-488m	3569-578m	3614-623m	3623-632m	3686-695m
isobutane	3.78	1.46	4.84	4.41	10.60	4.81
n - butane (nB)	19.35	4.19	5.62	27.43	6.54	18.47
isopentane	8.71	18.92	8.72	12.69	25.24	25.81
n - pentane (nP)	28.08	24.19	8.72	27.82	26.23	39.52
2,2 - dimethylB	0.07	0.08	1.74	0.13	0.14	0.04
cyclopentane (CP)	2.24	1.40	4.26	0.86	1.72	0.43
2,3 - dimethylB	0.02	0.38	0.58	0.43	2.65	0.03
2 - methylP	4.14	12.46	13.76	1.33	2.48	1.55
3 - methylP	2.14	8.17	7.75	1.20	1.75	0.83
n - hexane (nH)	3.55	4.17	6.20	2.82	2.85	1.38
methylCP (MCP)	4.98	2.33	2.52	1.59	1.92	1.61
2,2 - dimethylP	0.76	1.00	0.39	0.04	0.08	0.12
benzene	1.44	1.42	3.29	1.63	1.95	0.52
2,4 - dimethylP	0.24	0.08	0.19	0.04	0.08	0.01
2,2,3 - trimethylB	0.03	0.04	0.19	0.21	0.28	0.01
cyclohexane (CH)	3.86	2.00	3.29	2.01	2.37	1.08
3,3 - dimethylP	0.02	0.06	-	0.04	0.08	-
1,1 - dimethylCP	0.01	0.04	-	0.04	0.03	-
2 - methylH	0.48	1.83	2.71	2.01	1.04	0.42
2,3 - dimethylP	0.06	0.25	0.19	1.80	0.39	0.04
1,c,3 - dimethylCP	0.77	0.67	0.39	0.43	0.62	0.24
3 - methylH	1.10	1.67	2.13	2.23	0.93	0.34
1,t,3 - dimethylCP	0.81	0.71	0.39	0.43	0.65	0.27
1,t,2 - dimethylCP	2.00	1.48	1.55	1.41	1.07	0.50
3 - ethylP	0.01	0.04	-	0.21	0.14	-
n - heptane	2.39	4.52	6.78	1.93	2.54	0.44
1,c,2 - dimethylCP	0.57	0.17	-	0.64	0.65	0.02
methylCH (MCH)	5.99	4.23	7.95	3.00	3.86	1.43
toluene	2.38	2.06	5.81	1.16	1.10	0.08
ABUNDANCE (ppm)	243.72	240.00	1032.00	233.30	177.30	2518.00
MCP/benzene	3.46	1.65	0.76	0.97	0.99	3.07
MCP/MCH	0.83	0.55	0.32	0.53	0.50	1.12
CH/MCP	0.77	0.86	1.31	1.27	1.24	0.67
iP/nP	0.31	0.78	1.00	0.46	0.96	0.65
%n - PARAFFINS	53.37	37.06	27.33	60.01	38.16	59.81
% ISOPARAFFINS	21.56	46.44	43.22	26.79	45.91	34.01
% NAPHTHENES	21.25	13.02	20.35	10.42	12.89	5.58
% AROMATICS	3.82	3.48	9.11	2.79	3.05	0.60

NORMALISED COMPOSITION

TABLE 3
DETAILED GASOLINE RANGE ($C_4 - C_7$) ANALYSIS

GEOCHEM SAMPLE NUMBER	-183	-188	-192	-196	-199	-202
DEPTH	3704-713m	3749-758m	3785-794m	3821-830m	3848-857m	3875-884m
NORMALISED COMPOSITION						
isobutane	5.38	0.55	6.61	8.49	14.59	19.57
n - butane (nB)	21.80	1.30	13.83	22.33	39.80	22.21
isopentane	14.43	9.40	8.19	10.28	22.79	21.42
n - pentane (nP)	50.08	10.74	64.04	14.86	9.16	32.00
2,2 - dimethylB	0.01	0.15	0.04	0.05	0.02	0.13
cyclopentane (CP)	0.55	2.80	0.31	1.68	0.44	0.37
2,3 - dimethylB	0.02	0.09	0.03	0.02	0.06	0.03
2 - methylP	0.94	7.51	0.63	3.94	1.29	0.26
3 - methylP	0.44	4.43	0.36	2.08	1.94	0.06
n - hexane (nH)	0.87	4.29	0.43	6.01	1.26	0.38
methylCP (MCP)	1.21	4.38	0.69	4.47	1.17	0.48
2,2 - dimethylP	0.19	0.19	0.08	0.34	0.10	0.04
benzene	0.15	3.13	0.18	1.10	0.62	0.29
2,4 - dimethylP	0.01	0.05	-	0.01	0.02	-
2,2,3 - trimethylB	0.02	0.07	0.02	0.02	0.04	0.01
cyclohexane (CH)	0.89	10.08	0.73	4.90	0.91	0.52
3,3 - dimethylP	0.01	0.03	0.01	-	0.01	0.01
1,1 - dimethylCP	-	0.01	-	-	0.01	0.01
2 - methylH	0.24	3.52	0.29	1.92	0.45	0.19
2,3 - dimethylP	0.05	0.79	0.01	0.10	0.01	0.01
1,c,3 - dimethylCP	0.20	2.75	0.20	0.93	0.20	0.09
3 - methylH	0.23	3.14	0.27	1.83	0.43	0.16
1,t,3 - dimethylCP	0.19	2.26	0.20	0.86	0.18	0.10
1,t,2 - dimethylCP	0.50	6.31	0.51	1.77	0.64	0.22
3 - ethylP	-	0.03	-	-	0.04	0.01
n - heptane	0.33	2.75	0.38	3.44	0.88	0.33
1,c,2 - dimethylCP	0.02	0.19	0.03	0.04	0.12	0.02
methylCH (MCH)	1.08	17.52	1.76	7.46	2.03	0.93
toluene	0.13	1.53	0.18	1.03	0.79	0.16
ABUNDANCE (ppm)	4041.75	3042.33	4632.50	3121.80	2361.71	3008.32
MCP/benzene	7.90	1.40	3.92	4.06	1.90	1.64
MCP/MCH	1.13	0.25	0.39	0.60	0.58	0.52
CH/MCP	0.74	2.30	1.06	1.10	0.78	1.08
iP/nP	0.29	0.88	0.13	0.69	2.49	0.67
%n - PARAFFINS	73.08	19.09	78.67	46.64	51.11	54.92
% ISOPARAFFINS	21.98	29.94	16.55	29.10	41.79	41.89
% NAPHTHENES	4.65	46.30	4.43	22.13	5.70	2.74
% AROMATICS	0.28	4.67	0.35	2.14	1.40	0.45

TABLE 3
DETAILED GASOLINE RANGE ($C_4 - C_7$) ANALYSIS

GEOCHEM SAMPLE NUMBER	-210	-226
DEPTH	3947-956m	CONDENSATE
NORMALISED COMPOSITION		
isobutane	1.43	22.05
n - butane (nB)	10.93	43.01
isopentane	4.16	6.92
n - pentane (nP)	6.81	11.14
2,2 - dimethylB	0.29	0.22
cyclopentane (CP)	1.18	0.74
2,3 - dimethylB	0.12	0.67
2 - methylP	6.57	1.58
3 - methylP	3.02	0.78
n - hexane (nH)	6.28	2.33
methylCP (MCP)	6.28	1.36
2,2 - dimethylP	0.20	0.04
benzene	0.98	1.28
2,4 - dimethylP	0.04	0.01
2,2,3 - trimethylB	0.04	-
cyclohexane (CH)	6.69	2.25
3,3 - dimethylP	-	-
1,1 - dimethylCP	-	-
2 - methylH	9.50	0.34
2,3 - dimethylP	-	-
1,c,3 - dimethylCP	1.47	0.07
3 - methylH	8.32	0.19
1,t,3 - dimethylCP	1.18	0.04
1,t,2 - dimethylCP	3.87	0.12
3 - ethylP	-	-
n - heptane	12.72	0.58
1,c,2 - dimethylCP	0.08	0.03
methylCH (MCH)	7.06	1.20
toluene	0.77	0.74
ABUNDANCE (ppm)	2452.00	-
MCP/benzene	6.42	1.06
MCP/MCH	0.89	1.14
CH/MCP	1.06	1.65
iP/nP	0.61	0.89
%n - PARAFFINS	36.75	57.01
% ISOPARAFFINS	33.69	35.16
% NAPHTHENES	27.81	5.81
% AROMATICS	1.75	2.02

TABLE 4

VISUAL KEROGEN DATA

GEOCHEM SAMPLE NUMBER	DEPTH	ORGANIC MATTER DESCRIPTION				THERMAL MATURATION INDEX
		TYPES	REMARKS	PARTICLE SIZE	PRESERV-ATION	
553-080	2470-490m	I;Al;W-Am-H	lean, unreliable.	F-M	P	1+ to 2-(?)
553-108	3010-020m	Am*;-;I-W-H-Al	H at 2- to 2. *dark, atypical, incompletely developed.	F-M	P	2-(?)
553-118	3110-120m	Am*;-;I-W-Al-H	*poor quality, dispersed, incompletely developed.	F-M	P	2-(?)
553-128A	3209-218m	I;W-H;Al	H at 2-. Disseminated Am-like material.	M	F	2- to 2 max.
553-144	3353-362m	I;-;W-Al-H		M	F	2- to 2
553-151	3416-425m	I;W-Al;H-Am	disseminated Am-like material.	M	P	2- to 2
553-158A	3479-488m	I;W;Al-H-Am	disseminated Am-like material.	F-M	F	2- to 2
553-165A	3542-551m	I;W;Al-H		M	F	2- to 2
553-175	3632-641m	I;W;Al-H	disseminated Am-like material.	M	F	2- to 2
553-181	3686-695m	Am*;Al-I-W;H	*poor quality, dispersed, incompletely developed.	F-M	P	2- to 2(?)
553-187	3740-749m	Am*;I-Al-W;H	*dark, grainy, not prime quality.	M	F	2- to 2
553-199	3848-857m	Am*;-;Al-I-W-H	*dark, incompletely developed, poor quality.	F-M	P-F	2- to 2
553-211	3956-965m	Am*;-;Al-I-W	*grainy, atypical, poor quality.	F-M	P	2- to 2(?)
553-223	4064-073m	Al-I-W;-;Am-H	disseminated Am-like material.	M	P	2- to 2(?)

Algal, Amorphous, Coaly, Herbaceous, Stem, Woody.

TABLE 5A

WEIGHT (GRAMMES) OF C_{15+} EXTRACTS AND CHROMATOGRAPHIC FRACTIONS

GEOCHEM SAMPLE NUMBER	INTERVAL	ROCK EXTRACTED	TOTAL EXTRACT OBTAINED	TOTAL EXTRACT		nC_5 SOLUBLE FRACTION				
				Preciptd. Asphaltenes	nC_5 soluble	Paraffin – Naphthenes	Aromatics	Eluted NSO's	Non-eluted NSO's	Sulphur
553-080	2470-2490	8.7000	0.00645	0.00312	0.00333	0.00146	0.00078	0.00080	0.00029	0.00000
553-092	2710-2730	6.6500	0.00616	0.00230	0.00386	0.00145	0.00106	0.00071	0.00064	0.00000
553-108	3010-3020	7.9200	0.00615	0.00331	0.00284	0.00116	0.00053	0.00109	0.00006	0.00000
553-118	3110-3120	11.7900	0.00718	0.00367	0.00351	0.00095	0.00096	0.00089	0.00071	0.00000
553-128	3209-3218	14.7700	0.00834	0.00493	0.00341	0.00119	0.00119	0.00086	0.00017	0.00000
553-144	3353-3362	11.0400	0.01085	0.00300	0.00785	0.00319	0.00246	0.00158	0.00062	0.00000
553-151	3416-3425	8.8200	0.01352	0.00248	0.01104	0.00516	0.00276	0.00290	0.00022	0.00000
553-165	3542-3551	9.5700	0.00621	0.00232	0.00389	0.00099	0.00133	0.00128	0.00029	0.00000
553-175	3632-3641	10.0200	0.00582	0.00260	0.00322	0.00107	0.00128	0.00071	0.00016	0.00000
553-181	3686-3695	11.5000	0.01045	0.00446	0.00599	0.00215	0.00247	0.00123	0.00014	0.00000
553-187	3740-3749	11.6000	0.01249	0.00593	0.00656	0.00231	0.00256	0.00145	0.00024	0.00000
553-199	3848-3857	9.9200	0.01510	0.00651	0.00859	0.00323	0.00346	0.00168	0.00022	0.00000
553-211	3956-3965	7.3200	0.01798	0.01279	0.00519	0.00164	0.00218	0.00127	0.00010	0.00000
553-223	4064-4073	12.3900	0.01943	0.01099	0.00844	0.00247	0.00309	0.00260	0.00028	0.00000

TABLE 5B

CONCENTRATION (PPM) OF EXTRACTED C_{15+} MATERIAL IN ROCK

GEOCHEM SAMPLE NUMBER	INTERVAL	TOTAL EXTRACT	HYDROCARBONS			NON HYDROCARBONS				
			Paraffin – Naphthenes	Aromatics	TOTAL	Preciptd. Asphaltenes	Eluted NSO's	Non-eluted NSO's	Sulphur	TOTAL
553-080	2470-2490	741	168	90	257	359	92	33	0	484
553-092	2710-2730	926	218	159	377	346	107	96	0	549
553-108	3010-3020	777	146	67	213	418	138	8	0	563
553-118	3110-3120	609	81	81	162	311	75	60	0	447
553-128	3209-3218	565	81	81	161	334	58	12	0	404
553-144	3353-3362	983	289	223	512	272	143	56	0	471
553-151	3416-3425	1533	585	313	898	281	329	25	0	635
553-165	3542-3551	649	103	139	242	242	134	30	0	406
553-175	3632-3641	581	107	128	235	259	71	16	0	346
553-181	3686-3695	909	187	215	402	388	107	12	0	507
553-187	3740-3749	1077	199	221	420	511	125	21	0	657
553-199	3848-3857	1522	326	349	674	656	169	22	0	848
553-211	3956-3965	2456	224	298	522	1747	173	14	0	1934
553-223	4064-4073	1568	199	249	449	887	210	23	0	1119

TABLE 5C

COMPOSITION (NORMALISED %) OF C_{15+} MATERIAL EXTRACTED FROM ROCK

GEOCHEM SAMPLE NUMBER	INTERVAL	HYDROCARBONS			NON HYDROCARBONS					HC / NON HC
		Paraffin – Naphthenes	Aromatics	P – N / AROM	Preciptd. Asphaltenes	Eluted NSO's	Non eluted NSO's	Sulphur	ASPH / NSO	
553-080	2470-2490	22.64	12.09	1.87	48.37	12.40	4.50	0.00	2.86	0.53
553-092	2710-2730	23.54	17.21	1.37	37.34	11.53	10.39	0.00	1.70	0,69
553-108	3010-3020	18.86	8.62	2.19	53.82	17.72	0.98	0.00	2.88	0.38
553-118	3110-3120	13.23	13.37	0.99	51.11	12.40	9.89	0.00	2.29	0.36
553-128	3209-3218	14.27	14.27	1.00	59.11	10.31	2.04	0.00	4.79	0.40
553-144	3353-3362	29.40	22.67	1.30	27.65	14.56	5.71	0.00	1.36	1.09
553-151	3416-3425	38.17	20.41	1.87	18.34	21.45	1.63	0.00	0.79	1.41
553-165	3542-3551	15.94	21.42	0.74	37.36	20.61	4.67	0.00	1.48	0.60
553-175	3632-3641	18.38	21.99	0.84	44.67	12.20	2.75	0.00	2.99	0.68
553-181	3686-3695	20.57	23.64	0.87	42.68	11.77	1.34	0.00	3.26	0.79
553-187	3740-3749	18.49	20.50	0.90	47.48	11.61	1.92	0.00	3.51	0.64
553-199	3848-3857	21.39	22.91	0.93	43.11	11.13	1.46	0.00	3.43	0.80
553-211	3956-3965	9.12	12.12	0.75	71.13	7.06	0.56	0.00	9.34	0.27
553-223	4064-4073	12.71	15.90	0.80	56.56	13.38	1.44	0.00	3.82	0.40

TABLE 6

SIGNIFICANT RATIOS (%) OF C_{15+} FRACTIONS AND ORGANIC CARBON

GEOCHEM SAMPLE NUMBER	DEPTH	ORGANIC CARBON	HYDROCARBONS / TOTAL EXTRACT	HYDROCARBONS / ORGANIC CARBON	TOTAL EXTRACT / ORGANIC CARBON
553-080	2470-2490	0.59	34.73	4.36	12.57
553-092	2710-2730	0.47	40.75	8.03	19.71
553-108	3010-3020	0.63	27.48	3.39	12.33
553-118	3110-3120	0.74	26.60	2.19	8.23
553-128	3209-3218	0.68	28.54	2.37	8.30
553-144	3353-3362	0.54	52.07	9.48	18.20
553-151	3416-3425	0.75	58.58	11.97	20.44
553-165	3542-3551	0.50	37.36	4.85	12.98
553-175	3632-3641	0.77	40.38	3.05	7.54
553-181	3686-3695	0.98	44.21	4.10	9.27
553-187	3740-3749	1.11	38.99	3.78	9.70
553-199	3848-3857	1.67	44.30	4.04	9.11
553-211	3956-3965	0.81	21.25	6.44	30.32
553-223	4064-4073	1.33	28.62	3.37	11.79

TABLE 7

PYROLYSIS ANALYSIS

SAMPLE NUMBER	DEPTH	ORGANIC CARBON	PPM BITUMEN*	PPM PYROLYSATE+	PYROLYSATE / ORGANIC CARBON	BITUMEN / PYROLYSATE
553-080	2470-2490	0.74	295	192	0.03	1.538
553-092	2710-2730	1.56	931	129	0.01	7.188
553-108	3010-3020	0.54	364	95	0.02	3.833
553-112	3050-3060	0.70	355	54	0.01	6.600
553-116	3090-3100	0.92	266	153	0.02	1.739
553-118	3110-3120	1.06	882	211	0.02	4.187
553-122	3150-3160	0.70	207	1278	0.18	0.162
553-126	3190-3200	0.94	281	1974	0.21	0.142
553-128	3209-3218	0.92	32	498	0.05	0.063
553-130	3227-3236	0.56	191	165	0.03	1.154
553-134	3263-3272	0.90	75	1245	0.14	0.060
553-136	3281-3290	1.10	320	630	0.06	0.509
553-140	3317-3326	0.60	109	1245	0.21	0.088
553-142	3335-3344	1.64	792	861	0.05	0.921
553-144	3353-3362	1.64	128	810	0.05	0.158
553-146	3371-3380	0.90	388	313	0.03	1.240
553-148	3389-3398	0.62	133	181	0.03	0.735
553-151	3416-3425	0.98	832	527	0.05	1.578
553-158	3479-3488	0.80	267	356	0.04	0.750
553-165	3542-3551	1.76	158	803	0.05	0.197
553-167	3560-3569	1.68	199	2054	0.12	0.097
553-169	3578-3587	2.00	59	995	0.05	0.059
553-171	3596-3605	1.34	197	2511	0.19	0.079
553-172	3605-3614	1.66	50	778	0.05	0.065
553-173	3614-3623	2.12	217	1190	0.06	0.182
553-175	3632-3641	1.24	176	1882	0.15	0.093
553-177	3650-3659	1.52	442	5837	0.38	0.076
553-179	3668-3677	2.18	406	1516	0.07	0.268
553-181	3686-3695	2.08	194	2054	0.10	0.095
553-183	3704-3713	2.32	114	1340	0.06	0.085

TABLE 7

PYROLYSIS ANALYSIS

SAMPLE NUMBER	DEPTH	ORGANIC CARBON	PPM BITUMEN*	PPM PYROLYSATE+	PYROLYSATE / ORGANIC CARBON	BITUMEN / PYROLYSATE
553-185	3722-3731	1.90	380	1069	0.06	0.356
553-187	3740-3749	1.07	165	1027	0.10	0.160
553-189	3758-3767	1.16	84	657	0.06	0.128
553-191	3776-3785	1.40	53	356	0.03	0.149
553-193	3794-3803	1.24	612	1565	0.13	0.391
553-195	3812-3821	1.95	423	4395	0.23	0.096
553-197	3830-3839	1.70	152	1822	0.11	0.083
553-199	3848-3857	1.82	1007	1084	0.06	0.929
553-203	3884-3893	0.94	513	290	0.03	1.765
553-205	3902-3911	0.90	1385	2317	0.26	0.598
553-207	3920-3929	1.54	241	1591	0.10	0.151
553-209	3938-3947	1.45	693	1431	0.10	0.484
553-211	3956-3965	1.44	256	1636	0.11	0.156
553-213	3974-3983	1.88	246	1951	0.10	0.126
553-215	3992-4001	1.41	109	1052	0.07	0.104
553-217	4014-4019	2.58	264	2790	0.11	0.095
553-221	4046-4055	1.16	404	4214	0.36	0.096
553-223	4064-4073	2.92	273	3096	0.11	0.088

*50-340°C

+350-550°C

TABLE 8

COMPOSITION (NORMALISED %) OF C_{15+} PARAFFIN – NAPHTHENE HYDROCARBONS

GEOCHEM SAMPLE NUMBER	-080	-092	-108	-118	-128	-144
DEPTH	2470-490m	2710-730m	3010-020m	3110-120m	3209-218m	3353-362m
SAMPLE TYPE						
nC_{15}	8.51	13.65	20.31	9.30	18.05	8.03
nC_{16}	13.44	15.48	20.05	13.40	17.59	11.67
nC_{17}	17.25	16.86	19.53	14.30	17.24	10.90
nC_{18}	15.57	14.22	12.37	14.50	12.76	10.48
nC_{19}	12.77	10.21	8.98	11.20	8.39	9.55
nC_{20}	9.29	7.57	6.12	9.60	6.90	7.86
nC_{21}	6.49	5.16	4.17	6.60	4.60	7.27
nC_{22}	4.37	3.90	2.73	5.10	3.22	6.59
nC_{23}	2.91	2.75	1.95	3.60	2.53	6.09
nC_{24}	2.02	2.06	1.30	2.70	1.95	5.41
nC_{25}	1.79	1.49	0.91	2.00	1.72	4.82
nC_{26}	1.34	1.38	0.52	1.60	1.26	3.80
nC_{27}	1.01	1.15	0.39	1.30	1.15	2.96
nC_{28}	0.90	0.92	0.26	1.10	0.80	1.94
nC_{29}	0.67	0.80	0.13	0.90	0.57	1.27
nC_{30}	0.78	0.69	0.13	0.80	0.46	0.51
nC_{31}	0.56	0.46	0.13	0.60	0.23	0.42
nC_{32}	0.11	0.46	-	0.50	0.23	0.25
nC_{33}	0.11	0.34	-	0.40	0.11	0.08
nC_{34}	0.11	0.23	-	0.30	0.11	0.08
nC_{35}	-	0.23	-	0.20	0.11	-
PARAFFIN	55.88	50.03	63.58	42.86	55.77	51.80
ISOPRENOID	6.26	5.28	7.04	4.37	7.05	3.98
NAPHTHENE	37.86	44.69	29.39	52.76	37.18	44.22
CPI INDEX A	1.07	0.99	1.12	1.00	1.07	1.04
CPI INDEX B	1.04	0.95	-	0.99	1.08	1.13
PRISTANE/PHYTANE	0.85	0.88	1.07	1.00	1.62	2.25
PRISTANE/nC_{17}	0.30	0.29	0.29	0.36	0.45	0.49

TABLE 8

COMPOSITION (NORMALISED %) OF C_{15+} PARAFFIN – NAPHTHENE HYDROCARBONS

GEOCHEM SAMPLE NUMBER	-151	-165	-175	-181	-187	-199
DEPTH	3416-425m	3542-551m	3632-641m	3686-695m	3740-749m	3848-857m
SAMPLE TYPE						
nC_{15}	9.56	11.11	9.77	12.37	12.53	13.65
nC_{16}	9.68	13.24	17.61	17.22	16.16	16.59
nC_{17}	9.37	14.40	20.36	18.62	17.68	14.30
nC_{18}	8.74	12.56	16.51	16.45	13.82	12.23
nC_{19}	7.93	9.37	13.89	13.52	11.71	9.50
nC_{20}	6.87	7.83	8.53	9.06	7.96	6.22
nC_{21}	7.06	5.89	5.23	4.85	5.04	4.59
nC_{22}	6.18	4.73	3.16	3.32	3.98	3.60
nC_{23}	6.18	3.96	2.20	2.04	2.93	3.28
nC_{24}	5.87	3.48	1.24	1.40	2.11	2.73
nC_{25}	5.37	3.09	0.69	0.77	1.99	2.73
nC_{26}	4.25	2.61	0.28	0.38	1.29	2.51
nC_{27}	3.75	2.03	0.14	-	1.17	2.40
nC_{28}	2.81	1.64	0.14	-	0.70	1.75
nC_{29}	2.56	1.26	0.14	-	0.47	1.53
nC_{30}	1.94	0.77	0.14	-	0.23	1.20
nC_{31}	1.06	0.68	-	-	0.12	0.66
nC_{32}	0.44	0.48	-	-	0.12	0.22
nC_{33}	0.19	0.39	-	-	-	0.11
nC_{34}	0.12	0.29	-	-	-	0.11
nC_{35}	0.06	0.19	-	-	-	0.11
PARAFFIN	69.94	39.55	46.72	43.29	53.08	51.66
ISOPRENOID	3.84	4.09	7.13	7.01	7.27	6.77
NAPHTHENE	26.21	56.36	46.14	49.70	39.65	41.57
CPI INDEX A	1.07	1.00	1.17	-	1.05	1.04
CPI INDEX B	1.10	1.06	-	-	1.23	1.09
PRISTANE/PHYTANE	2.83	1.14	1.27	1.49	1.60	2.87
PRISTANE/nC_{17}	0.43	0.38	0.42	0.52	0.48	0.68

TABLE 8

COMPOSITION (NORMALISED %) OF C_{15+} PARAFFIN – NAPHTHENE HYDROCARBONS

GEOCHEM SAMPLE NUMBER	-211	-223	-226
DEPTH	3956-965m	4064-073m	CONDENSATE
SAMPLE TYPE			
nC_{15}	9.37	11.11	7.26
nC_{16}	14.46	14.50	12.31
nC_{17}	14.66	14.22	13.30
nC_{18}	14.76	12.71	13.61
nC_{19}	12.76	10.83	10.32
nC_{20}	10.17	8.76	8.56
nC_{21}	6.88	7.16	7.49
nC_{22}	5.18	5.37	6.42
nC_{23}	3.99	5.08	5.66
nC_{24}	2.79	3.39	4.43
nC_{25}	2.29	2.73	3.29
nC_{26}	1.20	1.79	2.52
nC_{27}	0.70	1.22	1.99
nC_{28}	0.30	0.56	1.30
nC_{29}	0.10	0.38	0.76
nC_{30}	0.10	0.09	0.46
nC_{31}	0.10	0.09	0.15
nC_{32}	0.10	-	0.08
nC_{33}	0.10	-	0.08
nC_{34}	-	-	-
nC_{35}	-	-	-
PARAFFIN	47.60	56.88	68.52
ISOPRENOID	6.41	6.32	4.56
NAPHTHENE	45.99	36.80	26.93
CPI INDEX A	1.09	1.15	1.05
CPI INDEX B	1.30	-	1.07
PRISTANE/PHYTANE	2.07	2.37	2.78
PRISTANE/nC_{17}	0.62	0.55	0.37

BRIEF DESCRIPTION OF THE ANALYSES PERFORMED BY GEOCHEM

"Screen Analyses" are described in sections A, C and D, "Sample Preparation" in section B, "Follow-up Analyses" in sections E through K and "Correlation Studies" in section L. The analyses can be run on either core or cuttings material with the proviso that samples must be canned for the C_1-C_7 analysis and should be canned (or at least wet) for the C_4-C_7 analysis. The other analyses can be run on both canned and bagged samples.

A) C_1-C_7 LIGHT HYDROCARBON ANALYSIS

The abundance and composition of the C_1-C_7 hydrocarbons in sediments reflects their source richness, maturity and the character of the hydrocarbons they can yield. Most importantly, it is extremely sensitive to the presence of migrated hydrocarbons and is an excellent method for their detection. As it provides the information on most of the critical parameters and is also economical, this analysis is excellent for screening samples to decide which of them merit further analysis.

During the time which elapses betwwen the collection of the sample at the wellsite and its analysis in the laboratory, a fraction of the total gas passes from the rock to the air space at the top of the can. For this reason, both the air space and the cuttings are analysed.

The analysis involves the gas chromatographic separation of the individual C_1-C_4 gaseous hydrocarbons (methane, ethane, propane, isobutane and normal butane) and a partial resolution of the C_5-C_7 gasoline-range hydrocarbons (for their complete resolution see Section E). The ppm abundance of the five gases and of the total C_5-C_7 hydrocarbons are calculated from their electronically integrated peak areas (not from peak height) by comparison with a standard.

In the report, the following data are tabulated: the abundance and composition of the air space gas, of the cuttings gas and of the combined air space and cuttings gases. The combined results are also presented graphically.

B) SAMPLE WASHING AND HAND PICKING

All of the analyses described in subsequent sections are run on washed and hand picked samples.

Cuttings are washed to remove the drilling mud, care being taken not to remove soft clays and fine sand during the washing procedure. Using the C_1-C_7 hydrocarbon data profile of the well, or the organic carbon profile (if this analysis is used for screening), electric logs (if supplied) and the appearance of the cuttings under the binocular microscope, samples are selected to represent the lithological and geochemical zones penetrated by the well. These samples are then carefully hand picked and the lithology of the uncaved material is described. It is these samples which are submitted for further analysis.

Sample material remaining after analysis is retained for six months. Unless instructions are received to the contrary, Geochem Laboratories may then destroy the samples.

Our reports incorporate a gross lithological description of all the samples which have been analysed and litho percentage logs. As screen analyses are recommended at narrow intervals, a complete lithological profile is obtained.

C) ORGANIC CARBON ANALYSIS

The organic carbon content of a rock is a measure of its total organic richness. Combined with the visual kerogen, C_1-C_7, C_4-C_7, pyrolysis and C_{15+} analyses, the organic carbon content is used to evaluate the potential (not necessarily actual) hydrocarbon source richness of the sediment. This analysis is an integral part of a total evaluation and it can also be used as an economical screen analysis for dry samples (when the C_1-C_7 analysis cannot be used).

Hand picked samples are dried, crushed and then acidised to remove the inorganic calcium and magnesium carbonates. The actual analysis involves combustion in a Leco carbon analyser. Blanks, standards and duplicates are run routinely for purposes of quality control at no extra cost to the client.

The data are tabulated and presented diagramatically in our reports in a manner which facilitates comparison with the gross lithology (see Section B) of the samples.

D) MINI-PYROLYSIS

An ideal screen analysis which provides a definitive measure of potential source richness upon those samples whose organic carbon contents suggest fair or good source potential. This is described in detail in section K.

E) DETAILED C_4-C_7 HYDROCARBON ANALYSIS

The abundance and composition of the C_4-C_7 gasoline-range hydrocarbons in sediments reflects their source quality, level of thermal maturation and organic facies. In addition, the data also reveal the presence of migrated hydrocarbons and can be used for crude oil-parent source rock correlation studies.

This powerful analysis, performed upon hand picked lithologies, is employed as a follow-up to confirm the potential of samples which have been selected using the initial screen analysis. It is used in conjunction with the organic carbon, visual kerogen and C_{15+} analyses.

The individual normal paraffins, isoparaffins, naphthenes and aromatics with between four and seven carbon atoms in the molecule (but also including toluene) are resolved by capillary gas chromatography and their peak areas electronically integrated.

Normalised compositions, selected ratios and the ppm abundance of the total gasoline-range fraction are tabulated in the report and also presented graphically.

F) KEROGEN TYPE AND MATURATION

Kerogen is the insoluble organic matter in rocks. Visual examination of the kerogen gives a direct measure of thermal maturity and of the composition of the organic matter (organic facies) and indicates the source quality of the sediment - which is confirmed using the organic carbon, light hydrocarbon, pyrolysis and C_{15+} analyses.

The type of hydrocarbon (oil or gas) generated by a source rock is a function of the types and level of thermal maturation of the organic matter which are present. Both of these parameters are measured directly by this method.

Kerogen is separated from the inorganic rock matrix by acid digestion and flotation methods which avoid oxidation of the organic matter. It is then mounted on a glass slide and examined at high and low magnifications with a Leitz microscope. Chemical methods measure the total kerogen population but, with this technique, individual particles can be selected for examination and spurious material identified. This is particularly valuable in reworked, contaminated and turbodrilled sediments.

The following data are generated: the types of organic matter present and their relative abundances, an estimate of the proportion of reworked material, preservation state, the thermal maturity of the non-reworked organic matter using the spore colouration technique.

Our maturation scale has been developed to digitise small but recognisable changes in organic matter colouration resulting from increasing maturity and to place particular emphasis upon the immature to mature transition. In the absence of a universal colouration scale, the most significant points on our scale have been calibrated against equivalent vitrinite reflectance values. The following maturation stages are recognised at the low end of the scale:-

a) immature; thermal index less than 2- (0.45% Ro)
b) marginally mature; indices between 2- and 2. Minor hydrocarbon generation from amorphous and herbaceous (± algal) organic matter
c) mature; indices between 2 (0.53% Ro) and 2 to 2+ (0.72% Ro), significant generation from amorphous, algal and herbaceous organic matter but wood only marginally mature
d) oil window; indices of 2 to 2+ (0.72% Ro) through to 3 (1.2% Ro). Peak hydrocarbon generation.

The condensate zone starts at a thermal index of 3 whilst indices of 3+ (2.0% Ro) and higher indicate the eometamorphic dry gas stage.

A total of fourteen types of organic matter are sought based upon the major categories of algal, amorphous, herbaceous (spore, pollen, cuticle), wood, inertinite and resin. This detail is essential for a proper understanding of hydrocarbon source potential as the different sub-groups within each category have different properties.

Upon completion of the study, the kerogen slides are sent to the client.

G) VITRINITE REFLECTANCE

Vitrinite reflectance is an alternative/confirmatory method for evaluating thermal maturation which is used in conjection with the visual kerogen analysis. The reflectivity of vitrinite macerals increases in response to thermal alteration and is used to define maturation levels and, by projection, to predict maturity at depth or the thicknesses of section removed by erosion.

Measurements are made upon kerogen separations in conjunction with polished whole rock samples. In general, this analysis is performed upon the same samples as the visual kerogen analysis, thus facilitating a direct comparison of the two sets of results.

If possible, forty to fifty measurements are taken per sample - unless the sediments are organically lean, vitrinite is sparse or only a single uniform population is present. The data are plotted in a histogram which distinguishes the indigenous vitrinite from possible reworked or caved material. Averages are calculated for each population. Comments upon exinite fluorescence and upon the character of the phytoclasts are noted on the histograms. The reports contain the tabulated data, histograms and the reflectivities plotted against depth.

The vitrinite and visual kerogen techniques provide mutually complementary information upon maturity, organic matter type and diagenesis.