Title:
Geochemical Trade Data Report **Well 7220/8-1 - Skrugard**

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Author(s)/Source(s): **Jorunn Johannesen, Marian Våge**
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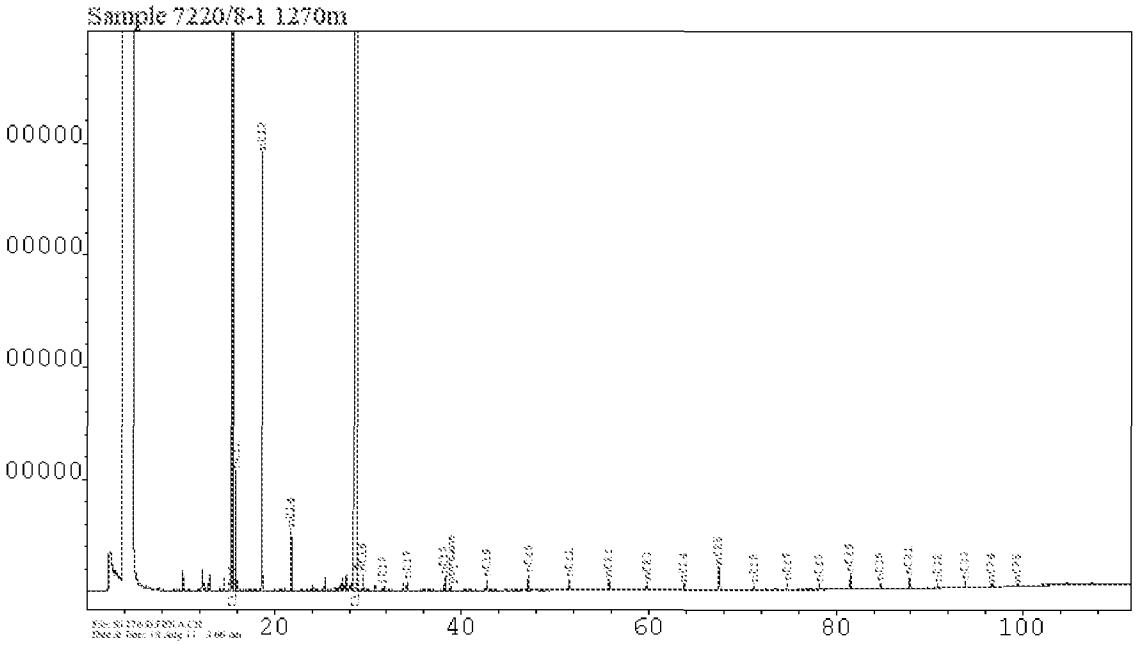
Mudsystem

The mud system used in the Skrugard well was KCl/Polymer/Glycol mud. The mud was used through the 8 ½" section (850-1252m) and 6" section (1251-2222m TD).



Rock Eval data

Well	Top-Depth (m)	Base-Depth (m)	Type	Lith	TOC (%)	S1 (kg/t)	S2 (kg/t)	S3 (kg/t)	T-max (°C)	HI (mg/g TOC)	OI (mg/g TOC)	PI (S1/S1+S2)
NO 7220/8-1	860	860	MUD		1.46	9.81	1.3	7.67	269	89	525	0.88
NO 7220/8-1	1221	1224	DC	Clst	1.32	1.43	1.97	0.61	333	149	46	0.42
NO 7220/8-1	1227	1230	DC	Clst	1.7	1.59	3.63	1.05	340	214	62	0.30
NO 7220/8-1	1236	1239	DC	Clst	1.44	1.79	3.74	1.9	348	260	132	0.32
NO 7220/8-1	1248	1251	DC	Clst	0.83	1.39	2.51	1.96	343	302	236	0.36
NO 7220/8-1	1251	1252	DC	Clst	0.78	1.09	1.63	0.87	338	209	112	0.40
NO 7220/8-1	1252	1255	DC	Clst	1.38	0.71	4.96	4.34	344	359	314	0.13
NO 7220/8-1	1252	1252	DC		0.78	1.09	1.63	0.87	338	209	112	0.40
NO 7220/8-1	1255	1258	DC	Clst	3.25	0.95	7.3	6.55	427	225	202	0.12
NO 7220/8-1	1255	1255	DC		1.38	0.71	4.96	4.34	344	359	314	0.13
NO 7220/8-1	1258	1258	DC		3.25	0.95	7.3	6.55	427	225	202	0.12
NO 7220/8-1	1261	1264	DC	Clst	2.05	1.06	5.16	2.67	341	252	130	0.17
NO 7220/8-1	1267	1270	DC	Clst	1.84	1.51	4.55	2	340	247	109	0.25
NO 7220/8-1	1270	1270	MUD		1.43	10.7	1.07	4.58	314	75	320	0.91
NO 7220/8-1	1273	1276	DC	Clst	1.94	1.25	5.59	2.62	356	288	135	0.18
NO 7220/8-1	1276	1279	DC	Clst	1.68	1.4	4.43	1.89	352	264	113	0.24
NO 7220/8-1	1300.53	1300.53	COCH		0.24	0.59	0.46	0.55	307	192	229	0.56
NO 7220/8-1	1309.6	1309.6	COCH		0.51	1.66	1.18	0.53	424	231	104	0.58
NO 7220/8-1	1314.7	1314.7	COCH		1.6	12.79	3.07	0.26	297	192	16	0.81
NO 7220/8-1	1318.5	1318.5	COCH		3.41	34.07	5.38	0.49	288	158	14	0.86
NO 7220/8-1	1329.75	1329.75	COCH		3.74	36.88	6.66	0.5	293	178	13	0.85
NO 7220/8-1	1339.9	1339.9	COCH		2.97	29.38	4.32	1.21	290	145	41	0.87
NO 7220/8-1	1350.9	1350.9	COCH		2.38	23.53	3.13	0.96	289	132	40	0.88
NO 7220/8-1	1360.35	1360.35	COCH		4.62	46.42	9.7	0.42	289	201	9	0.83
NO 7220/8-1	1370.45	1370.45	COCH		2.27	20.7	4.37	0.38	291	193	17	0.83
NO 7220/8-1	1385.7	1385.7	COCH		1.95	18.99	2.77	0.34	285	142	17	0.87
NO 7220/8-1	1393.65	1393.65	COCH		1.16	9.38	1.98	0.4	295	171	34	0.83
NO 7220/8-1	1398.8	1398.8	COCH		1.95	18.69	2.74	0.43	286	141	22	0.87
NO 7220/8-1	1400.65	1400.65	COCH		0.24	0.17	0.44	0.86	313	183	358	0.28
NO 7220/8-1	1403.3	1403.3	COCH		0.15	0.5	0.36	0.82	284	240	547	0.58
NO 7220/8-1	1405	1405	MUD		1.38	9.96	1.05	4.94	311	76	358	0.90
NO 7220/8-1	2210	2210	MUD		1.29	7.84	1.38	4.52	397	107	350	0.85
SJ SR1	1	725.11	OC		2.3	1.11	5.97	0.48	433	260	21	0.16
SJ SR1	2	725.11	OC		2.33	1.06	6.03	0.4	435	259	17	0.15
SJ SR1	3	725.11	OC		2.3	1.01	6.03	0.49	439	262	21	0.14
SJ SR1	4	725.11	OC		2.28	0.94	5.82	0.53	438	255	23	0.14

Iatroscan data

Well	Top-Depth (m)	Base-Depth (m)	Type	Lith	Smpl Wt (g)	WtExtr/Oil (mg)	ExtYield (ppm)	Sats (Wt%)	Arom (Wt%)	NSO (Wt%)	Asph (Wt%)
NO 7220/8-1	860	860	MUD		5.18	143	27606.18	0.82	0.00	99.18	2.90
NO 7220/8-1	1258	1258	DC		7.78	35	4498.71	7.96	0.83	91.20	3.50
NO 7220/8-1	1270	1270	MUD		5	138	27600.00	0.82	0.00	99.18	4.00
NO 7220/8-1	1300.53	1300.53	COCH		42.04	107	2545.20	32.12	9.17	58.71	17.20
NO 7220/8-1	1309.6	1309.6	COCH		21.77	100	4593.48	52.63	16.95	30.42	10.20
NO 7220/8-1	1314.7	1314.7	COCH		2.72	45	16544.12	70.33	24.32	5.36	2.70
NO 7220/8-1	1318.5	1318.5	COCH		1.65	70	42424.24	69.41	24.44	6.15	1.00
NO 7220/8-1	1320.6	1320.6	MDT					70.27	25.61	3.82	0.30
NO 7220/8-1	1336.8	1336.8	MDT					71.73	22.01	6.03	0.24
NO 7220/8-1	1339.9	1339.9	COCH		1.83	62	33879.78	72.71	21.28	6.01	2.20
NO 7220/8-1	1350.9	1350.9	COCH		2.56	77	30078.13	72.79	21.95	5.26	1.70
NO 7220/8-1	1360.35	1360.35	COCH		1.83	93	50819.67	71.16	23.52	5.32	1.60
NO 7220/8-1	1370.45	1370.45	COCH		3.1	84	27096.77	71.08	22.84	6.08	2.10
NO 7220/8-1	1380.5	1380.5	MDT					73.43	21.78	4.48	0.31
NO 7220/8-1	1385.7	1385.7	COCH		2.38	52	21848.74	71.23	24.20	4.57	3.20
NO 7220/8-1	1398.8	1398.8	COCH		2.34	49	20940.17	69.49	25.13	5.39	6.80
NO 7220/8-1	1400.65	1400.65	COCH		46	102	2217.39	9.52	2.49	87.99	67.80
NO 7220/8-1	1405	1405	MUD		5.13	133	25925.93	1.63	0.00	98.37	3.80
NO 7220/8-1	2210	2210	MUD		5.48	100	18248.18	1.63	0.00	98.37	2.70
NO NSO1	1	806.11	FLUI					60.15	30.08	9.77	
NO NSO1	1	516.11	FLUI					59.94	27.89	12.17	
NO NSO1	1	730.11	FLUI					62.74	25.31	11.94	
NO NSO1	1	516.11	REF					59.94	27.89	12.17	
NO NSO1	1	510.11	FLUI					62.03	28.32	9.65	
NO NSO1	1	510.11	REF					62.03	28.32	9.65	
NO NSO1	2	730.11	FLUI					61.24	30.66	8.11	

GC-whole oil (ng/g)

Well	Top depth (m)	Base Depth (m)	Type	Lithostrat	Period	iC5_am	nC5_am	22dm-C4_am	cyC5_am	23dm-C4_am	2m-C5_am	3m-C5_am
'NO 7220/8-1	1320.6	1320.6	MDT	Stø	Jurassic	1786214	2326759	103161.7	259841.9	280612.8	1304264	790075.5
'NO 7220/8-1	1336.8	1336.8	MDT	Stø	Jurassic	1239465	1741231	83331.58	215492.8	243026.2	1104871	672317.1
'NO 7220/8-1	1380.5	1380.5	MDT	Nordmela	Jurassic	1680362	2231451	102274.1	262571.9	272242.6	1259062	758381.4
'NO NSO1	1	806.11	REF			2867692	4905061	159659.9	739680.4	473093.6	3222059	1993592

Well	Base Depth (m)	Type	nC6_am	3m-cyC5-ene_am	22dm-C5_am	m-cyC5_am	24dm-C5_am	223tm-C4_am	33dm-C5_am	cyC6_am	2m-C6_am	23dm-C5_am
'NO 7220/8-1	1320.6	MDT	2295828	1498	69143.25	1467859	136097.6	41982.89	48057.46	1640492	739696.4	262842.5
'NO 7220/8-1	1336.8	MDT	1996364	743.78	61493.84	1331575	127112.4	39394.21	46417.96	1735366	696010.6	273391.1
'NO 7220/8-1	1380.5	MDT	2203326	731.05	68420.84	1457858	138930.6	43757.85	52074.86	1851443	735170.5	284674.6
'NO NSO1	806.11	REF	7044514	3050.98	167987.6	3607601	357329.2	32823.58	110430.4	6378773	2457458	798614.1

Well	Base Depth (m)	Type	11dm-cyC5_am	3m-C6_am	1c,3dm-cyC5_am	1t,3dm-cyC5_am	3e-C5_am	1t,2dm-cyC5_am	nC7_am	1c,2-dm-cyC5_am	m-cyC6_am	113tm-cyC5_am
'NO 7220/8-1	1320.6	MDT	313429.8	814412.4	417688.4	382005.5	87591.27	657213.3	2347326	77027.53	4361817	322773.3
'NO 7220/8-1	1336.8	MDT	299632.6	774206.1	398501.6	361039.7	86406.94	623609.9	2247106	92161.75	4242166	317534.6
'NO 7220/8-1	1380.5	MDT	324047.2	809882.4	424419.8	387484.3	88118.95	671663.8	2328364	96406.23	4456139	335085.2
'NO NSO1	806.11	REF	603935.8	2732642	910453.4	836606.4	234077.3	1638004	8205489	195186.4	1.12E+07	647871.1

Well	Base Depth (m)	Type	e-cyC5_am	25dm-C6_am	223tm-C5;24dm-C6_am	1c,2t,4tm-cyC5_am	33dm-C6_am	1t,2c,3tm-cyC5_am	234tm-C5_am	23dm-C6_am	2m-C7_am	4m-C7_am
'NO 7220/8-1	1320.6	MDT	249564	111661.9	163511.2	240905.2	50983.78	242089.9	40119.7	281939	898478.1	246663.1
'NO 7220/8-1	1336.8	MDT	242939.1	110026	159869.6	236346.9	49586.9	236124.2	39655.25	283721.1	882266.3	252987.4
'NO 7220/8-1	1380.5	MDT	255208.8	113113.9	164305.1	245795.9	51319.37	240716.1	43726.35	298284.2	908066.7	249822.5
'NO NSO1	806.11	REF	687154.3	376875	499888.8	578189.6	139254.5	607745.4	131451	624409.5	3095496	984969.1

Well	Base Depth (m)	Type	3m-C7_am	1c,3dm-cyC6_am	1t,4dm-cyC6_am	11dm-cyC6_am	1t,2dm-cyC6_am	nC8_am	e-cyC6_am	iC9_am	4m-C8_am	2m-C8_am
'NO 7220/8-1	1320.6	MDT	542393.3	1243771	418675.3	214451.2	642282.6	2605132	1070353	693137.9	281391.8	395745.7
'NO 7220/8-1	1336.8	MDT	528985.4	1235329	416129.6	213047.7	638294.2	2586009	1066013	693617.4	280263.8	395630
'NO 7220/8-1	1380.5	MDT	542796.7	1265437	424915.8	218657.3	658023.8	2633079	1085710	721173.3	281474.4	398117.3
'NO NSO1	806.11	REF	1952467	2728957	979162.1	691248.4	1325609	9137525	3751279	1276545	1199758	1519111

Well	Base Depth (m)	Type	3m-C8_am	nC9_am	iC10_am	nC10_am	iC11_am	nC11_am	nC12_am	iC13_am	iC14_am	nC13_am
'NO 7220/8-1	1320.6	MDT	489139.7	2373875	676532.5	2477196	844111.9	2784566	2513651	729310.6	887284.9	2826706
'NO 7220/8-1	1336.8	MDT	480228.1	2372523	679589.9	2436649	851089.2	2684441	2548558	802265.6	921627.9	2901143
'NO 7220/8-1	1380.5	MDT	494129.5	2394228	688462.3	2509473	864397.2	2841634	2693022	749454.5	942381.9	2895670
'NO NSO1	806.11	REF	1653132	8528014	1715592	7958254	1778482	7805732	7330452	1612739	1765848	7974450

Well	Base Depth (m)	Type	iC15_am	nC14_am	iC16_am	nC15_am	nC16_am	iC18_am	nC17_am	Pristane_am	nC18_am	Phytane_am
'NO 7220/8-1	1320.6	MDT	1997276	2434741	4030954	2687173	2856142	3861734	2789757	9239086	2439768	4071035
'NO 7220/8-1	1336.8	MDT	2075758	2491515	4171024	2712422	2878493	3880813	2807217	9288065	2434994	4064241
'NO 7220/8-1	1380.5	MDT	2025890	2548409	4125180	2889769	2941414	3941154	2908775	9501068	2532244	4253133
'NO NSO1	806.11	REF	1492656	6477329	2173824	5999350	5307056	1723195	5049152	2963240	3979119	1745589

Well	Base Depth (m)	Type	nC19_am	nC20_am	Benzene_am	Toluene/233tm-C5_am	e-benzene_am	m-xylene_am	p-xylene_am	o-xylene_am
'NO 7220/8-1	1320.6	MDT	3719770	2401237	604747.8	1771670	365328.4	1318731	432419.7	913525.6
'NO 7220/8-1	1336.8	MDT	3701864	2422343	566039.8	1746459	365261.4	1319892	432454.6	863885.5
'NO 7220/8-1	1380.5	MDT	3824717	2495068	609482.5	1801445	370562	1343419	442741.7	933424.8
'NO NSO1	806.11	REF	4220370	3338747	2947155	7265254	1393381	4524561	1228751	2576850

Address:	**Applied Petroleum Technology AS** **P.O.Box 123** **2027 Kjeller**
Telephone:	**+47 63 80 60 00**
Telefax:	**+47 63 80 11 38**

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Authors
Rick Harding
Ingar Johansen
Geir Hansen

	Name	Date	Signature
Reviewed by	Geir Hansen	2011-09-23	
Approved by	Tore Haaland	2011-09-23	

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Table 1. Number of analyses performed

Analysis	Cuttings	Core	Fluid	Gas	Total
Lithology	24	2			26
Vitrinite reflectance	24	2			26
Headspace	4				4
Gas composition				12	12
Stable isotopes of gas				6	6
Stable isotopes of fractions		7	3		10

Table 2. Lithology Description

Well	Sample type	Upper Depth (m)	Lower Depth (m)	APT ID	%	Lithology	Attributes
7220/8-1	DC	860	860	86166	100 %	CLYST	lt gy- gy, sl calc
7220/8-1	DC	950	950	86167A	100%	CLYST	gy-md drk gy
7220/8-1	DC	950	950	86167B	trace	SLST	lt gy
7220/8-1	DC	950	950	86167C	trace	CONTAM	bar
7220/8-1	DC	1050	1050	86168	100 %	CLYST	gy-md drk gy
7220/8-1	DC	1150	1150	86169	100 %	CLYST	md drk gy
7220/8-1	DC	1221	1221	86170	100 %	CLYST	md dr,k gy, sl slty
7220/8-1	DC	1248	1248	86171A	90%	SST	op-mlky w, vf-f, l
7220/8-1	DC	1248	1248	86171B	10%	CLYST	md drk gy
7220/8-1	DC	1258	1258	86172A	40%	SST	op- mlky w, vf-f, l
7220/8-1	DC	1258	1258	86172B	30%	CLYST	md drk gy-drk gy
7220/8-1	DC	1258	1258	86172C	30%	LST	lt y gy
7220/8-1	DC	1270	1270	86173A	80%	CLYST	md drk gy
7220/8-1	DC	1270	1270	86173B	10%	LST	lt y gy- lt gy
7220/8-1	DC	1270	1270	86173C	10%	CONTAM	ddm
7220/8-1	DC	1270	1270	86173D	trace	SST	op- mlky w, ll
7220/8-1	COPL	1355.01	1355.01	86174A	90%	SST	op- mlky w- lt smky gy, f-crs, congl
7220/8-1	COPL	1355.01	1355.01	86174B	10%	COAL	ol blck- blck
7220/8-1	COPL	1379.02	1379.02	86175	100 %	CLYST	md drk ol gy, sl slty
7220/8-1	DC	1414	1414	86176A	70%	SST	op- mlky w, f-md. l
7220/8-1	DC	1414	1414	86176B	30%	CLYST	md drk gy, sl slty
7220/8-1	DC	1414	1414	86176C	trace	LST	lt gy w
7220/8-1	DC	1459	1459	86177A	85%	SST	op- lt gy, vf-f, l
7220/8-1	DC	1459	1459	86177B	15%	CLYST	md drk gy- drk gy
7220/8-1	DC	1459	1459	86177C	trace	CONTAM	paint, plast
7220/8-1	DC	1501	1501	86178A	75%	SST	op- mlky w, f-md, l
7220/8-1	DC	1501	1501	86178B	20%	CLYST	md drk gy-drk gy
7220/8-1	DC	1501	1501	86178C	5%	SLST	lt gy-gy
7220/8-1	DC	1660	1660	86179A	80%	SST	op-mlky w, f-md, l
7220/8-1	DC	1660	1660	86179B	10%	CLYST	md drk gy- drk gy, slty
7220/8-1	DC	1660	1660	86179C	10%	SLST	lt gy- gy
7220/8-1	DC	1678	1678	86180A	70%	SST	op- mlky w, f-md, l
7220/8-1	DC	1678	1678	86180B	30%	CLYST	gy- md drk gy
7220/8-1	DC	1741	1741	86181A	75%	SST	op- mlky w- lt gy, vf-f-md, l
7220/8-1	DC	1741	1741	86181B	20%	CLYST	gy- md drk gy
7220/8-1	DC	1741	1741	86181C	5%	SLST	gy w- lt gy
7220/8-1	DC	1792	1792	86182A	65%	SST	op- mlky w, vf-f
7220/8-1	DC	1792	1792	86182B	30%	SLST	gy w- lt gy
7220/8-1	DC	1792	1792	86182C	5%	CLYST	md drk gy- drk gy
7220/8-1	DC	1813	1813	86183A	85%	SST	op- mlky w, f, l
7220/8-1	DC	1813	1813	86183B	10%	SLST	gy w- lt gy
7220/8-1	DC	1813	1813	86183C	5%	CLYST	drk brn gy- drk gy
7220/8-1	DC	1891	1891	86184A	100%	SLST	mlky w- lt gy w- lt gy
7220/8-1	DC	1891	1891	86184B	trace	CLYST	drk brn gy- drk gy
7220/8-1	DC	1891	1891	86184C	trace	COAL	blck

Well	Sample type	Upper Depth (m)	Lower Depth (m)	APT ID	%	Lithology	Attributes
7220/8-1	DC	1951	1951	86185A	100%	SLST	mlky w- lt gy w- lt gy
7220/8-1	DC	1951	1951	86185B	trace	CLYST	md drk gy
7220/8-1	DC	2008	2008	86186A	90%	SLST	mlky w-lt gyw- lt gy
7220/8-1	DC	2008	2008	86186B	10%	CLYST	md drk gy- drk gy
7220/8-1	DC	2008	2008	86186C	trace	CONTAM	ddm
7220/8-1	DC	2056	2056	86187A	80%	SLST	mlky w- lt gy
7220/8-1	DC	2056	2056	86187B	20%	CLYST	gy- md drk gy- drk gy
7220/8-1	DC	2107	2107	86188A	80%	CLYST	md drk gy
7220/8-1	DC	2107	2107	86188B	15%	SLST	mlky w- lt gy
7220/8-1	DC	2107	2107	86188C	5%	CONTAM	ddm
7220/8-1	DC	2137	2137	86189A	95%	CLYST	md drk gy
7220/8-1	DC	2137	2137	86189B	5%	SLST	mlky w- lt gy w
7220/8-1	DC	2137	2137	86189C	trace	CONTAM	ddm
7220/8-1	DC	2200	2200	86190A	50%	SST	op- mlky w, f, l
7220/8-1	DC	2200	2200	86190B	30%	CLYST	gy- md drk gy
7220/8-1	DC	2200	2200	86190C	20%	SLST	mlky w- lt gy
7220/8-1	DC	2221	2221	86191A	75%	SLST	mlky w-lt gy w- lt gy
7220/8-1	DC	2221	2221	86191B	25%	CLYST	gy- md drk gy- drk gy

Table 3. Vitrinite Reflectance

Well	Sample type	Upper Depth (m)	Lower Depth (m)	APT ID	Sample prep.	%Lithology	%Ro	Std. dev	No. of measurements	Quality rating	Overall quality	Comment
7220/8-1	DC	860	860	86166	Bulk	Clyst	0.33	0.06	15	-ooooo	G	See data sheet
7220/8-1	DC	950	950	86167	Bulk	Clyst	barren					See data sheet
7220/8-1	DC	1050	1050	86168	Bulk	Clyst	0.39	0.07	12	ooo-oo	M	See data sheet
7220/8-1	DC	1150	1150	86169	Bulk	Clyst	0.32	0.00	1	ooo-oo	P	See data sheet
7220/8-1	DC	1221	1221	86170	Bulk	Clyst	barren					See data sheet
7220/8-1	DC	1248	1248	86171	Bulk	Sst	barren					See data sheet
7220/8-1	DC	1258	1258	86172	Bulk	Sst	0.45	0.05	14	oooooo	M	See data sheet
7220/8-1	DC	1270	1270	86173	Bulk	Clyst	0.42	0.05	11	ooo--o	P	See data sheet
7220/8-1	COPL	1355.01	1355.01	86174	Bulk	Sst	0.41	0.04	22	oo-o-o	M	See data sheet
7220/8-1	COPL	1379.02	1379.02	86175	Bulk	Clyst	0.39	0.04	9	o--ooo	P	See data sheet
7220/8-1	DC	1414	1414	86176	Bulk	Sst	0.44	0.05	19	oooooo	M	See data sheet
7220/8-1	DC	1459	1459	86177	Bulk	Sst	0.40	0.05	24	oooo-o	M	See data sheet
7220/8-1	DC	1501	1501	86178	Bulk	Sst	0.44	0.05	23	oooooo	G	See data sheet
7220/8-1	DC	1660	1660	86179	Bulk	Sst	0.45	0.06	40	oooooo	G	See data sheet
7220/8-1	DC	1678	1678	86180	Bulk	Sst	0.43	0.04	29	oooooo	G	See data sheet
7220/8-1	DC	1741	1741	86181	Bulk	Sst	0.45	0.05	34	oooo-o	M	See data sheet
7220/8-1	DC	1792	1792	86182	Bulk	Sst	0.44	0.05	40	oooo-o	M	See data sheet
7220/8-1	DC	1813	1813	86183	Bulk	Sst	0.53	0.05	40	oooooo	G	See data sheet
7220/8-1	DC	1891	1891	86184	Bulk	Sltst	barren					See data sheet
7220/8-1	DC	1951	1951	86185	Bulk	Sltst	0.52	0.08	19	oooo-o	M	See data sheet
7220/8-1	DC	2008	2008	86186	Bulk	Sltst	0.51	0.07	25	oooooo	G	See data sheet
7220/8-1	DC	2056	2056	86187	Bulk	Sltst	0.53	0.06	37	oo+o-o	M	See data sheet
7220/8-1	DC	2107	2107	86188	Bulk	Clyst	0.55	0.06	7	oooooo	P	See data sheet
7220/8-1	DC	2137	2137	86189	Bulk	Clyst	0.55	0.06	20	oo+--o	P	See data sheet
7220/8-1	DC	2200	2200	86190	Bulk	Sst	0.50	0.06	35	oooo-o	M	See data sheet
7220/8-1	DC	2221	2221	86191	Bulk	Sltst	0.54	0.07	37	oooo-o	M	See data sheet

Legend to Vitrinite reflectance data

Lithology code		**Sample quality**		**Sample preparation**	
sst	Sandstone	G	Good	HF	Sample treatment with hydrofluoric acid prior to analysis
slst	Siltstone	M	Moderate		
clyst	Claystone	P	Poor	Bulk	Sample treated as bulk rock
sh	Shale	st	Hydrocarbon staining		
lst	Limestone				
coal	Coal				

Sample description and measurement evaluation (perfect sample characterised as: oooooo)

Sign order	**Parameter**	**Sign**	**Sign legend:**
1	Abundance of vitrinite	-o	- May give too low vitrinite reflectance sample value
2	Identification of vitrinite	-o+	o Reliable vitrinite reflectance sample value
3	Type of vitrinite	-o+	+ May give too high vitrinite reflectance sample value
4	Vitrinite fragment size	-o	
5	Vitrinite surface quality	-o	
6	Abundance of pyrite	o+	

Table 4. Gas Composition (volume-%)

Well	Sample type	Upper Depth (m)	Lower Depth (m)	APT ID	C1 (%THCG)	C2 (%THCG)	C3 (%THCG)	iC4 (%THCG)	nC4 (%THCG)	neoC5 (%THCG)	iC5 (%THCG)	nC5 (%THCG)	C6+ (%THCG)	C02 (%THCG)	ppm THCG	H2 (%Total)	N2 (%Total)	O2+Ar (%Total)	ppm Total	C1-nC4 (%THCG)
7220/8-1	Gas Test	1320.60	1320.60	86150	91.7	5.29	1.99	0.23	0.35	0.0065	0.079	0.079	0.11	0.14	1031941	0.0000	0.67	0.0000	1038897	99.6
7220/8-1	Gas Test	1336.80	1336.80	86151	84.2	7.22	4.79	0.85	1.53	0.031	0.43	0.42	0.43	0.12	1009654	0.0044	1.79	0.23	1030515	98.6
7220/8-1	Gas Test	1380.50	1380.50	86152	93.4	4.39	1.44	0.17	0.24	0.0048	0.052	0.050	0.11	0.15	925996	0.0011	8.65	1.99	1036238	99.6
7220/8-1	Isotube	1280	1280	86153										100.1	1248		77.8	22.1	993712	0.0000
7220/8-1	Isotube	1311	1311	86154	88.7	2.31	0.82	0.12	0.17		0.039	0.045		7.80	15403	0.0060	76.8	21.6	995283	92.1
7220/8-1	Isotube	1387	1387	86155	82.3	5.78	3.65	0.66	1.28		0.39	0.43	0.55	4.97	15829	0.015	76.9	21.5	994870	93.7
7220/8-1	Isotube	1480	1480	86156	27.5	1.03	0.42		0.19		0.14	0.31	0.81	69.6	3582	0.0032	77.9	21.7	994762	29.1
7220/8-1	Isotube	1630	1630	86157	16.9	0.65	0.23					0.085	0.68	81.5	3528	0.0036	78.0	21.7	996117	17.8
7220/8-1	Isotube	1720	1720	86158	34.4	1.06	0.24						0.92	63.4	2919	0.0042	78.1	21.6	995628	35.7
7220/8-1	Isotube	1870	1870	86159	39.7	1.06	0.23						0.63	58.3	3006	0.0045	78.4	21.3	994900	41.0
7220/8-1	Isotube	1990	1990	86160	45.0	0.98	0.17						0.25	53.6	5161	0.0062	78.4	21.1	994869	46.1
7220/8-1	Isotube	2110	2110	86161	42.9	1.15	0.33						0.31	55.3	4159	0.0049	78.6	21.0	994852	44.4
7220/8-1	DCG	1180	1180	86162	0.46	0.048	0.035	0.013	0.018		0.011	0.014	0.023	99.4	416525	1.08	53.1	3.53	984492	0.57
7220/8-1	DCG	1240	1240	86163	1.11	0.48	0.88	0.20	0.29	0.027	0.088	0.082	0.15	96.7	432204	1.07	54.8	0.22	983859	2.96
7220/8-1	DCG	1252	1252	86164	0.20	0.061	0.13	0.032	0.052	0.0044	0.018	0.019	0.068	99.4	517652	1.32	45.7	0.31	982195	0.47
7220/8-1	DCG	1279	1279	86165	0.34	0.060	0.10	0.022	0.053		0.019	0.024	0.071	99.3	381038	3.79	53.9	3.12	971722	0.57

Table 4. continued, Gas Composition (volume-%)

Well	Sample type	Upper Depth (m)	Lower Depth (m)	APT ID	C2-nC4 (%THCG)	C5+ (%THCG)	Wetness	iC4/nC4
7220/8-1	Gas Test	1320.60	1320.60	86150	7.87	0.27	7.90	0.67
7220/8-1	Gas Test	1336.80	1336.80	86151	14.4	1.30	14.6	0.55
7220/8-1	Gas Test	1380.50	1380.50	86152	6.24	0.21	6.26	0.68
7220/8-1	Isotube	1280	1280	86153	0.0000	0.0000		
7220/8-1	Isotube	1311	1311	86154	3.42	0.084	3.72	0.67
7220/8-1	Isotube	1387	1387	86155	11.4	1.36	12.1	0.51
7220/8-1	Isotube	1480	1480	86156	1.64	1.25	5.62	
7220/8-1	Isotube	1630	1630	86157	0.88	0.76	4.93	
7220/8-1	Isotube	1720	1720	86158	1.30	0.92	3.63	
7220/8-1	Isotube	1870	1870	86159	1.29	0.63	3.15	
7220/8-1	Isotube	1990	1990	86160	1.16	0.25	2.51	
7220/8-1	Isotube	2110	2110	86161	1.48	0.31	3.34	
7220/8-1	DCG	1180	1180	86162	0.11	0.048	20.0	0.69
7220/8-1	DCG	1240	1240	86163	1.85	0.35	62.5	0.69
7220/8-1	DCG	1252	1252	86164	0.27	0.11	57.5	0.62
7220/8-1	DCG	1279	1279	86165	0.24	0.11	41.5	0.41

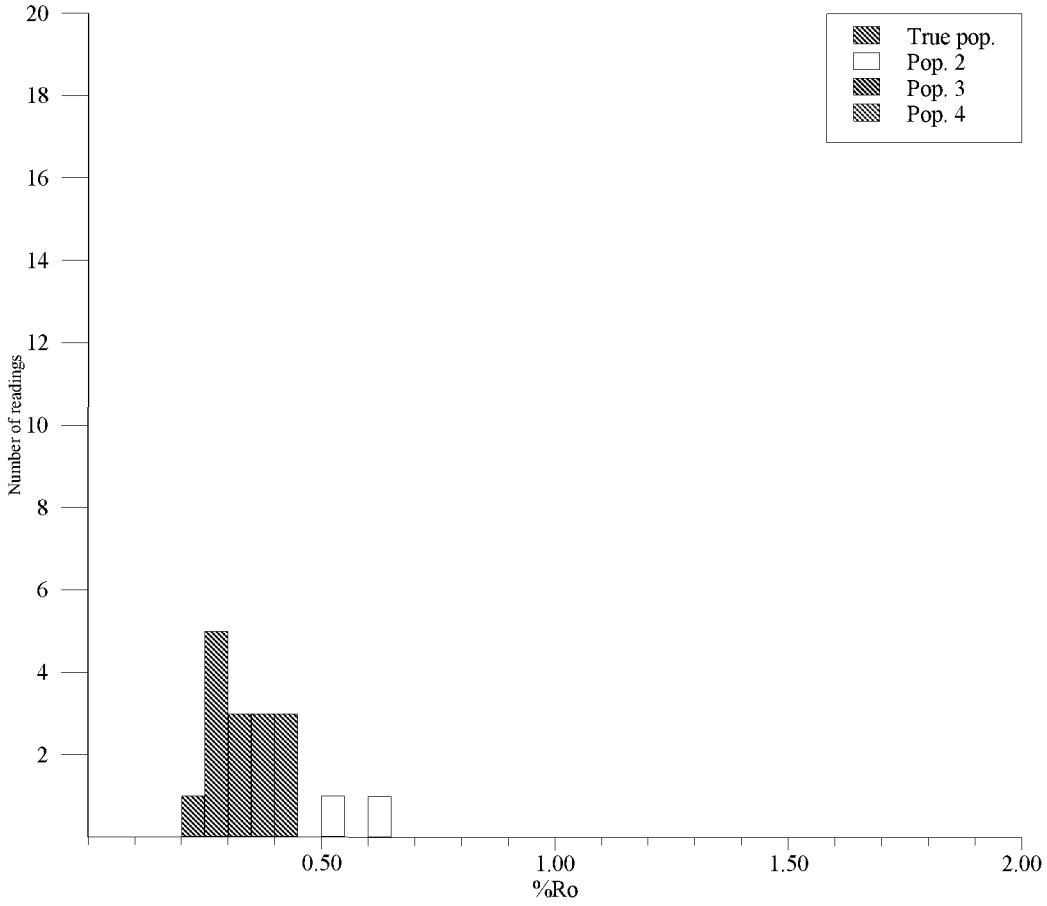
Table 5. Gas Isotopes (δ13C (‰ PDB) & δD (‰ SMOW))

Well	Sample type	Upper Depth (m)	Lower Depth (m)	APT ID	C1 δ13C	C2 δ13C	C3 δ13C	i-C4 δ13C	n-C4 δ13C	i-C5 δ13C	n-C5 d13C	CO2 d13C	C1 δD	
7220/8-1	Gas Test	1320.60	1320.60	86150	-43.5	-30.7	-29.9	-29.6	-30.2	-29.2	-29.7		-188.0	
7220/8-1	Gas Test	1336.80	1336.80	86151	-43.5	-30.6	-30.0	-29.7	-30.4	-29.1	-29.9		-191.0	
7220/8-1	Gas Test	1380.50	1380.50	86152	-43.8	-30.5	-29.7	-28.9	-30.2	-29.0	-29.8		-193.0	
7220/8-1	Isotube	1311	1311	86154	-42.3	-29.8	-29.6					-13.0	-198.4	
7220/8-1	Isotube	1387	1387	86155	-43.9	-30.1	-30.2	-30.0	-29.6	-29.8	-29.7	-13.4	-202.5	
7220/8-1	Isotube	1480	1480	86156	-45.7	-33.3	-31.2					-22.3	-223.0	

Table 6. Isotopes of fractions, δ13C (‰ PDB)

Well	Sample type	Upper Depth (m)	Lower Depth (m)	APT ID	δ13C Oil/EOM	δ13C-Sat	δ13C-Aro
7220/8-1	Oil	1320.60	1320.60	88315		-30.1	-28.9
7220/8-1	Oil	1336.80	1336.80	88316		-30.0	-28.8
7220/8-1	Oil	1380.50	1380.50	88317		-30.0	-28.9

Vitrinite Reflectance Sample Data Sheets



Sample info:

Well	7220/8-1
Lower depth	860
Sample type	DC
Lithology	Clyst
Preparation	Bulk
Date of analysis	25.07.2011
APT ID	86166

Quality rating:

Average sample quality	G
Abundance of vitrinite	-
Identification of vitrinite	o
Type of vitrinite	o
Particle size	o
Particle surface quality	o
Abundance of pyrite	o

Legend to quality rating:

No effect on the readings	o
Possibly too low readings	-
Possibly too high readings	+
Good quality	G
Moderate quality	M
Poor quality	P
Not vitrinite	X
Hydrocarbon staining	St

%Ro readings	True pop.	Pop. 2	Pop. 3	Pop. 4
%Mean±sd.	0.33±0.06	0.57±0.10		
Individual	0.240	0.500		
measurements	0.250	0.640		
3	0.260			
4	0.280			
5	0.280			
6	0.300			
7	0.310			
8	0.310			
9	0.320			
10	0.360			
11	0.360			
12	0.370			
13	0.400			
14	0.420			
15	0.440			
16				
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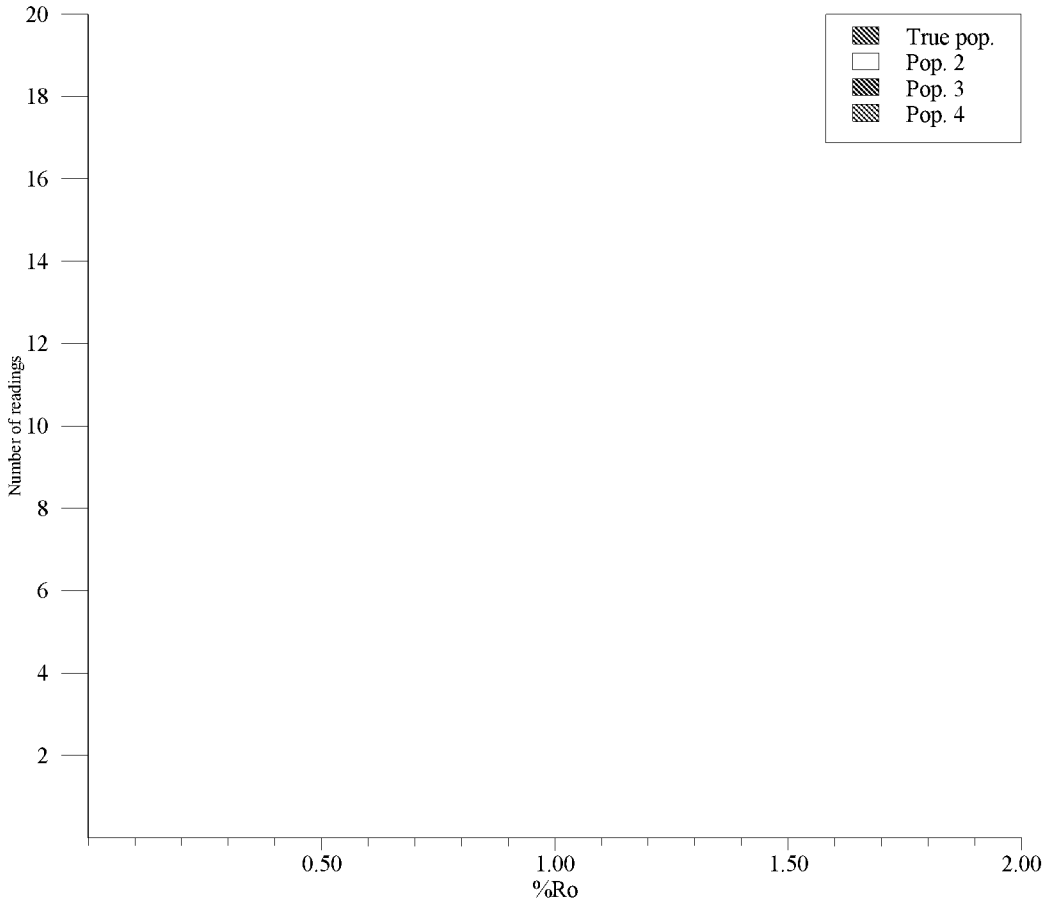
Comments:
Vitrinite abundance low but histogram profile fairly symmetridcal and the data seem reasonable.



Sample info:

Well	7220/8-1
Lower depth	950
Sample type	DC
Lithology	Clyst
Preparation	Bulk
Date of analysis	25.07.2011
APT ID	86167

Quality rating:

Average sample quality	P
Abundance of vitrinite	o
Identification of vitrinite	o
Type of vitrinite	o
Particle size	o
Particle surface quality	o
Abundance of pyrite	o

Legend to quality rating:

No effect on the readings	o
Possibly too low readings	-
Possibly too high readings	+
Good quality	G
Moderate quality	M
Poor quality	P
Not vitrinite	X
Hydrocarbon staining	St

%Ro readings %Mean±sd.	True pop.	Pop. 2	Pop. 3	Pop. 4
Individual measurements				
3				
4				
5				
6				
7				
8				
9				
10				
11				
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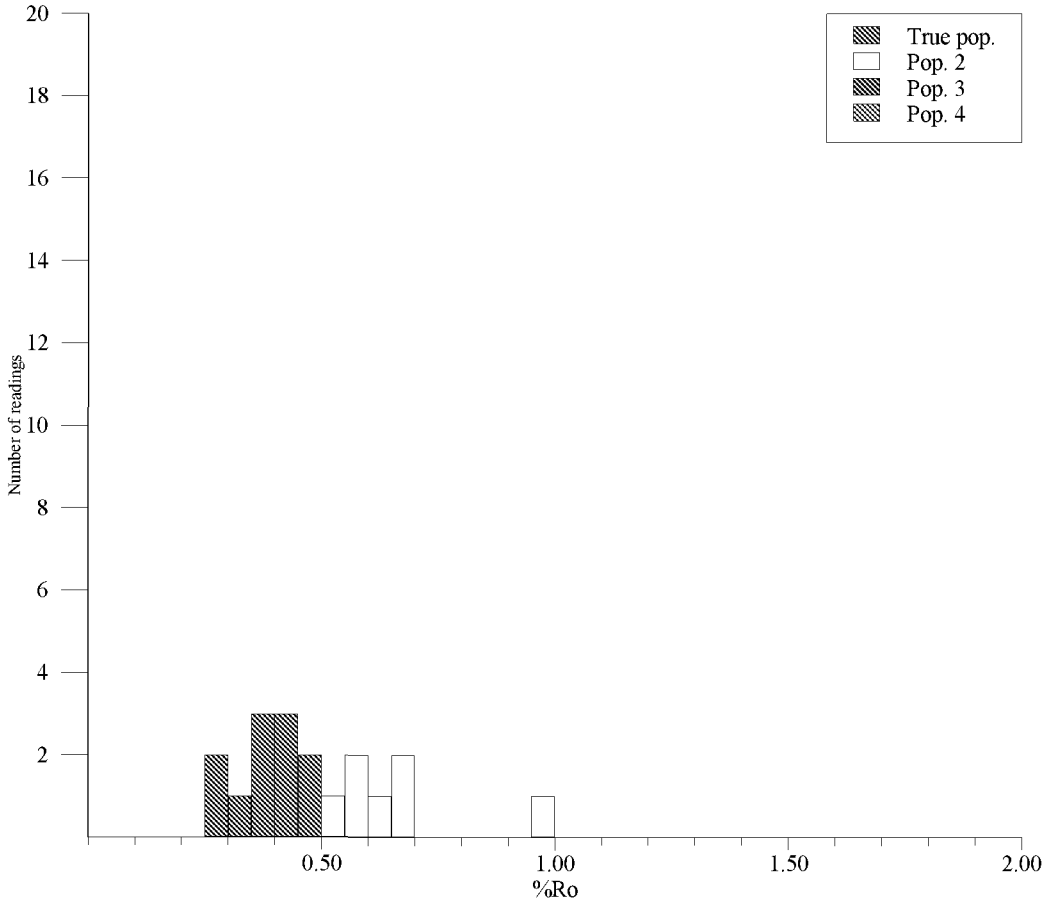
Comments:
Graphite of probable reworked organic origin dominates the kerogen; no indigenous phyoclasts are present.



Sample info:

Well	7220/8-1
Lower depth	1050
Sample type	DC
Lithology	Clyst
Preparation	Bulk
Date of analysis	15.07.2011
APT ID	86168

Quality rating:

Average sample quality	M
Abundance of vitrinite	o
Identification of vitrinite	o
Type of vitrinite	o
Particle size	-
Particle surface quality	o
Abundance of pyrite	o

Legend to quality rating:

No effect on the readings	o
Possibly too low readings	-
Possibly too high readings	+
Good quality	G
Moderate quality	M
Poor quality	P
Not vitrinite	X
Hydrocarbon staining	St

%Ro readings	True pop.	Pop. 2	Pop. 3	Pop. 4
%Mean±sd.	0.39±0.07	0.68±0.16		
Individual	0.260	0.550		
measurements	0.280	0.550		
3	0.340	0.640		
4	0.360	0.680		
5	0.370	0.690		
6	0.380	0.990		
7	0.410			
8	0.420			
9	0.430			
10	0.450			
11	0.490			
12	0.500			
13				
14				
15				
16				
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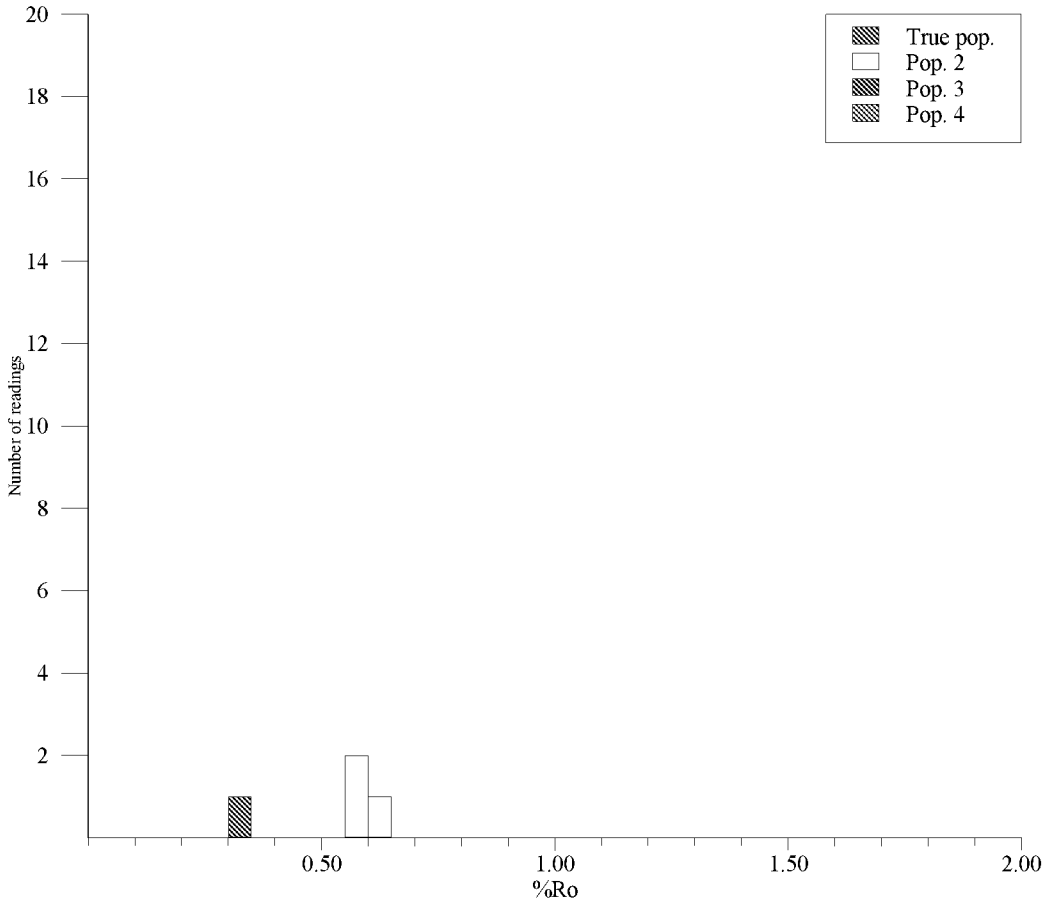
Comments:
Mainly reworked/inert humic particles; very little indigenous vitrinite.



Sample info:

Well	7220/8-1
Lower depth	1150
Sample type	DC
Lithology	Clyst
Preparation	Bulk
Date of analysis	25.07.2011
APT ID	86169

Quality rating:

Average sample quality	P
Abundance of vitrinite	o
Identification of vitrinite	o
Type of vitrinite	o
Particle size	-
Particle surface quality	o
Abundance of pyrite	o

Legend to quality rating:

No effect on the readings	o
Possibly too low readings	-
Possibly too high readings	+
Good quality	G
Moderate quality	M
Poor quality	P
Not vitrinite	X
Hydrocarbon staining	St

%Ro readings	True pop.	Pop. 2	Pop. 3	Pop. 4
%Mean±sd.	0.32±0.00	0.58±0.04		
Individual measurements	0.320	0.550		
		0.560		
3		0.620		
4				
5				
6				
7				
8				
9				
10				
11				
12				
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15				
16				
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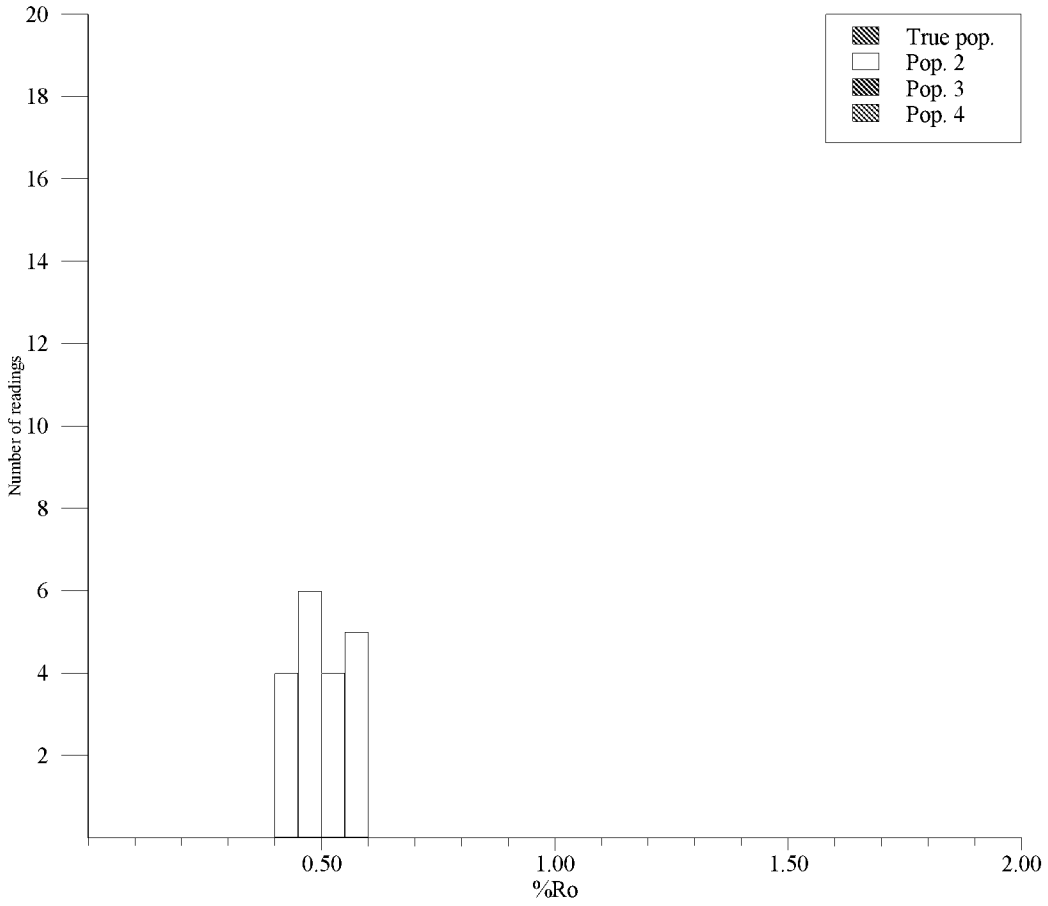
Comments:
Predominantly reworked/inert organic matter. Virtually no measurable vitrinite.



Sample info:

Well	7220/8-1
Lower depth	1221
Sample type	DC
Lithology	Clyst
Preparation	Bulk
Date of analysis	25.07.2011
APT ID	86170

Quality rating:

Average sample quality	M
Abundance of vitrinite	o
Identification of vitrinite	o
Type of vitrinite	o
Particle size	o
Particle surface quality	o
Abundance of pyrite	o

Legend to quality rating:

No effect on the readings	o
Possibly too low readings	-
Possibly too high readings	+
Good quality	G
Moderate quality	M
Poor quality	P
Not vitrinite	X
Hydrocarbon staining	St

%Ro readings	True pop.	Pop. 2	Pop. 3	Pop. 4
%Mean±sd.		0.50±0.06		
Individual		0.400		
measurements		0.400		
3		0.420		
4		0.440		
5		0.450		
6		0.450		
7		0.450		
8		0.470		
9		0.480		
10		0.490		
11		0.510		
12		0.530		
13		0.530		
14		0.540		
15		0.550		
16		0.560		
17		0.570		
18		0.580		
19		0.600		
20				
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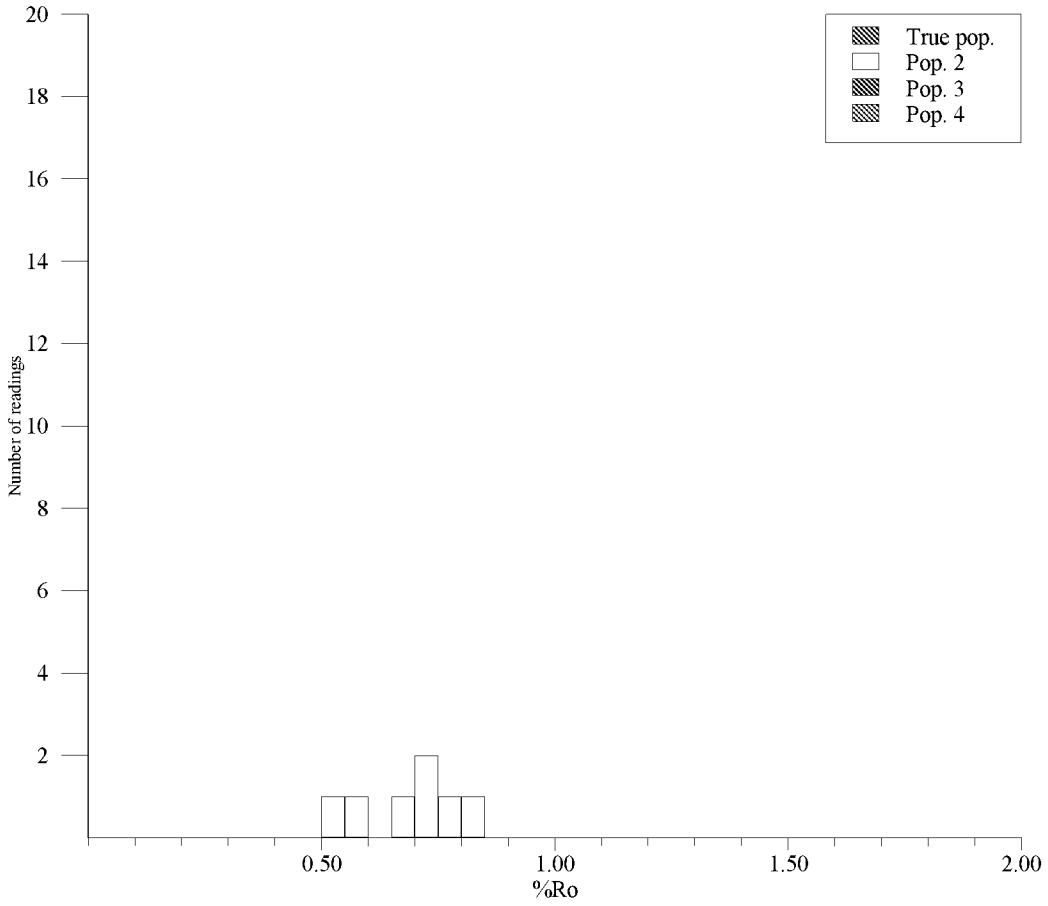
Comments:
Increased organic content, including vitrinite, but reworked vitrinite/inertinite is still overwhelmingly predominate.



Sample info:

Well	7220/8-1
Lower depth	1248
Sample type	DC
Lithology	Sst
Preparation	Bulk
Date of analysis	25.07.2011
APT ID	86171

Quality rating:

Average sample quality	P
Abundance of vitrinite	o
Identification of vitrinite	o
Type of vitrinite	o
Particle size	o
Particle surface quality	o
Abundance of pyrite	o

Legend to quality rating:

No effect on the readings	o
Possibly too low readings	-
Possibly too high readings	+
Good quality	G
Moderate quality	M
Poor quality	P
Not vitrinite	X
Hydrocarbon staining	St

%Ro readings	True pop.	Pop. 2	Pop. 3	Pop. 4
%Mean±sd.		0.69±0.11		
Individual		0.530		
measurements		0.580		
3		0.650		
4		0.730		
5		0.740		
6		0.780		
7		0.840		
8				
9				
10				
11				
12				
13				
14				
15				
16				
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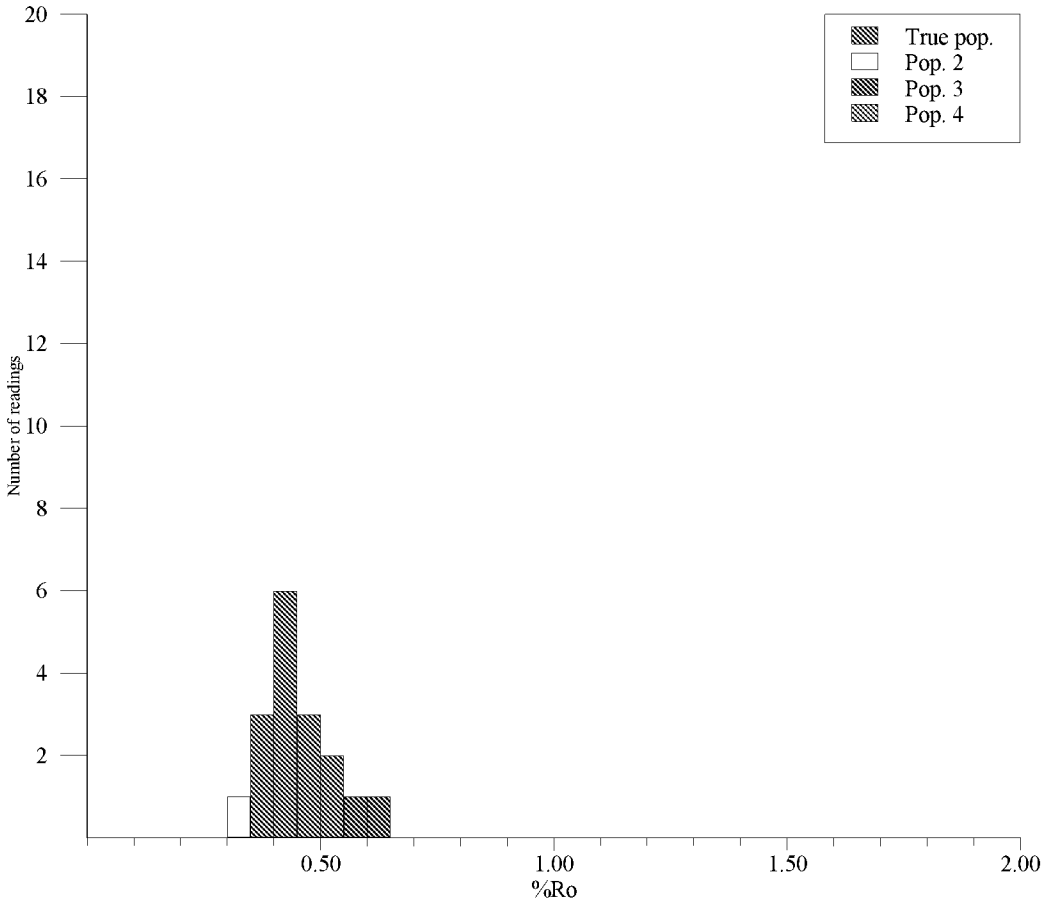
Comments:
No representative vitrinite; all organic matter is highly reflective and probably oxidised.



Sample info:

Well	7220/8-1
Lower depth	1258
Sample type	DC
Lithology	Sst
Preparation	Bulk
Date of analysis	25.07.2011
APT ID	86172

Quality rating:

Average sample quality	M
Abundance of vitrinite	o
Identification of vitrinite	o
Type of vitrinite	o
Particle size	o
Particle surface quality	o
Abundance of pyrite	o

Legend to quality rating:

No effect on the readings	o
Possibly too low readings	-
Possibly too high readings	+
Good quality	G
Moderate quality	M
Poor quality	P
Not vitrinite	X
Hydrocarbon staining	St

%Ro readings	True pop.	Pop. 2	Pop. 3	Pop. 4
%Mean±sd.	0.45±0.05	0.31±0.00	0.61±0.05	
Individual	0.380	0.310	0.570	
measurements	0.380		0.640	
3	0.390			
4	0.430			
5	0.430			
6	0.440			
7	0.440			
8	0.440			
9	0.440			
10	0.450			
11	0.470			
12	0.490			
13	0.540			
14	0.540			
15				
16				
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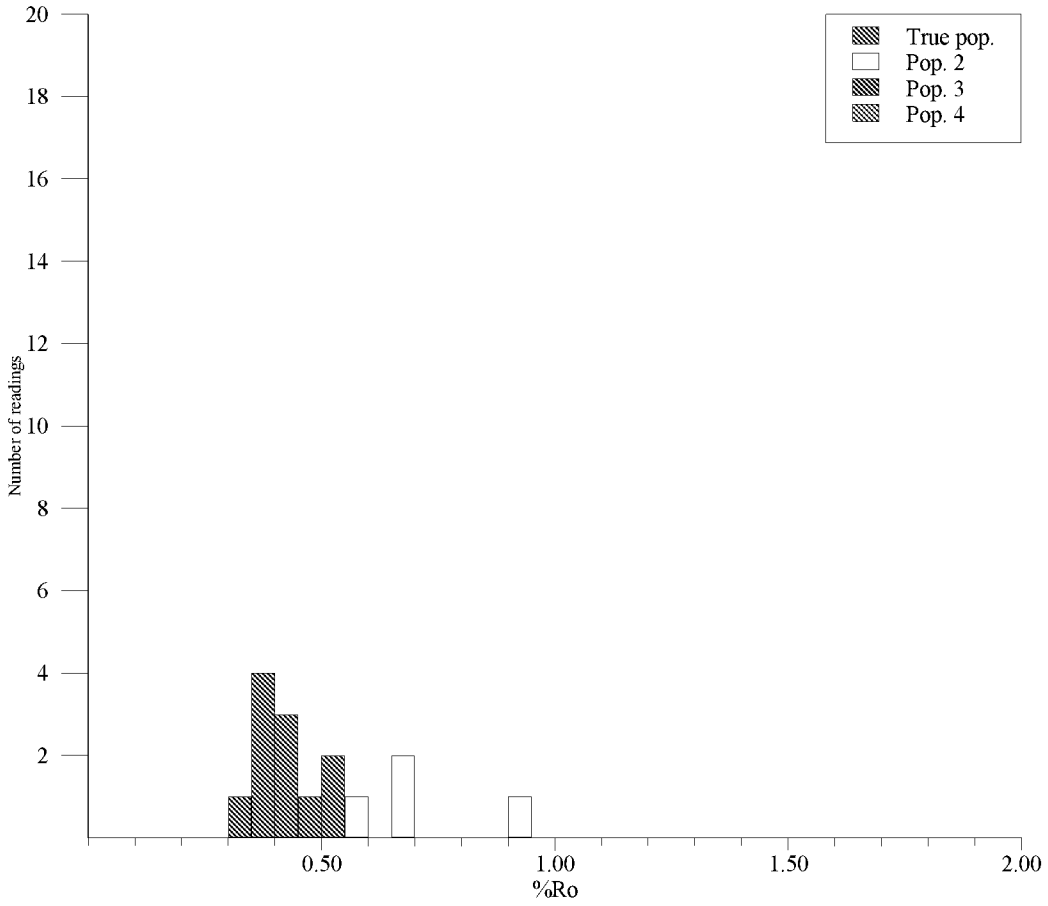
Comments:
Vitrinite rare, but well-preserved and reflectance well separated from other macerals. Data considered fair to good.



Sample info:

Well	7220/8-1
Lower depth	1270
Sample type	DC
Lithology	Clyst
Preparation	Bulk
Date of analysis	25.07.2011
APT ID	86173

Quality rating:

Average sample quality	P
Abundance of vitrinite	o
Identification of vitrinite	o
Type of vitrinite	o
Particle size	-
Particle surface quality	-
Abundance of pyrite	o

Legend to quality rating:

No effect on the readings	o
Possibly too low readings	-
Possibly too high readings	+
Good quality	G
Moderate quality	M
Poor quality	P
Not vitrinite	X
Hydrocarbon staining	St

%Ro readings	True pop.	Pop. 2	Pop. 3	Pop. 4
%Mean±sd.	0.42±0.05	0.71±0.15		
Individual	0.350	0.560		
measurements	0.370	0.660		
3	0.370	0.690		
4	0.370	0.920		
5	0.390			
6	0.430			
7	0.440			
8	0.440			
9	0.450			
10	0.500			
11	0.510			
12				
13				
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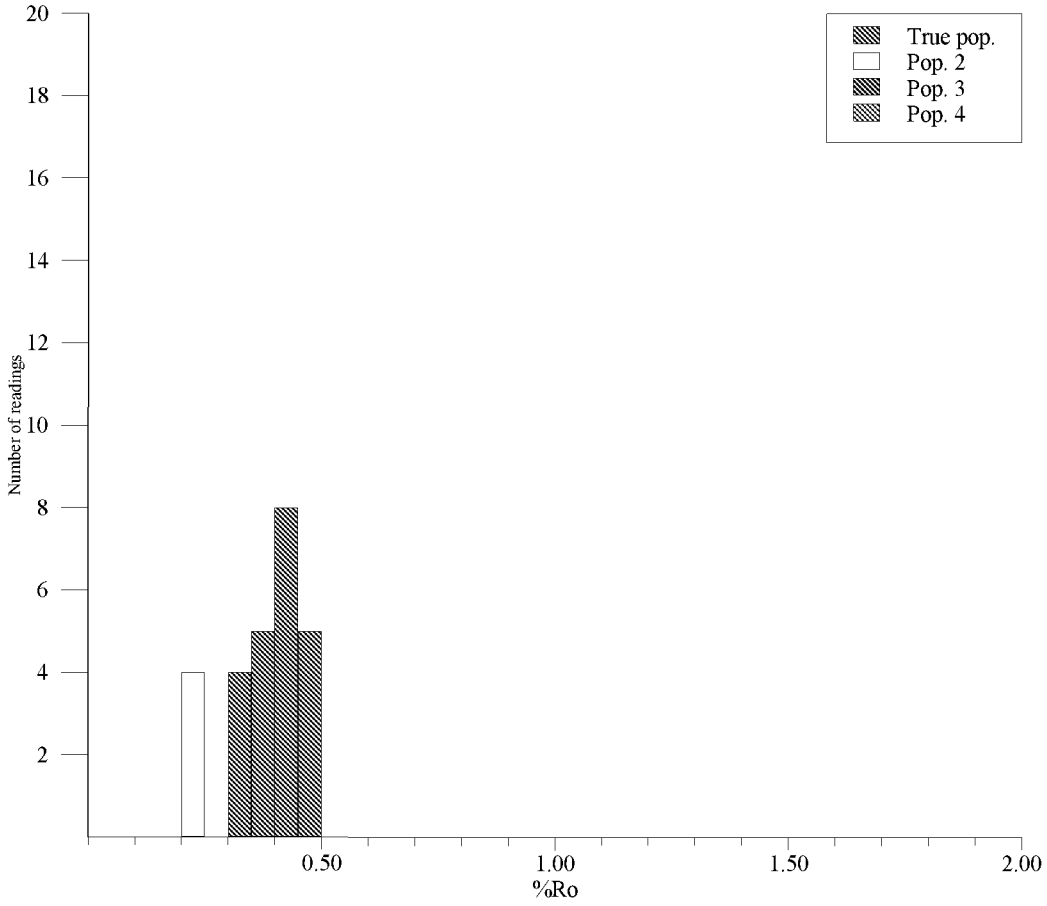
Comments:
Little vitrintie with poor surfaces. Reflectance probably underestimates maturity.



Sample info:

Well	7220/8-1
Lower depth	1355.01
Sample type	COPL
Lithology	Sst
Preparation	Bulk
Date of analysis	26.07.2011
APT ID	86174

Quality rating:

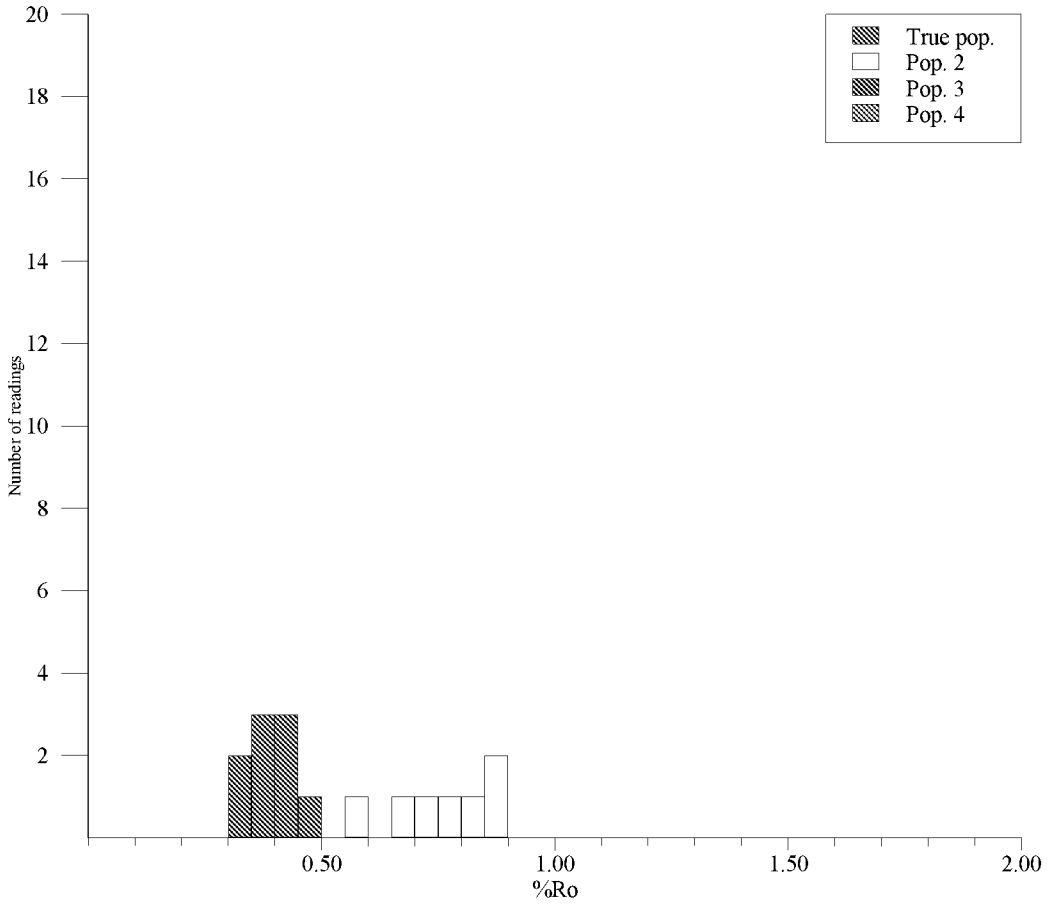
Average sample quality	M
Abundance of vitrinite	o
Identification of vitrinite	o
Type of vitrinite	-
Particle size	o
Particle surface quality	-
Abundance of pyrite	o

Legend to quality rating:

No effect on the readings	o
Possibly too low readings	-
Possibly too high readings	+
Good quality	G
Moderate quality	M
Poor quality	P
Not vitrinite	X
Hydrocarbon staining	St

%Ro readings	True pop.	Pop. 2	Pop. 3	Pop. 4
%Mean±sd.	0.41±0.04	0.22±0.01		
Individual	0.320	0.210		
measurements	0.350	0.220		
3	0.350	0.220		
4	0.350	0.240		
5	0.370			
6	0.370			
7	0.380			
8	0.390			
9	0.390			
10	0.400			
11	0.400			
12	0.410			
13	0.420			
14	0.430			
15	0.430			
16	0.430			
17	0.430			
18	0.450			
19	0.460			
20	0.460			
21	0.470			
22	0.470			
23				
24				
25				
26				

Comments:
Some vitrinite present, but AOM and bitumen dominate. Surfaces poor due to scratching by plucked pyrite.



Sample info:

Well	7220/8-1
Lower depth	1379.02
Sample type	COPL
Lithology	Clyst
Preparation	Bulk
Date of analysis	26.07.2011
APT ID	86175

Quality rating:

Average sample quality	P
Abundance of vitrinite	o
Identification of vitrinite	-
Type of vitrinite	-
Particle size	o
Particle surface quality	o
Abundance of pyrite	o

Legend to quality rating:

No effect on the readings	o
Possibly too low readings	-
Possibly too high readings	+
Good quality	G
Moderate quality	M
Poor quality	P
Not vitrinite	X
Hydrocarbon staining	St

%Ro readings	True pop.	Pop. 2	Pop. 3	Pop. 4
%Mean±sd.	0.39±0.04	0.76±0.10		
Individual	0.320	0.600		
measurements	0.340	0.680		
3	0.380	0.730		
4	0.380	0.750		
5	0.390	0.810		
6	0.410	0.850		
7	0.420	0.890		
8	0.430			
9	0.460			
10				
11				
12				
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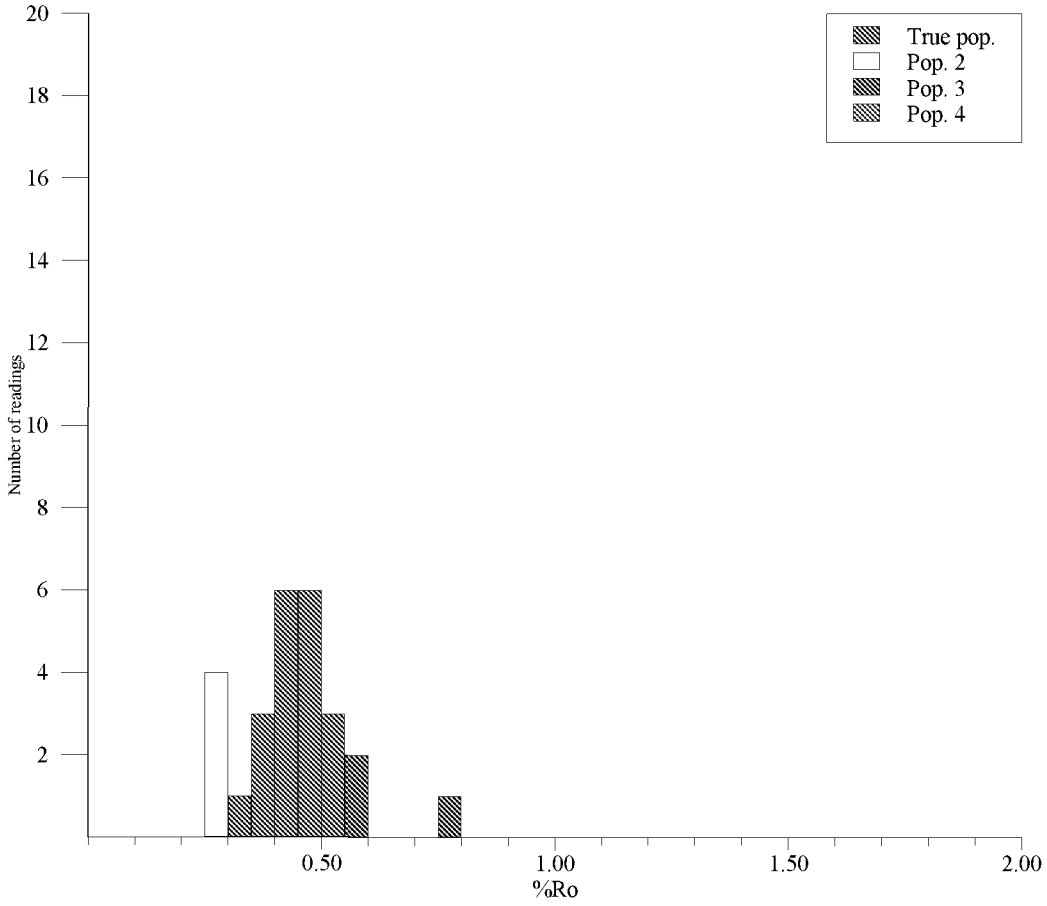
Comments:
Little terrestrial organic matter present and identification of "vitrnite" is uncertain.



Sample info:

Well	7220/8-1
Lower depth	1414
Sample type	DC
Lithology	Sst
Preparation	Bulk
Date of analysis	26.07.2011
APT ID	86176

Quality rating:

Average sample quality	M
Abundance of vitrinite	o
Identification of vitrinite	o
Type of vitrinite	o
Particle size	o
Particle surface quality	o
Abundance of pyrite	o

Legend to quality rating:

No effect on the readings	o
Possibly too low readings	-
Possibly too high readings	+
Good quality	G
Moderate quality	M
Poor quality	P
Not vitrinite	X
Hydrocarbon staining	St

%Ro readings	True pop.	Pop. 2	Pop. 3	Pop. 4
%Mean±sd.	0.44±0.05	0.27±0.01	0.64±0.12	
Individual	0.350	0.260	0.570	
measurements	0.360	0.270	0.570	
3	0.370	0.270	0.770	
4	0.390	0.270		
5	0.400			
6	0.410			
7	0.430			
8	0.430			
9	0.430			
10	0.440			
11	0.450			
12	0.450			
13	0.460			
14	0.470			
15	0.470			
16	0.490			
17	0.500			
18	0.500			
19	0.510			
20				
21				
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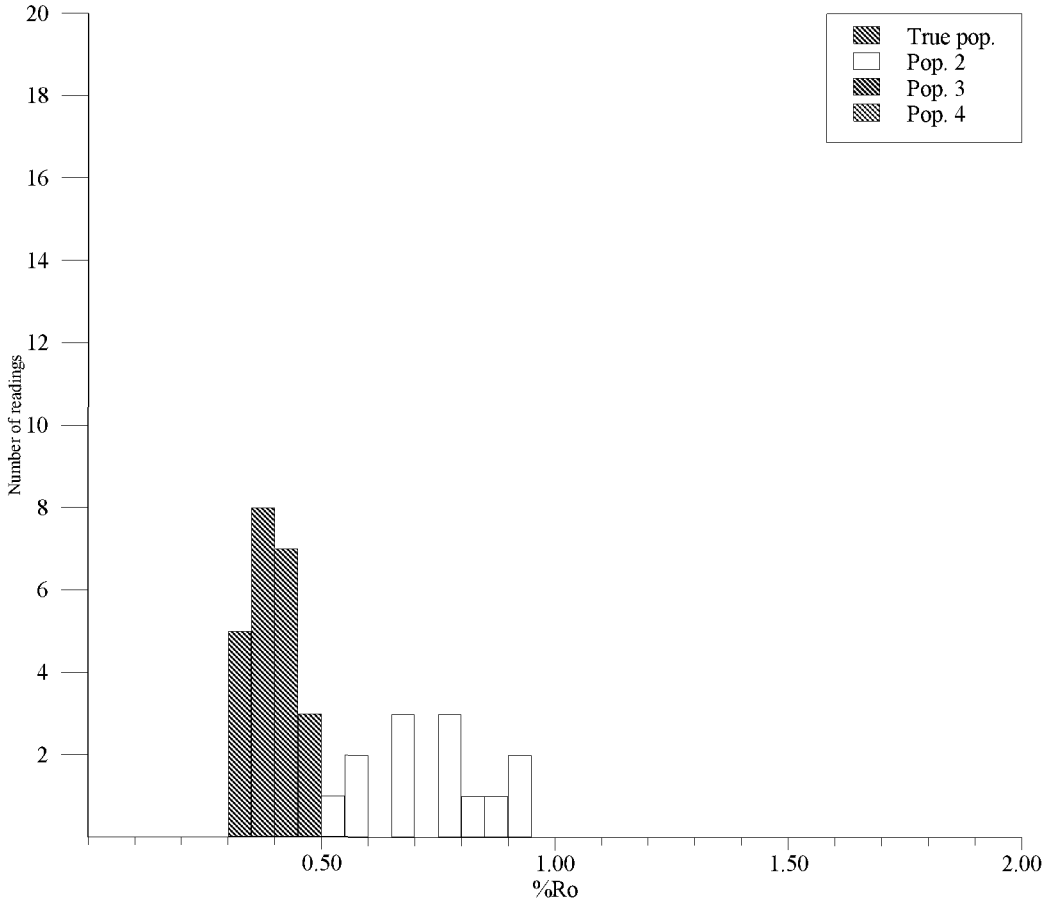
Comments:
Some good vitrinite, but also some low reflecting teliniite. Large blocks of pyrite replacing organic matter are present.



Sample info:

Well	7220/8-1
Lower depth	1459
Sample type	DC
Lithology	Sst
Preparation	Bulk
Date of analysis	08.02.2011
APT ID	86177

Quality rating:

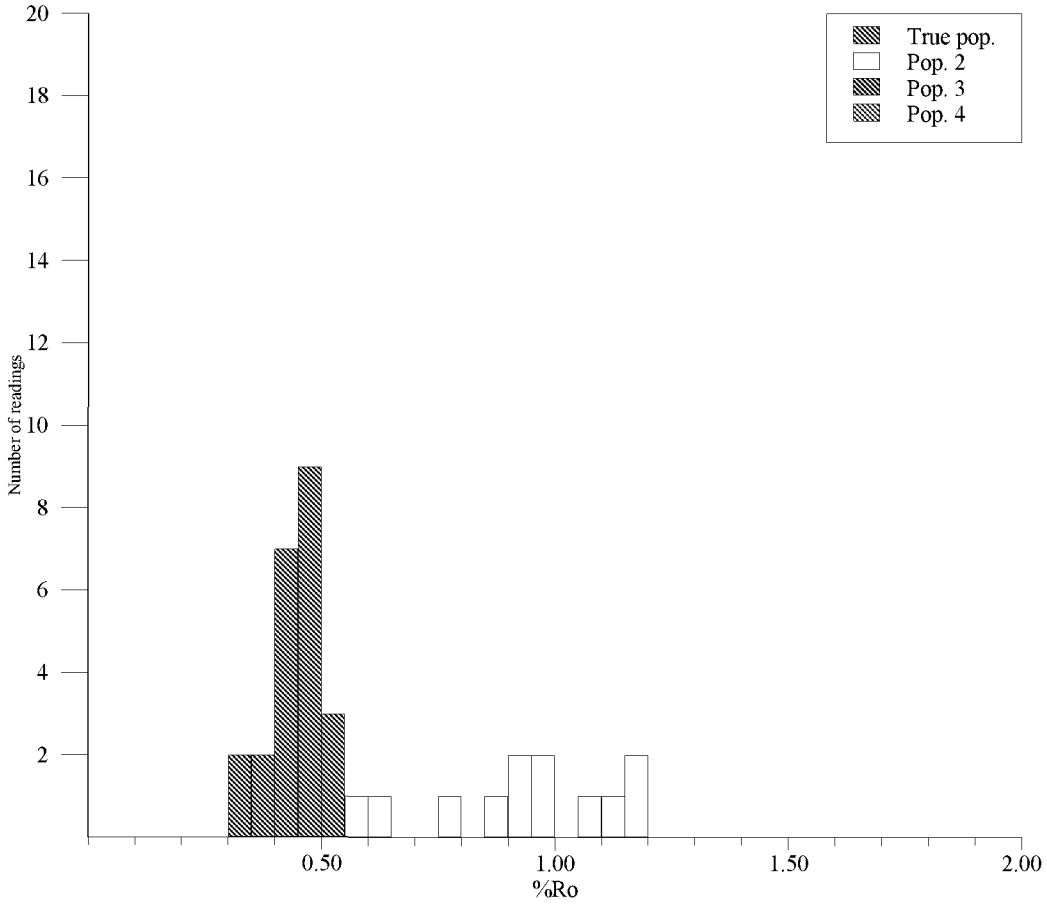
Average sample quality	M
Abundance of vitrinite	o
Identification of vitrinite	o
Type of vitrinite	o
Particle size	o
Particle surface quality	-
Abundance of pyrite	o

Legend to quality rating:

No effect on the readings	o
Possibly too low readings	-
Possibly too high readings	+
Good quality	G
Moderate quality	M
Poor quality	P
Not vitrinite	X
Hydrocarbon staining	St

%Ro readings	True pop.	Pop. 2	Pop. 3	Pop. 4
%Mean±sd.	0.40±0.05	0.75±0.12		
Individual	0.310	0.550		
measurements	0.320	0.600		
3	0.330	0.660		
4	0.340	0.680		
5	0.350	0.700		
6	0.370	0.760		
7	0.370	0.780		
8	0.370	0.790		
9	0.370	0.810		
10	0.380	0.890		
11	0.380	0.900		
12	0.380	0.910		
13	0.390			
14	0.400			
15	0.400			
16	0.420			
17	0.420			
18	0.430			
19	0.440			
20	0.440			
21	0.470			
22	0.480			
23	0.490			
24	0.500			
25				
26				

Comments:
Small amounts of good vitrinite are present but surfaces somewhat abraded.



Sample info:

Well	7220/8-1
Lower depth	1501
Sample type	DC
Lithology	Sst
Preparation	Bulk
Date of analysis	08.02.2011
APT ID	86178

Quality rating:

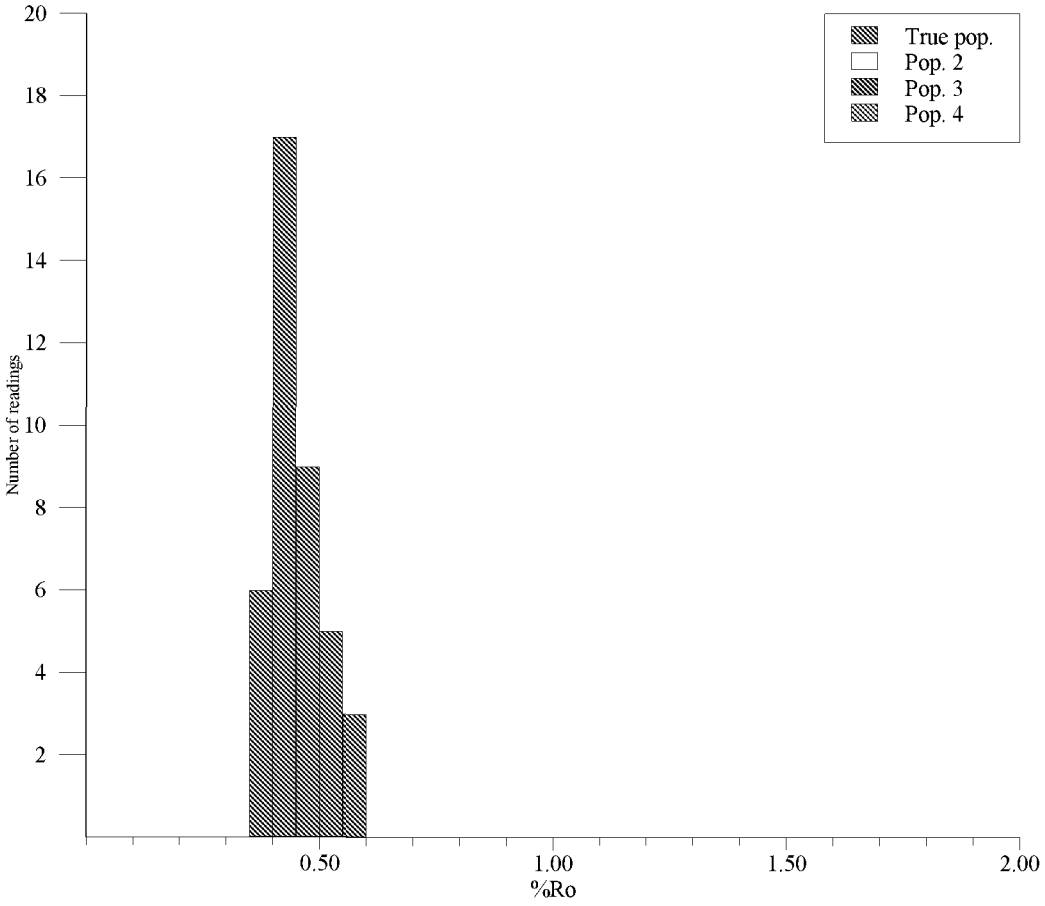
Average sample quality	G
Abundance of vitrinite	o
Identification of vitrinite	o
Type of vitrinite	o
Particle size	o
Particle surface quality	o
Abundance of pyrite	o

Legend to quality rating:

No effect on the readings	o
Possibly too low readings	-
Possibly too high readings	+
Good quality	G
Moderate quality	M
Poor quality	P
Not vitrinite	X
Hydrocarbon staining	St

%Ro readings	True pop.	Pop. 2	Pop. 3	Pop. 4
%Mean±sd.	0.44±0.05	0.93±0.19		
Individual	0.340	0.590		
measurements	0.350	0.640		
3	0.390	0.750		
4	0.390	0.860		
5	0.400	0.930		
6	0.400	0.950		
7	0.400	0.970		
8	0.410	0.990		
9	0.430	1.050		
10	0.440	1.140		
11	0.440	1.160		
12	0.450	1.160		
13	0.450			
14	0.450			
15	0.460			
16	0.460			
17	0.460			
18	0.460			
19	0.480			
20	0.490			
21	0.500			
22	0.510			
23	0.510			
24				
25				
26				

Comments:
Vitrinite abundance, although low, is sufficient, and preservation is good enough to provide reliable data.



Sample info:

Well	7220/8-1
Lower depth	1660
Sample type	DC
Lithology	Sst
Preparation	Bulk
Date of analysis	02.08.2011
APT ID	86179

Quality rating:

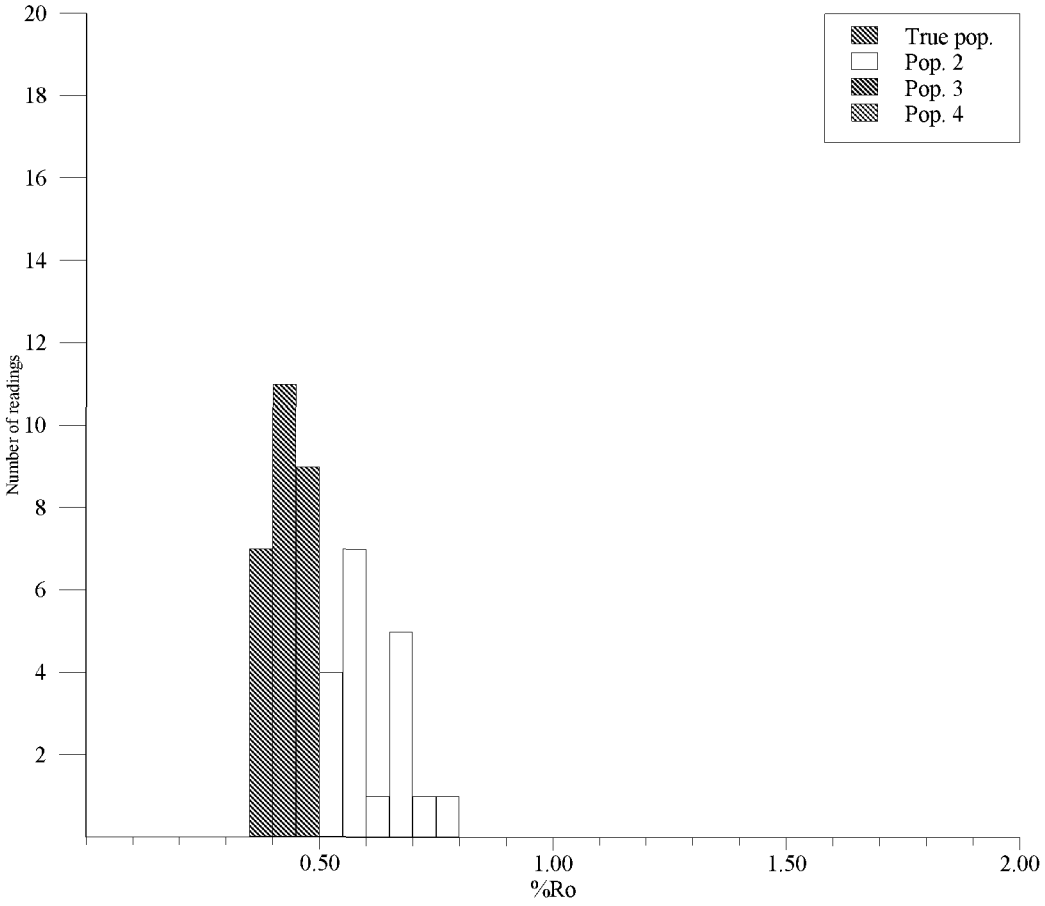
Average sample quality	G
Abundance of vitrinite	o
Identification of vitrinite	o
Type of vitrinite	o
Particle size	o
Particle surface quality	o
Abundance of pyrite	o

Legend to quality rating:

No effect on the readings	o
Possibly too low readings	-
Possibly too high readings	+
Good quality	G
Moderate quality	M
Poor quality	P
Not vitrinite	X
Hydrocarbon staining	St

%Ro readings	True pop.	Pop. 2	Pop. 3	Pop. 4
%Mean±sd.	0.45±0.06			
Individual	0.360 0.470			
measurements	0.360 0.470			
3	0.370 0.480			
4	0.380 0.480			
5	0.390 0.480			
6	0.390 0.490			
7	0.400 0.510			
8	0.400 0.520			
9	0.400 0.520			
10	0.400 0.520			
11	0.400 0.530			
12	0.400 0.550			
13	0.410 0.560			
14	0.410 0.570			
15	0.410			
16	0.420			
17	0.420			
18	0.430			
19	0.430			
20	0.440			
21	0.440			
22	0.440			
23	0.440			
24	0.450			
25	0.450			
26	0.460			

Comments:
Vitrinite more common than in previous sample and some very large particles are present.



Sample info:

Well	7220/8-1
Lower depth	1678
Sample type	DC
Lithology	Sst
Preparation	Bulk
Date of analysis	15.07.2011
APT ID	86180

Quality rating:

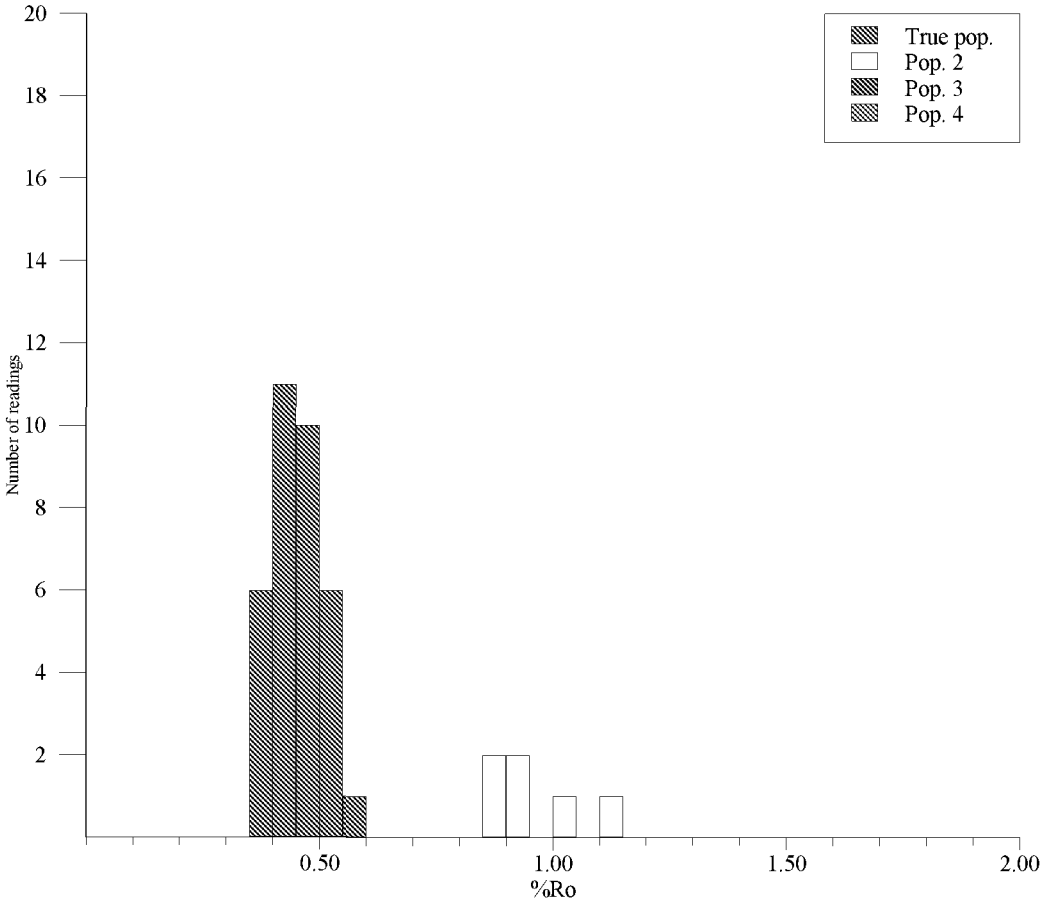
Average sample quality	G
Abundance of vitrinite	o
Identification of vitrinite	o
Type of vitrinite	o
Particle size	o
Particle surface quality	o
Abundance of pyrite	o

Legend to quality rating:

No effect on the readings	o
Possibly too low readings	-
Possibly too high readings	+
Good quality	G
Moderate quality	M
Poor quality	P
Not vitrinite	X
Hydrocarbon staining	St

%Ro readings	True pop.	Pop. 2	Pop. 3	Pop. 4
%Mean±sd.	0.43±0.04	0.62±0.07		
Individual	0.360 0.490	0.540		
measurements	0.360 0.510	0.540		
3	0.370 0.510	0.550		
4	0.380	0.550		
5	0.380	0.550		
6	0.380	0.560		
7	0.390	0.560		
8	0.400	0.570		
9	0.400	0.580		
10	0.400	0.640		
11	0.400	0.650		
12	0.400	0.660		
13	0.410	0.680		
14	0.420	0.690		
15	0.420	0.690		
16	0.420	0.740		
17	0.430	0.750		
18	0.440			
19	0.450			
20	0.460			
21	0.460			
22	0.470			
23	0.470			
24	0.470			
25	0.470			
26	0.470			

Comments:
Fair sample. Vitrinite not abundant but enough present for reasonable data.



Sample info:

Well	7220/8-1
Lower depth	1741
Sample type	DC
Lithology	Sst
Preparation	Bulk
Date of analysis	02.08.2011
APT ID	86181

Quality rating:

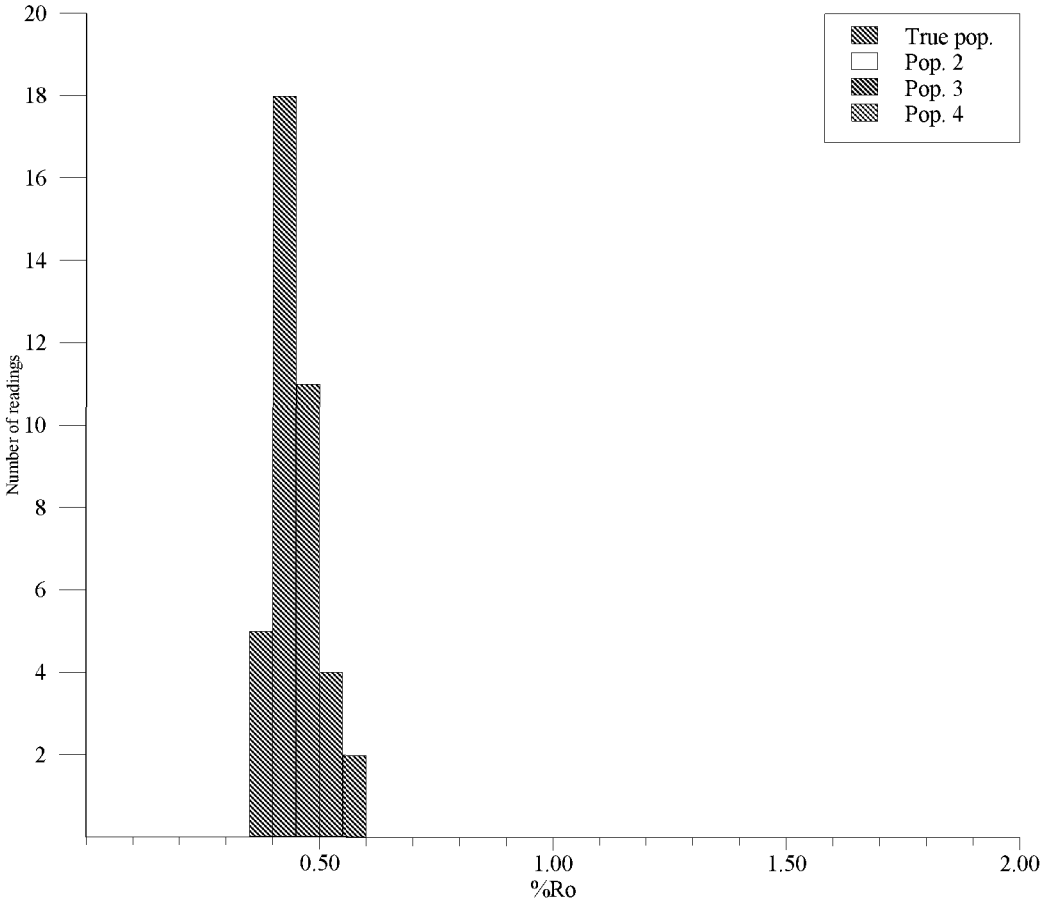
Average sample quality	M
Abundance of vitrinite	o
Identification of vitrinite	o
Type of vitrinite	o
Particle size	o
Particle surface quality	-
Abundance of pyrite	o

Legend to quality rating:

No effect on the readings	o
Possibly too low readings	-
Possibly too high readings	+
Good quality	G
Moderate quality	M
Poor quality	P
Not vitrinite	X
Hydrocarbon staining	St

%Ro readings	True pop.	Pop. 2	Pop. 3	Pop. 4
%Mean±sd.	0.45±0.05	0.96±0.11		
Individual	0.370	0.490	0.850	
measurements	0.370	0.500	0.860	
3	0.380	0.500	0.950	
4	0.380	0.500	0.950	
5	0.390	0.510	1.010	
6	0.390	0.520	1.140	
7	0.400	0.540		
8	0.410	0.570		
9	0.410			
10	0.420			
11	0.430			
12	0.430			
13	0.430			
14	0.430			
15	0.430			
16	0.440			
17	0.440			
18	0.450			
19	0.450			
20	0.450			
21	0.460			
22	0.460			
23	0.470			
24	0.470			
25	0.480			
26	0.480			

Comments:
Moderate amounts of vitrinite present, some quite large, but particle surface quality is poor.



Sample info:

Well	7220/8-1
Lower depth	1792
Sample type	DC
Lithology	Sst
Preparation	Bulk
Date of analysis	15.07.2011
APT ID	86182

Quality rating:

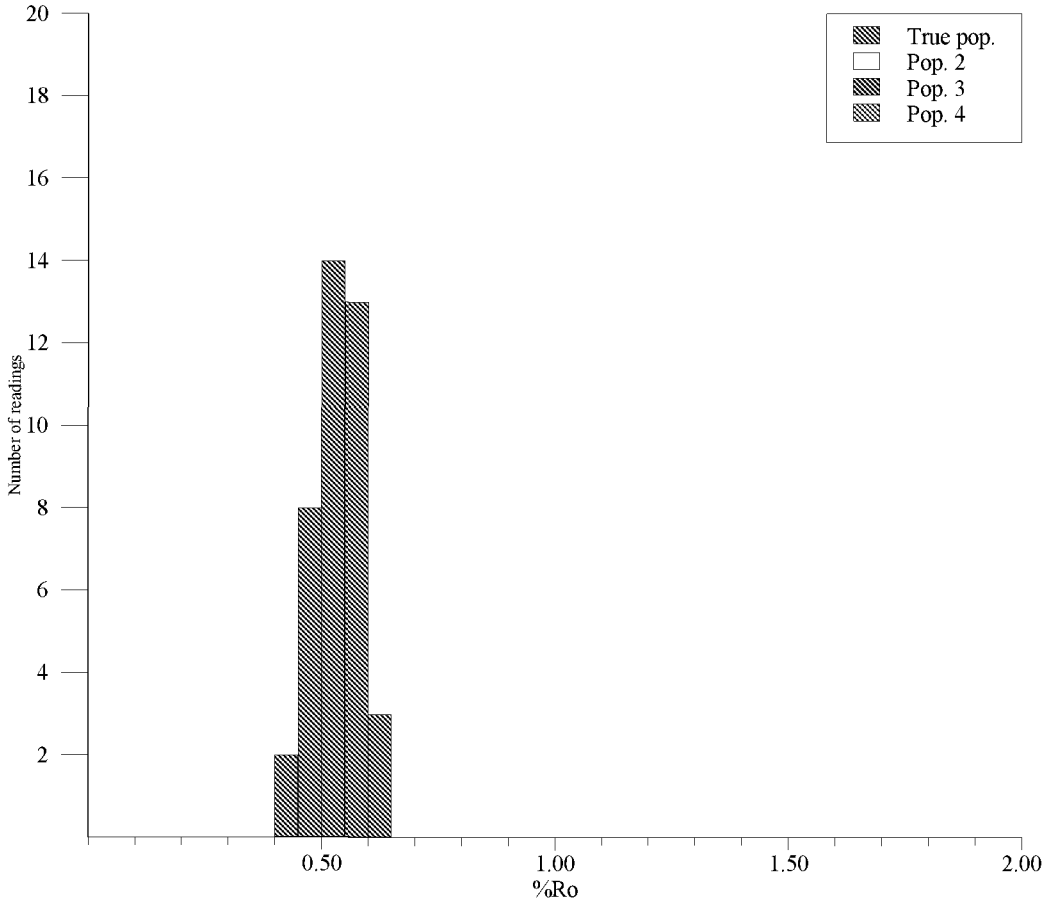
Average sample quality	M
Abundance of vitrinite	o
Identification of vitrinite	o
Type of vitrinite	o
Particle size	o
Particle surface quality	-
Abundance of pyrite	o

Legend to quality rating:

No effect on the readings	o
Possibly too low readings	-
Possibly too high readings	+
Good quality	G
Moderate quality	M
Poor quality	P
Not vitrinite	X
Hydrocarbon staining	St

%Ro readings	True pop.	Pop. 2	Pop. 3	Pop. 4
%Mean±sd.	0.44±0.05			
Individual	0.370 0.450			
measurements	0.370 0.450			
3	0.380 0.460			
4	0.380 0.460			
5	0.390 0.470			
6	0.410 0.480			
7	0.410 0.480			
8	0.410 0.490			
9	0.410 0.520			
10	0.410 0.520			
11	0.410 0.530			
12	0.410 0.530			
13	0.410 0.560			
14	0.420 0.560			
15	0.420			
16	0.420			
17	0.430			
18	0.430			
19	0.430			
20	0.430			
21	0.430			
22	0.440			
23	0.440			
24	0.450			
25	0.450			
26	0.450			

Comments:
Fair sample. Good unimodal population, but reflectance may have been reduced by weathered or oxidised surfaces.



Sample info:

Well	7220/8-1
Lower depth	1813
Sample type	DC
Lithology	Sst
Preparation	Bulk
Date of analysis	03.08.2011
APT ID	86183

Quality rating:

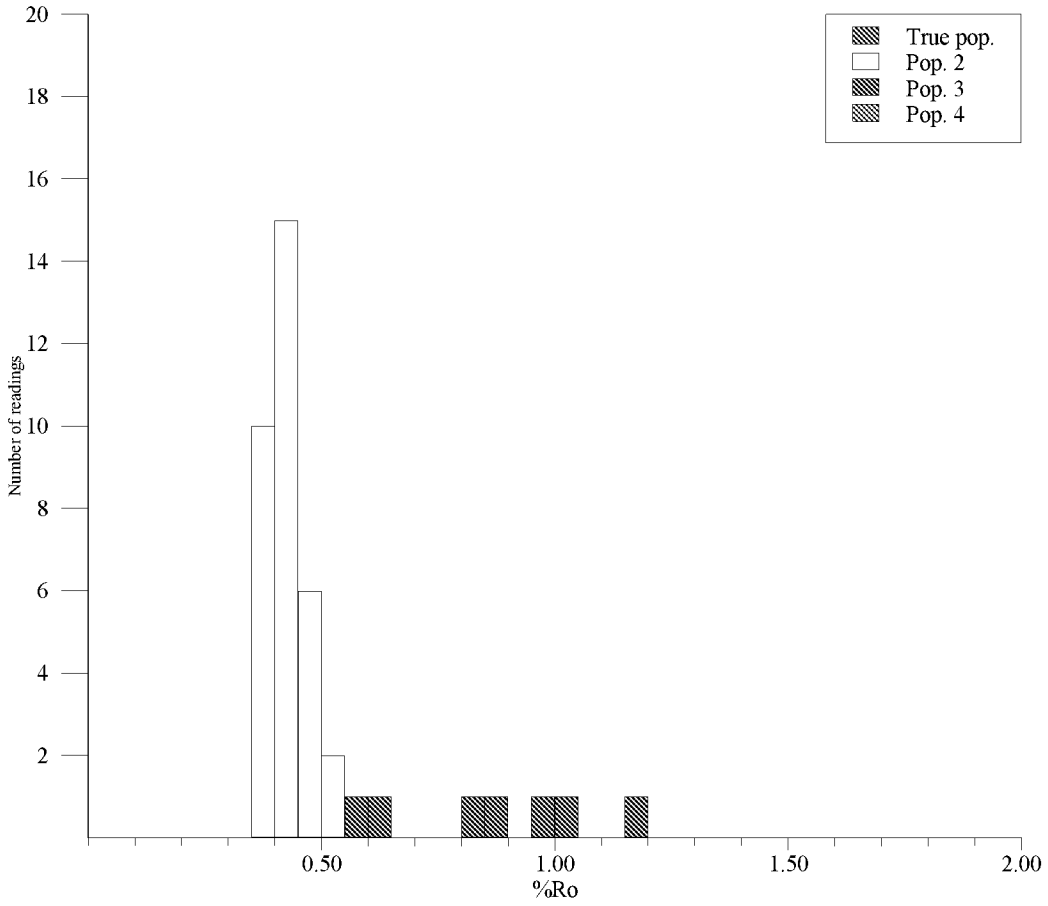
Average sample quality	G
Abundance of vitrinite	o
Identification of vitrinite	o
Type of vitrinite	o
Particle size	o
Particle surface quality	o
Abundance of pyrite	o

Legend to quality rating:

No effect on the readings	o
Possibly too low readings	-
Possibly too high readings	+
Good quality	G
Moderate quality	M
Poor quality	P
Not vitrinite	X
Hydrocarbon staining	St

%Ro readings	True pop.	Pop. 2	Pop. 3	Pop. 4
%Mean±sd.	0.53±0.05			
Individual	0.430 0.550			
measurements	0.430 0.550			
3	0.450 0.550			
4	0.450 0.550			
5	0.460 0.560			
6	0.460 0.560			
7	0.460 0.570			
8	0.490 0.580			
9	0.490 0.590			
10	0.490 0.600			
11	0.500 0.600			
12	0.500 0.620			
13	0.510 0.620			
14	0.510 0.640			
15	0.510			
16	0.510			
17	0.510			
18	0.520			
19	0.520			
20	0.520			
21	0.530			
22	0.530			
23	0.540			
24	0.540			
25	0.550			
26	0.550			

Comments:
Good sample. Abundant organic matter, much being vitrinite.



Sample info:

Well	7220/8-1
Lower depth	1891
Sample type	DC
Lithology	Sltst
Preparation	Bulk
Date of analysis	08.04.2011
APT ID	86184

Quality rating:

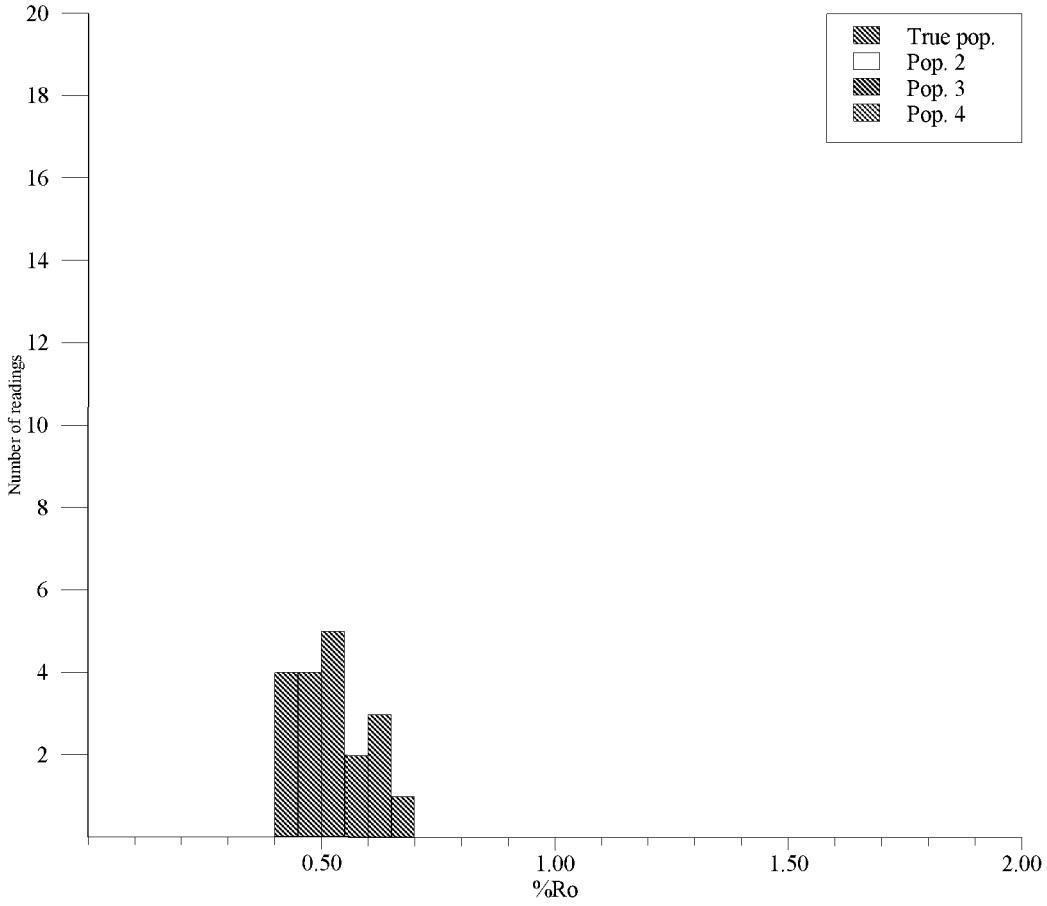
Average sample quality	G
Abundance of vitrinite	o
Identification of vitrinite	o
Type of vitrinite	o
Particle size	o
Particle surface quality	-
Abundance of pyrite	o

Legend to quality rating:

No effect on the readings	o
Possibly too low readings	-
Possibly too high readings	+
Good quality	G
Moderate quality	M
Poor quality	P
Not vitrinite	X
Hydrocarbon staining	St

%Ro readings	True pop.	Pop. 2	Pop. 3	Pop. 4
%Mean±sd.		0.42±0.04	0.86±0.21	
Individual		0.370 0.460	0.590	
measurements		0.380 0.460	0.610	
3		0.380 0.470	0.810	
4		0.380 0.480	0.870	
5		0.380 0.480	0.960	
6		0.380 0.500	1.030	
7		0.390 0.510	1.170	
8		0.390		
9		0.390		
10		0.390		
11		0.400		
12		0.400		
13		0.400		
14		0.410		
15		0.410		
16		0.420		
17		0.420		
18		0.430		
19		0.430		
20		0.440		
21		0.440		
22		0.440		
23		0.440		
24		0.440		
25		0.440		
26		0.460		

Comments:
Occasional good, large coaly particles, but may be caved.



Sample info:

Well	7220/8-1
Lower depth	1951
Sample type	DC
Lithology	Sltst
Preparation	Bulk
Date of analysis	08.04.2011
APT ID	86185

Quality rating:

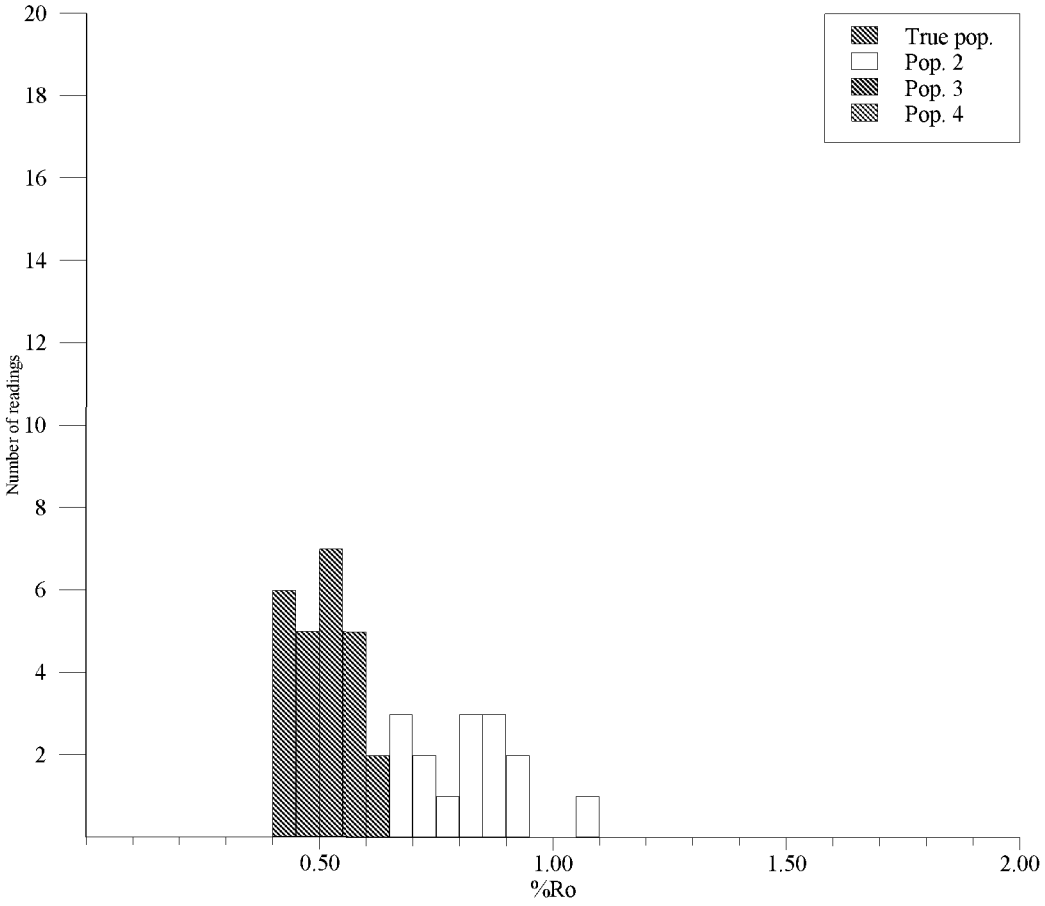
Average sample quality	M
Abundance of vitrinite	o
Identification of vitrinite	o
Type of vitrinite	o
Particle size	o
Particle surface quality	-
Abundance of pyrite	o

Legend to quality rating:

No effect on the readings	o
Possibly too low readings	-
Possibly too high readings	+
Good quality	G
Moderate quality	M
Poor quality	P
Not vitrinite	X
Hydrocarbon staining	St

%Ro readings	True pop.	Pop. 2	Pop. 3	Pop. 4
%Mean±sd.	0.52±0.08			
Individual	0.420			
measurements	0.420			
3	0.420			
4	0.430			
5	0.470			
6	0.470			
7	0.480			
8	0.490			
9	0.510			
10	0.520			
11	0.520			
12	0.520			
13	0.530			
14	0.600			
15	0.600			
16	0.610			
17	0.620			
18	0.630			
19	0.650			
20				
21				
22				
23				
24				
25				
26				

Comments:
Poor surfaces; badly corroded. Data of poor to fair quality.



Sample info:

Well	7220/8-1
Lower depth	2008
Sample type	DC
Lithology	Sltst
Preparation	Bulk
Date of analysis	08.04.2011
APT ID	86186

Quality rating:

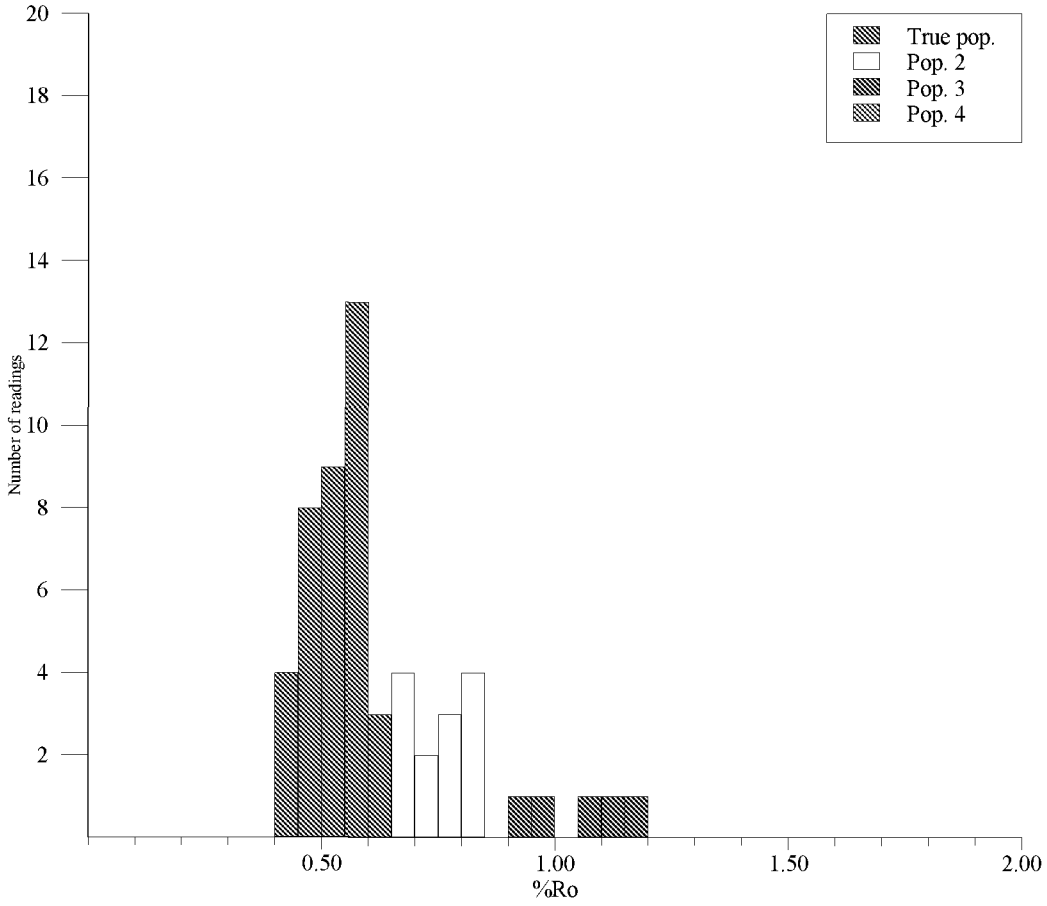
Average sample quality	G
Abundance of vitrinite	o
Identification of vitrinite	o
Type of vitrinite	o
Particle size	o
Particle surface quality	o
Abundance of pyrite	o

Legend to quality rating:

No effect on the readings	o
Possibly too low readings	-
Possibly too high readings	+
Good quality	G
Moderate quality	M
Poor quality	P
Not vitrinite	X
Hydrocarbon staining	St

%Ro readings	True pop.	Pop. 2	Pop. 3	Pop. 4
%Mean±sd.	0.51±0.07	0.81±0.11		
Individual	0.400	0.660		
measurements	0.410	0.670		
3	0.420	0.680		
4	0.430	0.710		
5	0.440	0.720		
6	0.440	0.770		
7	0.450	0.820		
8	0.460	0.830		
9	0.470	0.840		
10	0.490	0.850		
11	0.490	0.860		
12	0.510	0.880		
13	0.520	0.930		
14	0.520	0.950		
15	0.520	1.050		
16	0.530			
17	0.540			
18	0.540			
19	0.550			
20	0.550			
21	0.570			
22	0.580			
23	0.590			
24	0.620			
25	0.630			
26				

Comments:
Vitrinite very rare, but surfaces better than most and data are deemed reliable.



Sample info:

Well	7220/8-1
Lower depth	2056
Sample type	DC
Lithology	Sltst
Preparation	Bulk
Date of analysis	08.03.2011
APT ID	86187

Quality rating:

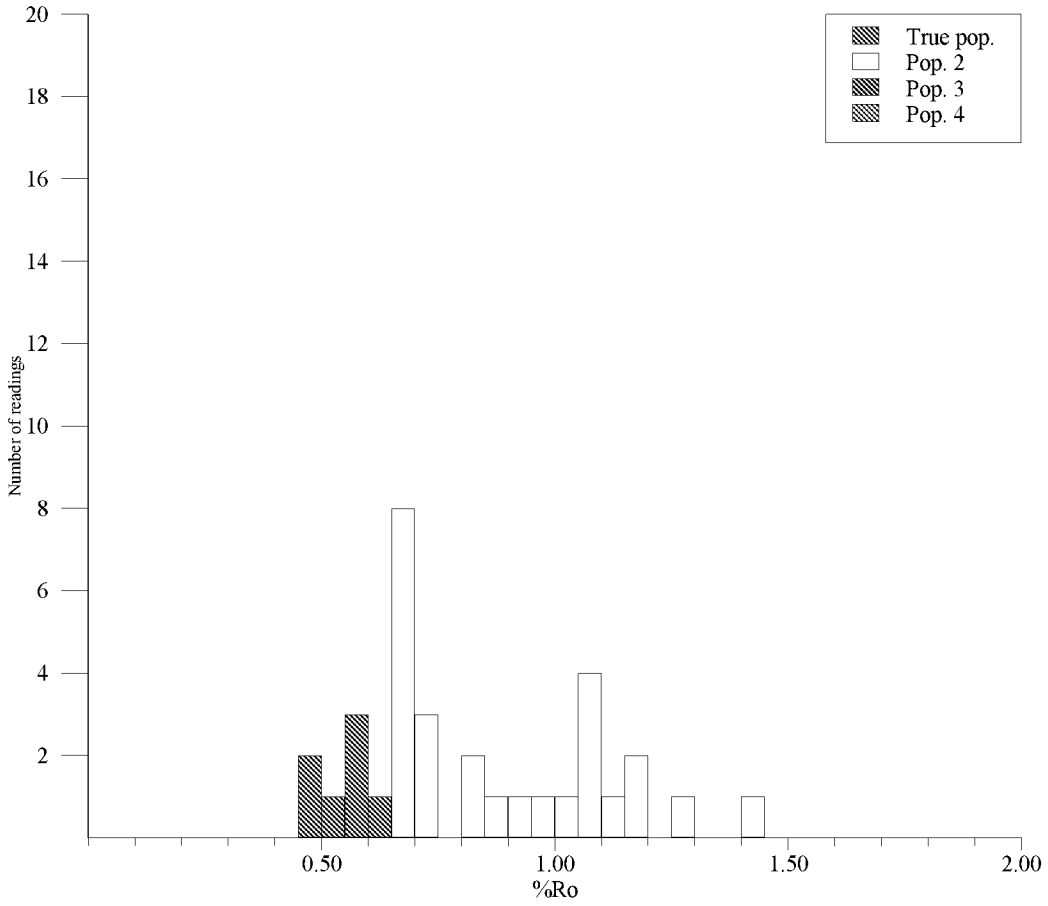
Average sample quality	M
Abundance of vitrinite	o
Identification of vitrinite	o
Type of vitrinite	+
Particle size	o
Particle surface quality	-
Abundance of pyrite	o

Legend to quality rating:

No effect on the readings	o
Possibly too low readings	-
Possibly too high readings	+
Good quality	G
Moderate quality	M
Poor quality	P
Not vitrinite	X
Hydrocarbon staining	St

%Ro readings	True pop.	Pop. 2	Pop. 3	Pop. 4
%Mean±sd.	0.53±0.06	0.74±0.06	1.06±0.12	
Individual	0.420 0.570	0.660	0.920	
measurements	0.430 0.590	0.660	0.970	
3	0.440 0.590	0.660	1.060	
4	0.440 0.590	0.670	1.150	
5	0.450 0.600	0.710	1.200	
6	0.460 0.600	0.730		
7	0.470 0.600	0.750		
8	0.470 0.600	0.760		
9	0.470 0.620	0.760		
10	0.480 0.630	0.800		
11	0.480 0.640	0.810		
12	0.490	0.810		
13	0.500	0.810		
14	0.500			
15	0.500			
16	0.520			
17	0.530			
18	0.530			
19	0.540			
20	0.540			
21	0.540			
22	0.550			
23	0.550			
24	0.560			
25	0.560			
26	0.570			

Comments:
Particles poorly preserved with a bireflective, mottled appearance; probably due to oxidation. Data moderate to poor; should be interpreted with caution.



Sample info:

Well	7220/8-1
Lower depth	2107
Sample type	DC
Lithology	Clyst
Preparation	Bulk
Date of analysis	03.08.2011
APT ID	86188

Quality rating:

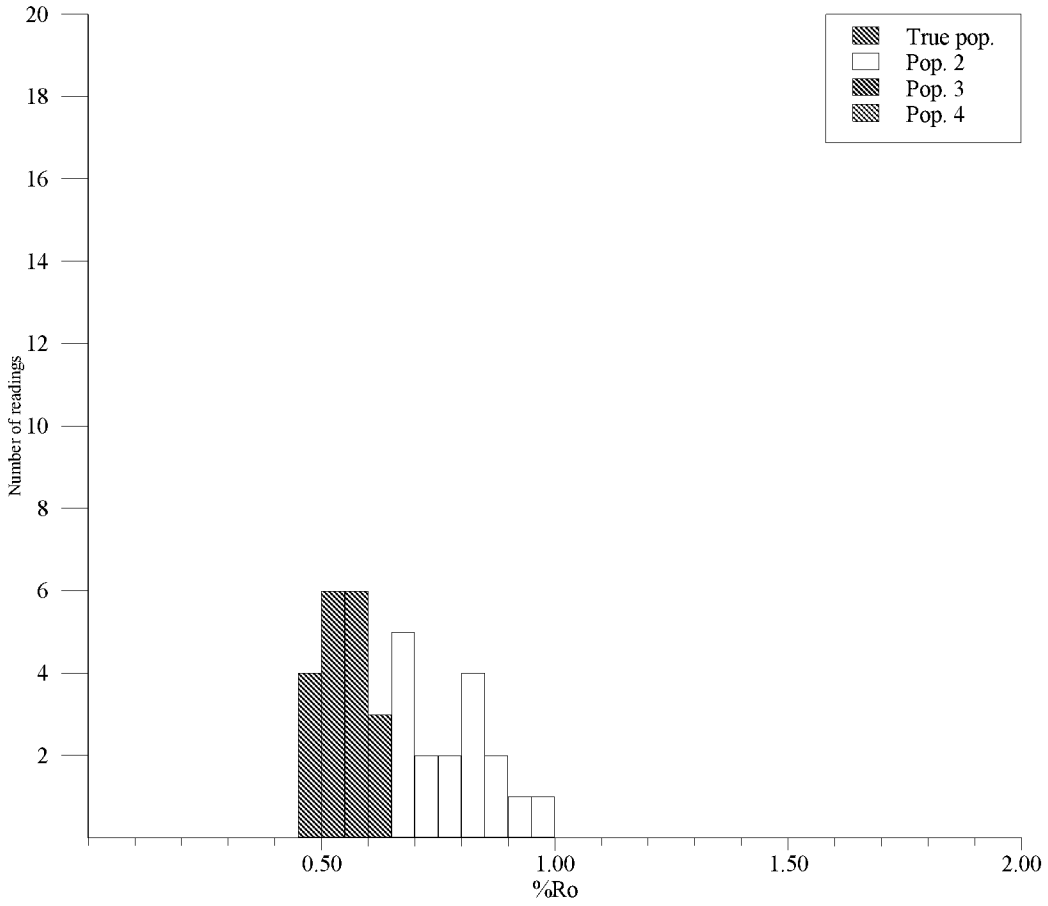
Average sample quality	P
Abundance of vitrinite	o
Identification of vitrinite	o
Type of vitrinite	o
Particle size	o
Particle surface quality	o
Abundance of pyrite	o

Legend to quality rating:

No effect on the readings	o
Possibly too low readings	-
Possibly too high readings	+
Good quality	G
Moderate quality	M
Poor quality	P
Not vitrinite	X
Hydrocarbon staining	St

%Ro readings	True pop.	Pop. 2	Pop. 3	Pop. 4
%Mean±sd.	0.55±0.06	0.90±0.23		
Individual	0.470	0.660		
measurements	0.480	0.660		
3	0.520	0.670		
4	0.560	0.670		
5	0.580	0.670		
6	0.590	0.690		
7	0.640	0.700		
8		0.700		
9		0.710		
10		0.720		
11		0.720		
12		0.830		
13		0.840		
14		0.860		
15		0.930		
16		0.960		
17		1.040		
18		1.050		
19		1.060		
20		1.080		
21		1.090		
22		1.100		
23		1.170		
24		1.200		
25		1.290		
26		1.430		

Comments:
Vitrinite extremely rare; bireflectance and mottling seen above are also present here and interpretation is uncertain.



Sample info:

Well	7220/8-1
Lower depth	2137
Sample type	DC
Lithology	Clyst
Preparation	Bulk
Date of analysis	03.08.2011
APT ID	86189

Quality rating:

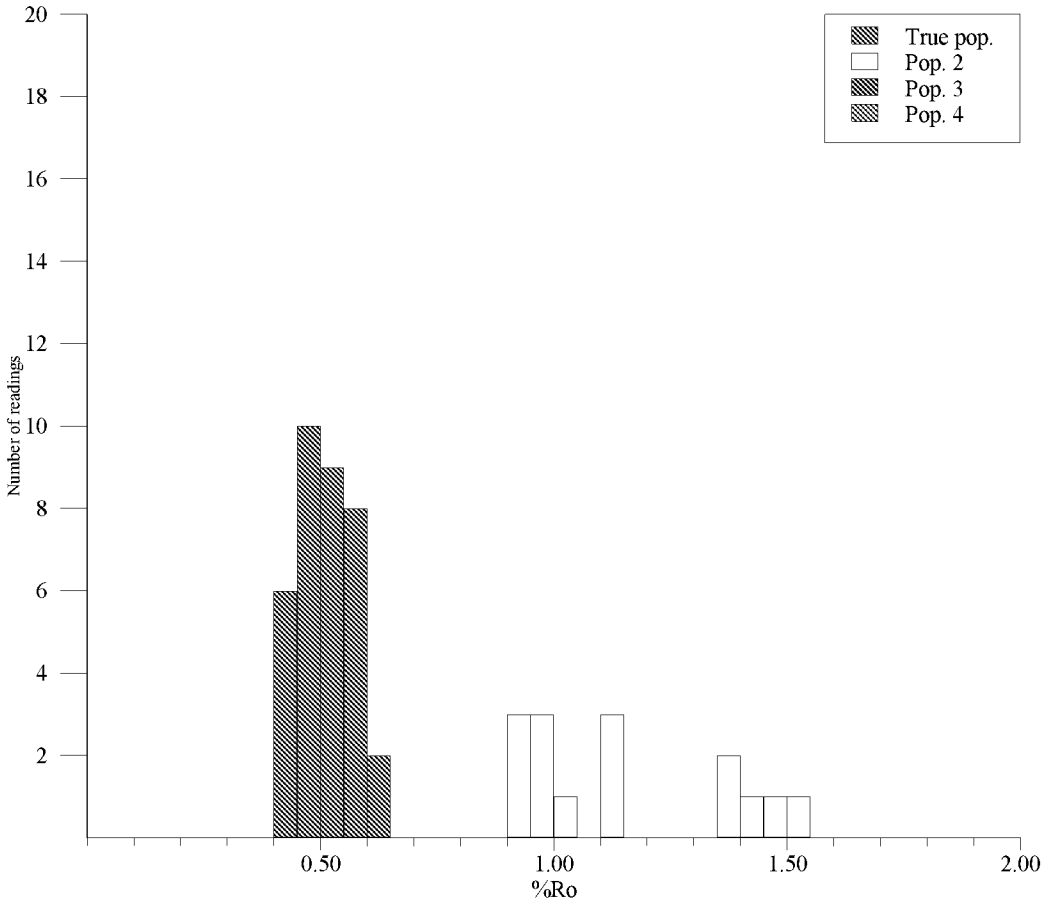
Average sample quality	P
Abundance of vitrinite	o
Identification of vitrinite	o
Type of vitrinite	+
Particle size	-
Particle surface quality	-
Abundance of pyrite	o

Legend to quality rating:

No effect on the readings	o
Possibly too low readings	-
Possibly too high readings	+
Good quality	G
Moderate quality	M
Poor quality	P
Not vitrinite	X
Hydrocarbon staining	St

%Ro readings	True pop.	Pop. 2	Pop. 3	Pop. 4
%Mean±sd.	0.55±0.06	0.79±0.09		
Individual	0.450	0.690		
measurements	0.490	0.690		
3	0.490	0.700		
4	0.490	0.700		
5	0.500	0.710		
6	0.500	0.740		
7	0.520	0.760		
8	0.530	0.760		
9	0.540	0.800		
10	0.540	0.800		
11	0.550	0.800		
12	0.560	0.810		
13	0.570	0.860		
14	0.580	0.870		
15	0.580	0.920		
16	0.600	0.980		
17	0.610			
18	0.630			
19	0.640			
20	0.660			
21				
22				
23				
24				
25				
26				

Comments:
Somewhat lower organic content and vitrinite is rare. Organic matter oxidised and poorly preserved.



Sample info:

Well	7220/8-1
Lower depth	2200
Sample type	DC
Lithology	Sst
Preparation	Bulk
Date of analysis	03.08.2011
APT ID	86190

Quality rating:

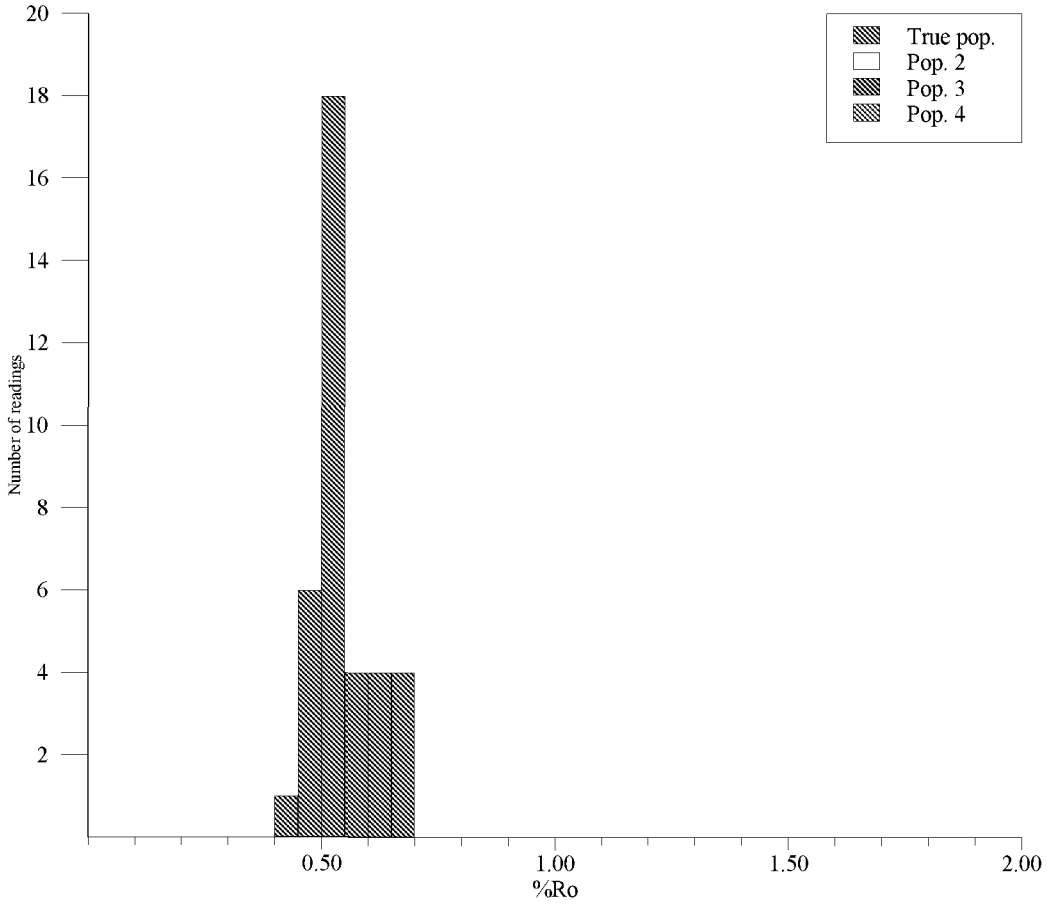
Average sample quality	M
Abundance of vitrinite	o
Identification of vitrinite	o
Type of vitrinite	o
Particle size	o
Particle surface quality	-
Abundance of pyrite	o

Legend to quality rating:

No effect on the readings	o
Possibly too low readings	-
Possibly too high readings	+
Good quality	G
Moderate quality	M
Poor quality	P
Not vitrinite	X
Hydrocarbon staining	St

%Ro readings	True pop.	Pop. 2	Pop. 3	Pop. 4
%Mean±sd.	0.50±0.06	1.15±0.22		
Individual	0.410 0.550	0.910		
measurements	0.410 0.550	0.910		
3	0.410 0.560	0.950		
4	0.420 0.560	0.960		
5	0.430 0.580	0.960		
6	0.440 0.580	0.980		
7	0.450 0.590	1.000		
8	0.460 0.620	1.110		
9	0.460 0.620	1.150		
10	0.470	1.150		
11	0.470	1.350		
12	0.470	1.370		
13	0.470	1.420		
14	0.470	1.470		
15	0.480	1.520		
16	0.490			
17	0.500			
18	0.500			
19	0.500			
20	0.500			
21	0.510			
22	0.510			
23	0.510			
24	0.510			
25	0.530			
26	0.550			

Comments:
Very little vitrinite preseint. Caved coaly particles present.



Sample info:

Well	7220/8-1
Lower depth	2221
Sample type	DC
Lithology	Sltst
Preparation	Bulk
Date of analysis	08.04.2011
APT ID	86191

Quality rating:

Average sample quality	M
Abundance of vitrinite	o
Identification of vitrinite	o
Type of vitrinite	o
Particle size	o
Particle surface quality	-
Abundance of pyrite	o

Legend to quality rating:

No effect on the readings	o
Possibly too low readings	-
Possibly too high readings	+
Good quality	G
Moderate quality	M
Poor quality	P
Not vitrinite	X
Hydrocarbon staining	St

%Ro readings	True pop.	Pop. 2	Pop. 3	Pop. 4
%Mean±sd.	0.54±0.07			
Individual	0.440 0.550			
measurements	0.460 0.560			
3	0.460 0.560			
4	0.460 0.610			
5	0.470 0.620			
6	0.480 0.630			
7	0.480 0.640			
8	0.500 0.650			
9	0.500 0.670			
10	0.500 0.690			
11	0.500 0.690			
12	0.500			
13	0.500			
14	0.510			
15	0.510			
16	0.510			
17	0.510			
18	0.520			
19	0.520			
20	0.520			
21	0.520			
22	0.520			
23	0.540			
24	0.540			
25	0.540			
26	0.550			

Comments:
Most, but not all surfaces are corroded, possibly reducing reflectance.

Experimental Procedures

All procedures follow NIGOGA, 4th Edition. Below are brief descriptions of procedures/analytical conditions.

GC analysis of gas components
Aliquots of the samples were transferred to exetainers. 0.1-1ml were sampled using a Gerstel MPS2 autosampler and injected into a Agilent 7890 RGA GC equipped with Molsieve and Poraplot Q columns, a flame ionisation detector (FID) and 2 thermal conductivity detector (TCD). Hydrocarbons were measured by FID. H_2, CO_2, N_2 and O_2/Ar by TCD.

Carbon isotope analysis of hydrocarbon compounds and CO2
The carbon isotopic composition of the hydrocarbon gas components was determined by a GC-C-IRMS system. Aliquots were sampled with a syringe and analysed on a Trace GC2000, equipped with a Poraplot Q column, connected to a Delta plus XP IRMS. The components were burnt to CO_2 and water in a 1000 °C furnace over Cu/Ni/Pt. The water was removed by Nafion membrane separation. Repeated analyses of standards indicate that the reproducibility of $\delta^{13}C$ values is better than 1 ‰ PDB (2 sigma).

Carbon isotope analysis of low concentration methane using the Precon.
The carbon isotopic composition of methane was determined by a Precon-IRMS system. Aliquots were sampled with a GCPal autosampler. CO_2, CO and water were removed on chemical traps. Other hydrocarbons than CH_4 and remaining traces of CO_2 were removed by cryotrapping. The methane was burnt to CO_2 and water in a 1000 °C furnace over Cu/Ni/Pt. The water was removed by Nafion membrane separation. The sample preparation system described (Precon) was connected to a Delta plus XP IRMS for $\delta^{13}C$ analysis. Repeated analyses of standards indicate that the reproducibility of $\delta^{13}C$ values is better than 1 ‰ PDB (2 sigma).

Hydrogen isotope analysis of methane
The hydrogen isotopic composition of methane was determined by a GC-C-IRMS system. Aliquots were sampled with a GCPal and analysed on a Trace GC2000, equipped with a Poraplot Q column, connected to a Delta plus XP IRMS. The components were decomposed to H_2 and coke in a 1400 °C furnace. The international standard NGS-2 and an in-house standard (Std A) were used for testing accuracy and precision. The "true" value of NGS-2 is given to –172.5 ‰ V-SMOW (http://deuterium.nist.gov/standards.html). Repeated analyses of standards indicate that the reproducibility of δD values is better than 10 ‰ PDB (2 sigma).

Stable carbon and hydrogen isotope analysis of fractions
The samples were dissolved in a known amount of dichloromethane, and 0.2 mg of the sample (or as much as possible) was transferred to a Zn capsule. The solvent was evaporated in an oven at 50 °C. The samples were then combusted in an EuroVector Elemental Analyser EA3028-IRMS at 1030 °C. The produced water is trapped on $Mg(ClO_4)_2$ and the CO_2 is flushed into a Horizon, Isotope Ratio mass spectrometer

(IRMS) from NU-Instruments. A standard (NGS NSO-1, topped oil) is analysed for each 10th sample. The $\delta^{13}C$ value obtained for this standard is –28.61‰ VPDB. The variation in the isotopic values for the standard by repeated analysis over a period of three years is ± 0.09‰.

$H_2O_{(g)}$ aliquot was reduced with $Zn_{(s)}$ to $H_{2(g)}$ and $ZnO_{(s)}$ in sealed, evacuated quartz vessels at 900 °C. The δD composition was determined by a Micromass Optima Isotope Ratio mass spectrometer (IRMS). Average analysed value for GISP from IAEA is δD_{VSMOW}= -189.71 ± 0.89 ‰ (one standard deviation). Given value from IAEA is -189.73 ± 0.9 ‰.

Vitrinite reflectance analysis

Reflected light studies were carried out using whole rock (bulk) samples, mounted in resin blocks and polished. The whole rock pieces were mixed with resin and allowed to set in moulds,.

The surface of the blocks was ground flat on carborundum papers using three dry grinding stages of 180, 240 and 600 grades of carborundum. Polishing was carried out in three stages; 5/20, 3/50 & gamma alumina on Selvyt cloths, using isopropanol as lubricant. This polishing was done by hand on stationary laps. The finished blocks were mounted on microscope slides using a hand press and a small lump of plasticine, which ensured that the polished surface was normal to the incident light.

Reflectivity studies were conducted with a Zeiss MPM 03 microscope with photometer installed. The optical magnification system uses an Epiplan - Neofluar x40 oil immersion objective and x10.0 eyepiece, with an inherent tube magnification of 1.6x giving a total visual magnification of x640. The immersion oil used was Zeiss Immersol 518F having a refractive index of 1.518 at 23°C. Measurements were made in light at a wavelength of 546nm (green) which is the ICCP standard. The measuring aperture was circular with a diameter of 1.6 micron.

Measurements made are of Ro. (aver.) which means they are made in polarised light; as against Ro. random which are made in nominally un-polarised light, although some degree of polarisation is imparted by the coated cover slip of the vertical illuminator. Two of three standards are used; Spinel, with a Ro. in oil of 0.588%, Yttrium-Aluminium-Garnet with a Ro. in oil of 0.879% and Gadolinium-Gallium-Garnet with a Ro. of 1.696%. The choice of standards used is dependent on the expected range of reflectance of the samples being examined. The two selected standards are used each time a sample is analysed; a high degree of linearity in photometer response (R^2 0.99 or 1.00) is expected and obtained before analysis commences.

The polished surface of the block is searched for vitrinite phytoclasts until 55 have been measured or for half an hour, whichever is the sooner. For each sample quality ratings are given to various important aspects, which may affect the measurements. These aspects are abundance of vitrinite, uncertainties in the identification of indigenous vitrinite, type of vitrinite, particle size, particle surface quality and abundance of pyrite. All the observations and data are recorded into a digital spreadsheet format for QC purposes.

The techniques used for evaluation of the form, habit and thermal exposure of hydrocarbon residues (bitumen) are essentially the same as for the measurement of vitrinite reflectivity.

Photomicrographs were obtained using a Canon EOS 1000D digital camera placed in the light path to the photomultiplier tube using a prism off take. The objective used for the photographic work was a 25x oil immersion objective which, with the same ocular magnification of 10x and the inherent tube magnification of 1.6x, gives a total magnification of 400x.