

Characterization of hydrocarbons extracted from two intervals in the North Aleutian COST No. 1 well as follows:

cuttings composited (15,700' – 16,800') as one sample, and
core composited (16,006.0' – 16,029' and 16,701.2' – 16,720') as one sample.



Received 23 January 2004

Total of 49 pages in report

Alaska Geologic Materials Center Data Report No. 309



BASELINE DGSi
ANALYTICAL LABORATORIES

**Characterization of
Hydrocarbons Extracted
From Two Intervals in the
North Aleutian COST 1 Well**

**Prepared For:
Minerals Management Service**

**Alaska Geological Materials
Center (AGMC) Report No. 309**

**P.O. Box 772805
18205 Fish Hatchery Road
Eagle River, AK
99577-2805
PH 907 696 0079**

**Performed By:
Baseline DGSi**

**Project: 03-529-A
November, 2003**

BASELINE DGSi, U.S.A.

BASELINE DGSi, Brasil

8701 New Trails Drive, The Woodlands, Texas 77381-4241, Tel: 281.681.2200, Fax: 281-681-0326
E-mail: info@baselinedgsi.com,
Rua Jardim Botânico 674 / 413, Jardim Botânico, 22460-030 Rio de Janeiro (RJ) - Brazil
Tel/Fax: + 55.21 / 2259.5992 E-mail: office@reslabsolintec.com.br
Web: <http://www.baselinedgsi.com>



Company: MINERALS MANAGEMENT SERVICE Project #: 03-529-A

Baseline/DGSI - USA
8701 New Trails Drive, The Woodlands, TX 77381-4241
Telephone: 281-681-2200
Facsimile: 281-681-0326
E-mail: info@baselinedgsi.com
Web Site: <http://www.baselinedgsi.com>

Baseline DGSi - Brazil
Rua Benjamin Batista 55 / 301 Jardim Botânico.
22461-120 Rio de Janeiro (RJ) - Brazil
Tel/Fax: + 55.21 / 537 7893
E-mail: ssp@solintec.com.br



SULFUR

Company: MINERALS MANAGEMENT SERVICE

Project #: 03-529-A

Baseline/DGSI - USA
8701 New Trails Drive, The Woodlands, TX 77381-4241
Telephone: 281-681-2200
Facsimile: 281-681-0326
E-mail: info@baselinedgsi.com
Web Site: <http://www.baselinedgsi.com>

Baseline DGSI - Brazil
Rua Benjamin Batista 55 / 301 Jardim Botânico.
22461-120 Rio de Janeiro (RJ) - Brazil
Tel/Fax: + 55.21 / 537 7893
E-mail: ssp@solinfec.com.br



Company: MINERALS MANAGEMENT

Project #: 03-529-A

Baseline/DGSI - USA
8701 New Trails Drive, The Woodlands, TX 77381-4241
Telephone: 281-681-2200
Facsimile: 281-681-0326
E-mail: info@baselinedgsi.com
Web Site: <http://www.baselinedgsi.com>

Baseline OGS1 - Brazil
Rua Benjamin Batista 55 / 301 Jardim Botânico.
22461-120 Rio de Janeiro (RJ) - Brazil
Tel/Fax: + 55.21 / 537 7893
E-mail: ssp@solintec.com.br



Company: MINERALS MANAGEMENT SERVICES

Project #: 03-529-A

Baseline/DGSI - USA
8701 New Trails Drive, The Woodlands, TX 77381-4241
Telephone: 281-681-2200
Facsimile: 281-681-0326
E-mail: info@baseline-dgsi.com
Web Site: <http://www.basinedgsi.com>

Baseline DGSI - Brazil
Rua Benjamin Ballista 55 / 301 Jardim Botânico,
22461-120 Rio de Janeiro (RJ) - Brazil
Tel/Fax: +55.21 / 537 7893
E-mail: ssp@soinftec.com.br

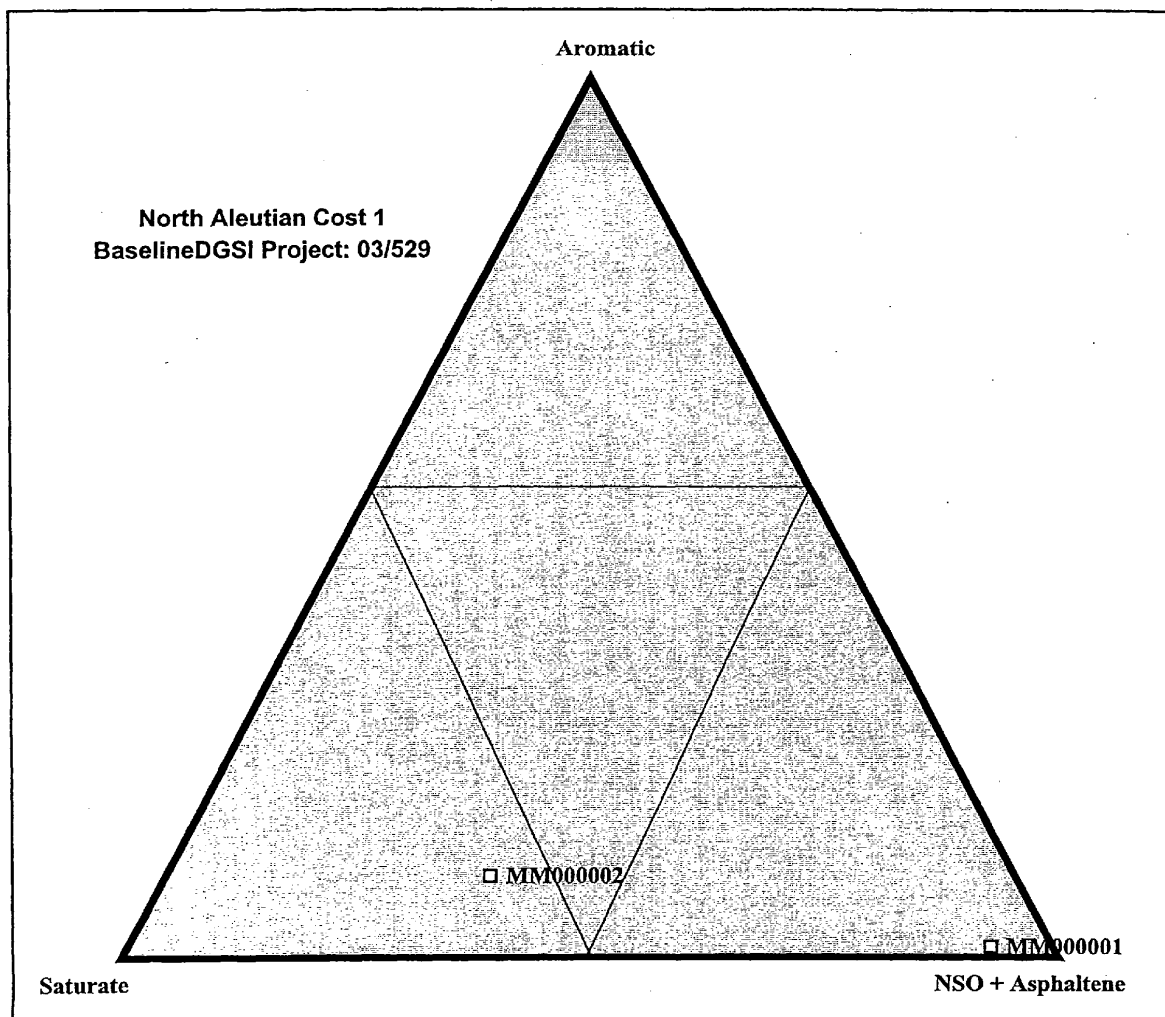


FIGURE 3 - Distribution of major compound groups from liquid chromatography data.



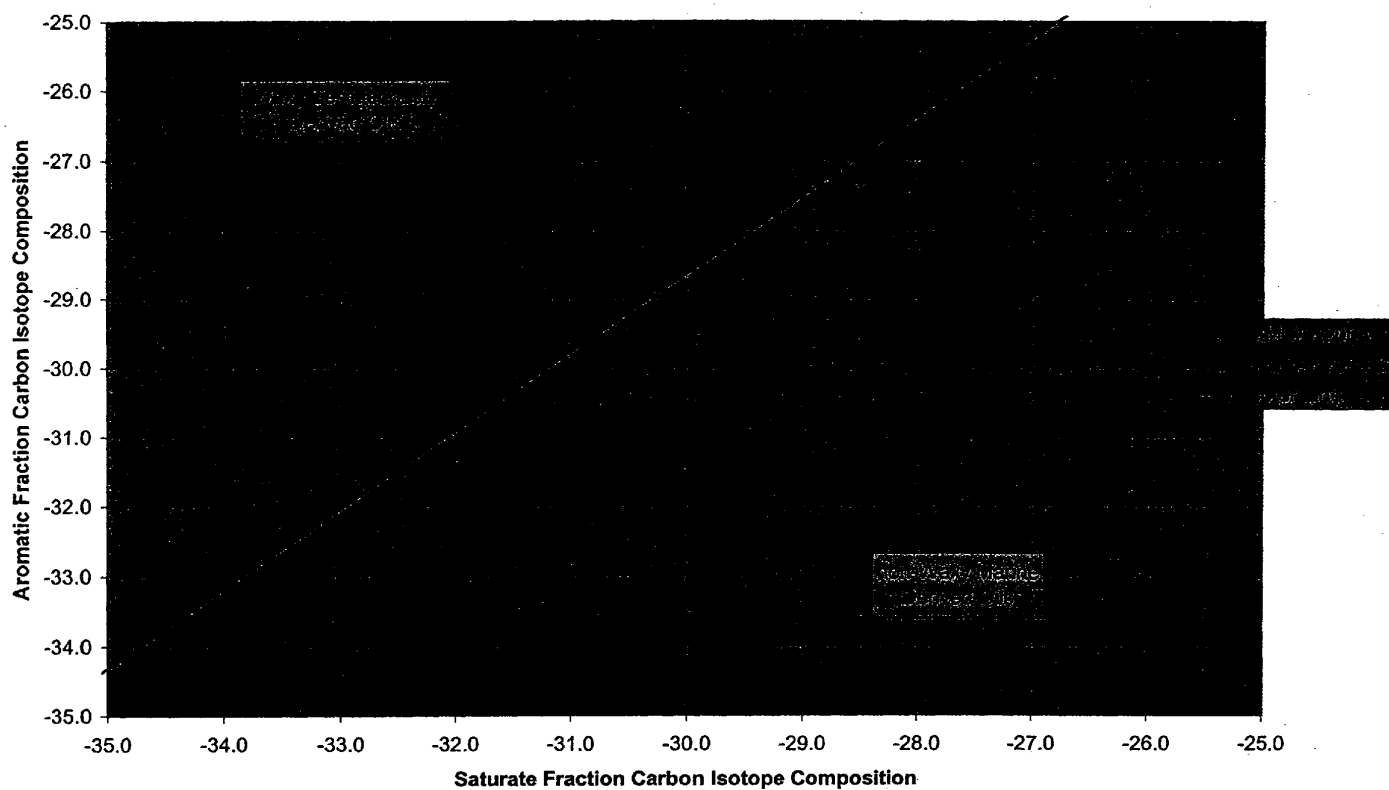
Company: MINERALS MANAGEMENT SERVICES

Project #: 03-529-A

BaseLine/DGSI - USA
8701 New Trails Drive, The Woodlands, TX 77381-4241
Telephone: 281-681-2200
Facsimile: 281-681-0326
E-mail: info@baselinedgsi.com
Web Site: <http://www.baselinedgsi.com>

Baseline DGS1 - Brazil
Rua Benjamin Batista 55 / 301 Jardim Botânico,
22461-120 Rio de Janeiro (RJ) - Brazil
Tel/Fax: + 55.21 / 537 7893
E-mail: ssp@solintec.com.br

**Carbon Isotope Composition of Extracted Hydrocarbons from the North Aleutian Basin COST
1 Well**



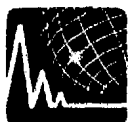
WHOLE EXTRACT GAS CHROMATOGRAPHY

North Aleutian Cost 1

BaselineDGSi Project: 03/529

ID	Sample Identification		TOC Wt%	PPM	Ext./TOC	GAS CHROMATOGRAPHY RATIOS			OEP
	Depth(Feet)					Pr/Ph	Pr/C17	Ph/C18	
MM000001	: MMSAK2003-1		N.A.	648	N.A.	2.6	0.45	0.19	1.10
MM000002	: MMSAK200: 15700		N.A.	1164	N.A.	3.7	0.83	0.23	1.22
		16800							
ID	Sample Weight	Extract Weight	C17	Pr	C18	AREA DATA Ph	C28	C29	C30
MM000001	: 53.5362	0.0347	104613	47231	95257	17843	31740	28748	20578
MM000002	: 52.3323	0.0609	109244	90946	104231	24276	49461	49531	31843

ID	Sample Identification		NORMALIZED ISOPRENOID PERCENT						
	Depth(Feet)		IC13	IC14	IC15	IC16	IC18	IC19	IC20
MM000001	: MMSAK2003-1		1.2	2.9	12.0	22.1	16.9	32.6	12.3
MM000002	: MMSAK200: 15700		1.3	3.3	10.6	18.6	15.3	40.2	10.7
		16800							
ID	Sample Identification	Depth(Feet)	IC13	IC14	IC15	AREA DATA IC16	IC18	IC19	IC20
MM000001	: MMSAK2003-1		1746	4180	17363	32010	24546	47231	17843
MM000002	: MMSAK200: 15700	16800	2904	7435	24051	42050	34626	90946	24276



BASLINE DGS

ANALYTICAL LABORATORIES

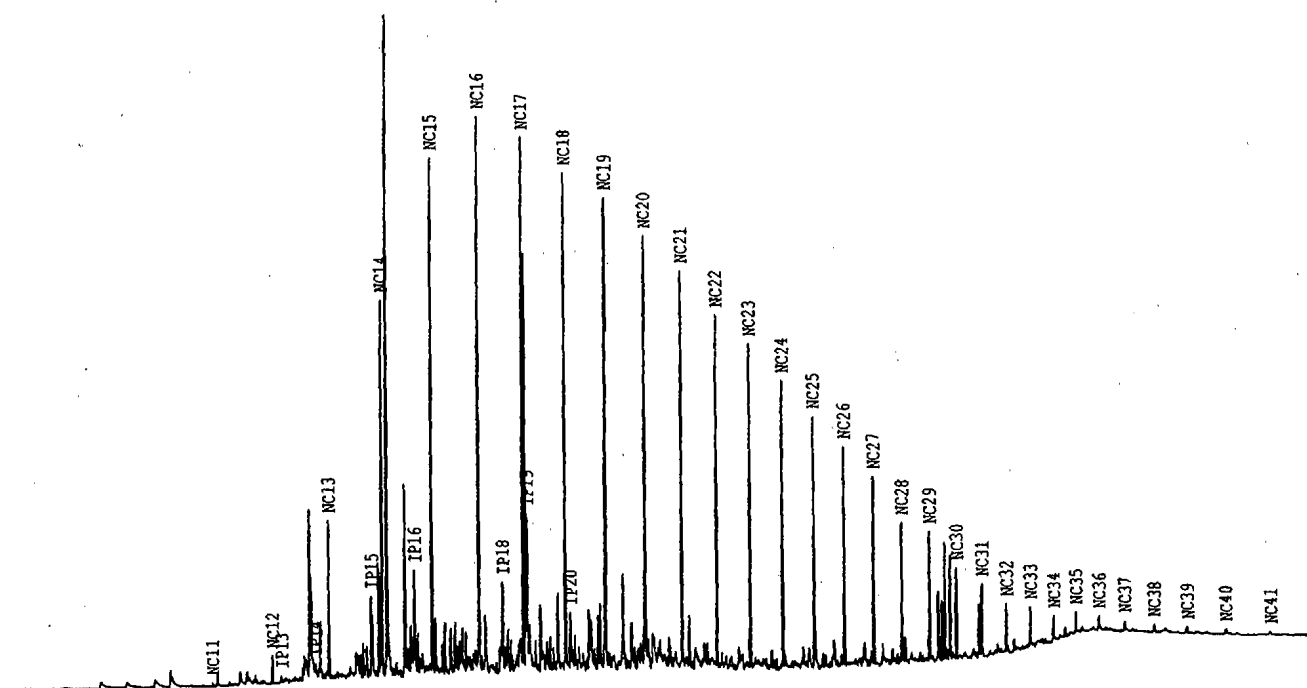
EXTRACT GC

Company: MINERALS MANAGEMENT SERVICES
Country: UNITED STATES
Basin:
Lease:
Block:
Field:
Well Name: NORTH ALEUTIAN COST 1
Latitude:
Longitude:

Client ID: MMSAK2003-1
Project #: 03-529-A
Lab ID: MM000001
Sample Type: CORE
Sampling Point:
Formation:
Geologic Age:
Top Depth:
Bottom Depth:

Extract GC Trace

G2030480.D



EGC parameters

Ratios

Pristane/Phytane	2.65
Pristane/ nC_{17}	0.45
Phytane/ nC_{18}	0.19
nC_{18}/nC_{19}	0.96
nC_{17}/nC_{29}	3.64
CPI Marzi ⁴	1.03

EGC parameters

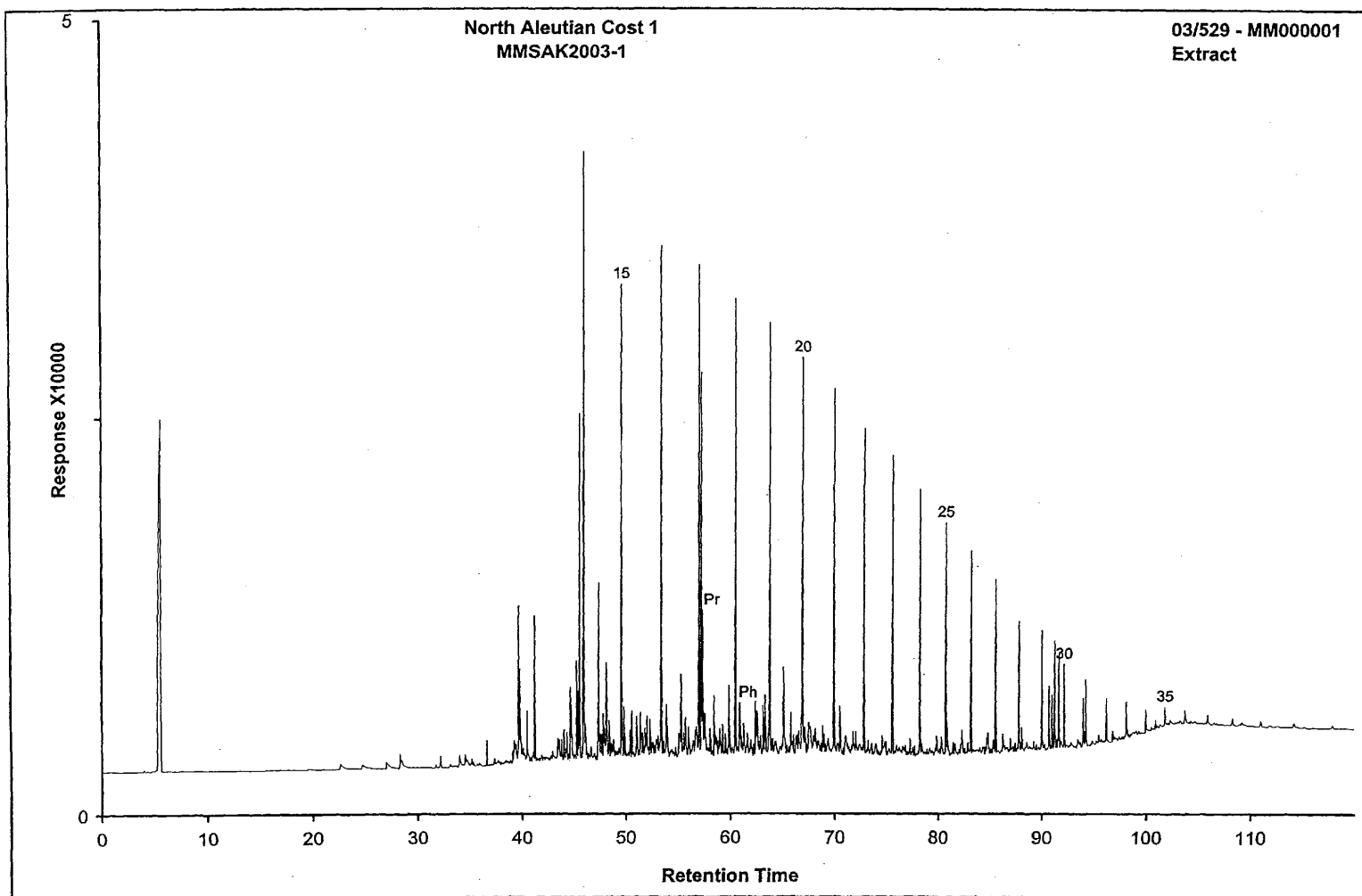
Resolved Components (%)

Normal Paraffins	34.9
Isoprenoids	4.0
Resolved unknowns	61.1

Company: MINERALS MANAGEMENT SERVICES
Well Name: NORTH ALEUTIAN COST 1
Depth: -
Sampling Point:

Client ID: MMSAK2003-1
Project #: 03-529-A
Lab ID: MM000001
File Name: G2030480.D

Peak Label	Compound Name	Ret. Time	Area	Height	Area%	Hght%
NC9	Normal Alkane C9					
NC10	Normal Alkane C10					
IP11	Isoprenoid C11					
NC11	Normal Alkane C11	31.708	817	220	0.02	0.02
NC12	Normal Alkane C12	36.593	5054	1637	0.14	0.18
IP13	Isoprenoid C13	37.322	1746	437	0.05	0.05
IP14	Isoprenoid C14	40.069	4180	985	0.12	0.11
NC13	Normal Alkane C13	41.175	27674	9270	0.76	1.05
IP15	Isoprenoid C15	44.622	17363	4718	0.48	0.53
NC14	Normal Alkane C14	45.497	70196	21822	1.94	2.46
IP16	Isoprenoid C16	48.127	32010	6189	0.88	0.70
NC15	Normal Alkane C15	49.560	101990	29961	2.82	3.38
NC16	Normal Alkane C16	53.402	106552	32328	2.94	3.64
IP18	Isoprenoid C18	55.308	24546	5290	0.68	0.60
NC17	Normal Alkane C17	57.042	104613	30985	2.89	3.49
IP19	Isoprenoid C19 (Pristane)	57.388	47231	9224	1.30	1.04
NC18	Normal Alkane C18	60.498	95257	28841	2.63	3.25
IP20	Isoprenoid C20 (Phytane)	60.881	17843	3415	0.49	0.38
NC19	Normal Alkane C19	63.790	99155	27370	2.74	3.09
NC20	Normal Alkane C20	66.929	90253	25205	2.49	2.84
NC21	Normal Alkane C21	69.929	80527	23102	2.22	2.60
NC22	Normal Alkane C22	72.799	72224	20525	2.00	2.31
NC23	Normal Alkane C23	75.548	67727	18963	1.87	2.14
NC24	Normal Alkane C24	78.191	58695	16749	1.62	1.89
NC25	Normal Alkane C25	80.732	51570	14724	1.42	1.66
NC26	Normal Alkane C26	83.175	44409	12789	1.23	1.44
NC27	Normal Alkane C27	85.532	39092	11038	1.08	1.24
NC28	Normal Alkane C28	87.806	31740	8200	0.88	0.92
NC29	Normal Alkane C29	90.008	28748	7604	0.79	0.86
NC30	Normal Alkane C30	92.128	20578	5381	0.57	0.61
NC31	Normal Alkane C31	94.183	16968	4305	0.47	0.49
NC32	Normal Alkane C32	96.172	11001	2859	0.30	0.32
NC33	Normal Alkane C33	98.110	10132	2368	0.28	0.27
NC34	Normal Alkane C34	99.978	6458	1514	0.18	0.17
NC35	Normal Alkane C35	101.806	5841	1294	0.16	0.15
NC36	Normal Alkane C36	103.709	3816	831	0.11	0.09
NC37	Normal Alkane C37	105.824	3346	630	0.09	0.07
NC38	Normal Alkane C38	108.230	2954	474	0.08	0.05
NC39	Normal Alkane C39	110.971	2673	381	0.07	0.04
NC40	Normal Alkane C40	114.158	2770	295	0.08	0.03
NC41	Normal Alkane C41	117.862	1947	206	0.05	0.02





BASLINE DGS

ANALYTICAL LABORATORIES

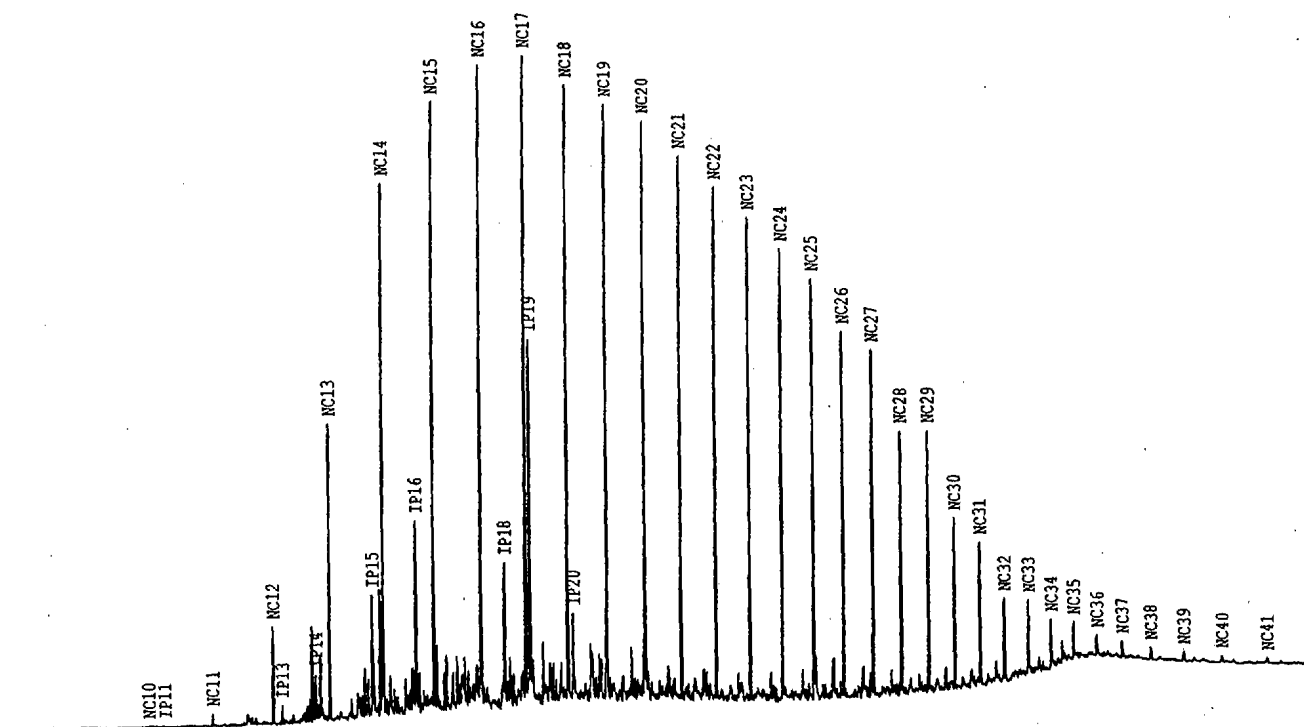
EXTRACT GC

Company: MINERALS MANAGEMENT SERVICES
Country: UNITED STATES
Basin:
Lease:
Block:
Field:
Well Name: NORTH ALEUTIAN COST 1
Latitude:
Longitude:

Client ID: MMSAK2003-2
Project #: 03-529-A
Lab ID: MM000002
Sample Type: CUTTINGS
Sampling Point:
Formation:
Geologic Age:
Top Depth: 15700 FT
Bottom Depth: 16800 FT

Extract GC Trace

G2030481.D



EGC parameters

Ratios

Pristane/Phytane	3.75
Pristane/ <i>n</i> C ₁₇	0.83
Phytane/ <i>n</i> C ₁₈	0.23
<i>n</i> C ₁₆ / <i>n</i> C ₁₈	1.03
<i>n</i> C ₁₇ / <i>n</i> C ₂₉	2.21
CPI Marzi ⁴	1.07

EGC parameters

Resolved Components (%)

Normal Paraffins	46.1
Isoprenoids	6.6
Resolved unknowns	47.2

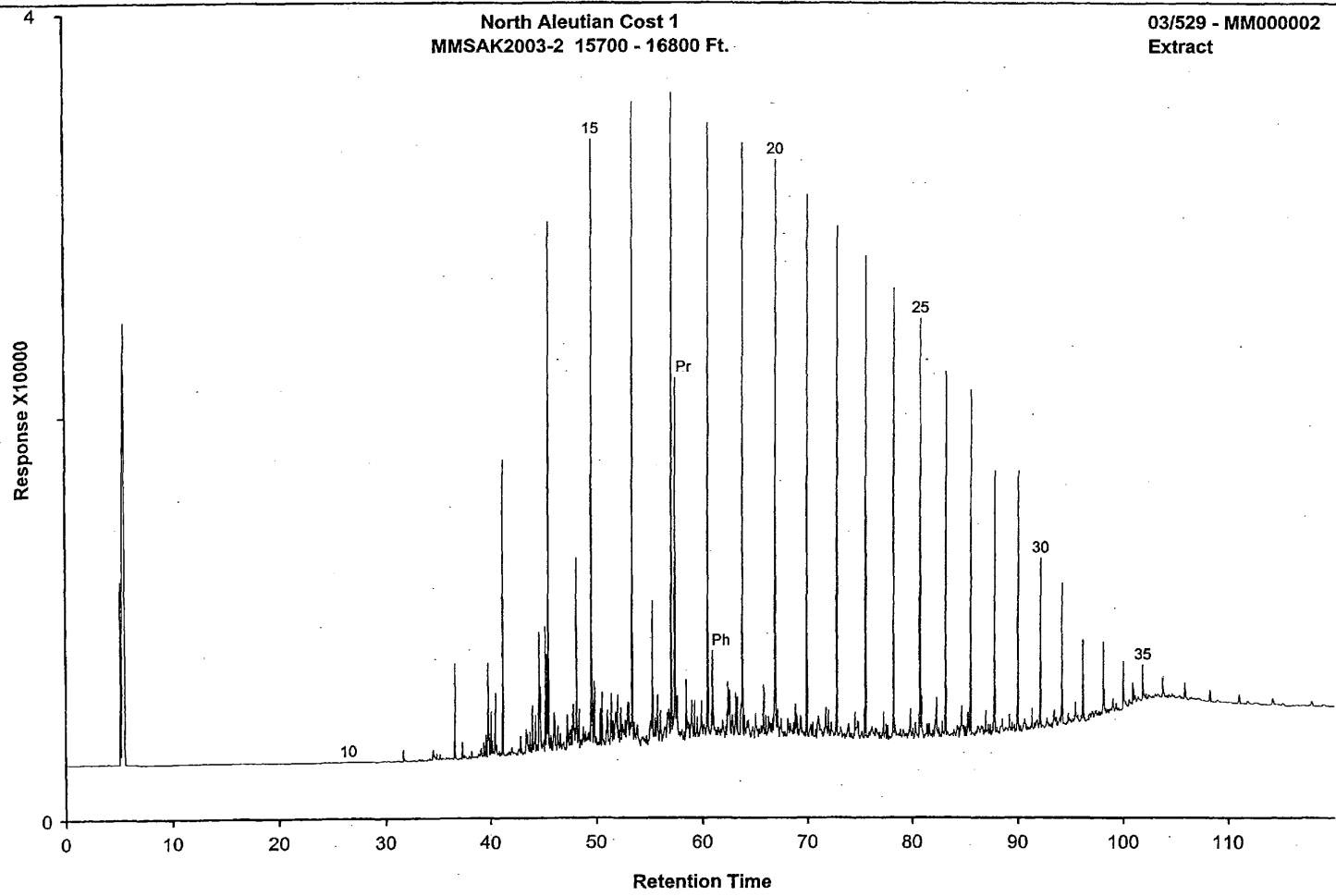
Company: MINERALS MANAGEMENT SERVICES
Well Name: NORTH ALEUTIAN COST 1
Depth: 15700 - 16800 FT
Sampling Point:

Client ID: MMSAK2003-2
Project #: 03-529-A
Lab ID: MM000002
File Name: G2030481.D

Peak Label	Compound Name	Ret. Time	Area	Height	Area%	Hght%
NC9	Normal Alkane C9					
NC10	Normal Alkane C10	26.484	229	32	0.01	0.00
IP11	Isoprenoid C11	27.758	93	24	0.00	0.00
NC11	Normal Alkane C11	31.697	2011	610	0.06	0.07
NC12	Normal Alkane C12	36.585	14379	4891	0.42	0.58
IP13	Isoprenoid C13	37.324	2904	897	0.09	0.11
IP14	Isoprenoid C14	40.064	7435	2332	0.22	0.28
NC13	Normal Alkane C13	41.174	44149	14784	1.29	1.75
IP15	Isoprenoid C15	44.609	24051	6100	0.70	0.72
NC14	Normal Alkane C14	45.490	82838	26476	2.43	3.13
IP16	Isoprenoid C16	48.130	42050	9649	1.23	1.14
NC15	Normal Alkane C15	49.556	106807	30443	3.13	3.60
NC16	Normal Alkane C16	53.399	110377	32204	3.23	3.80
IP18	Isoprenoid C18	55.302	34626	7260	1.01	0.86
NC17	Normal Alkane C17	57.036	109244	32344	3.20	3.82
IP19	Isoprenoid C19 (Pristane)	57.395	90946	18206	2.67	2.15
NC18	Normal Alkane C18	60.496	104231	30821	3.05	3.64
IP20	Isoprenoid C20 (Phytane)	60.932	24276	4510	0.71	0.53
NC19	Normal Alkane C19	63.790	101417	29756	2.97	3.52
NC20	Normal Alkane C20	66.928	103599	28945	3.04	3.42
NC21	Normal Alkane C21	69.932	94536	27236	2.77	3.22
NC22	Normal Alkane C22	72.804	90532	25619	2.65	3.03
NC23	Normal Alkane C23	75.552	89279	24079	2.62	2.84
NC24	Normal Alkane C24	78.198	80378	22499	2.36	2.66
NC25	Normal Alkane C25	80.737	76653	20956	2.25	2.48
NC26	Normal Alkane C26	83.180	66413	18244	1.95	2.16
NC27	Normal Alkane C27	85.536	63774	17344	1.87	2.05
NC28	Normal Alkane C28	87.803	49461	13250	1.45	1.57
NC29	Normal Alkane C29	90.003	49531	13101	1.45	1.55
NC30	Normal Alkane C30	92.122	31843	8652	0.93	1.02
NC31	Normal Alkane C31	94.180	28816	7245	0.84	0.86
NC32	Normal Alkane C32	96.165	16267	4135	0.48	0.49
NC33	Normal Alkane C33	98.103	17455	3779	0.51	0.45
NC34	Normal Alkane C34	99.979	10359	2486	0.30	0.29
NC35	Normal Alkane C35	101.799	8672	1877	0.25	0.22
NC36	Normal Alkane C36	103.704	4412	1022	0.13	0.12
NC37	Normal Alkane C37	105.822	4379	839	0.13	0.10
NC38	Normal Alkane C38	108.210	3708	610	0.11	0.07
NC39	Normal Alkane C39	110.970	3424	480	0.10	0.06
NC40	Normal Alkane C40	114.126	3271	353	0.10	0.04
NC41	Normal Alkane C41	117.840	2716	266	0.08	0.03

North Aleutian Cost 1
MMSAK2003-2 15700 - 16800 Ft.

03/529 - MM000002
Extract



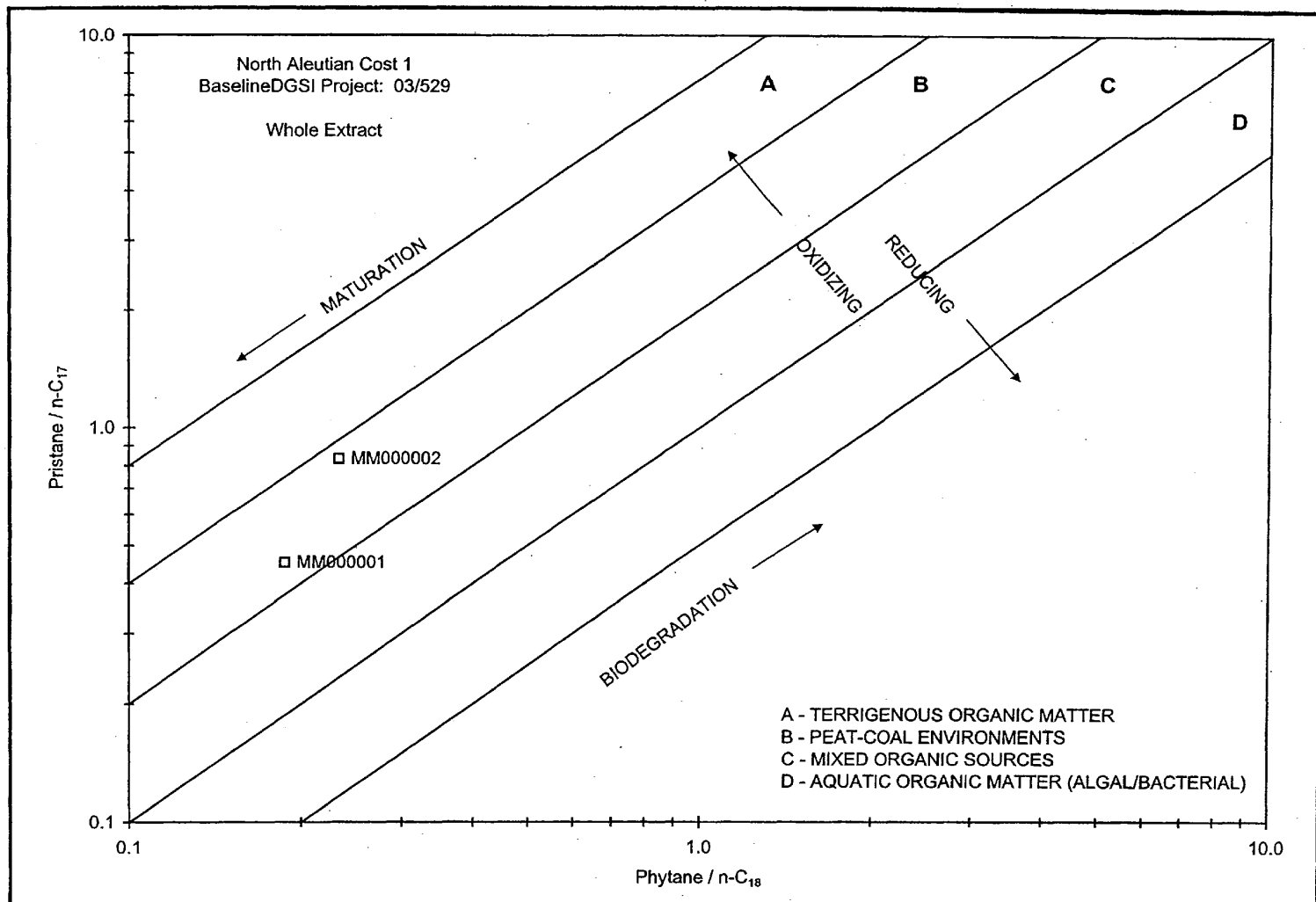


FIGURE 2 - Plot from chromatography data showing organic matter type, source rock depositional environment, and thermal maturity.

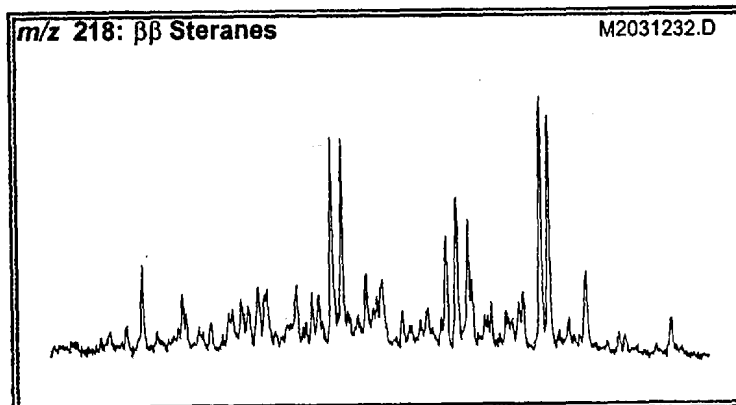
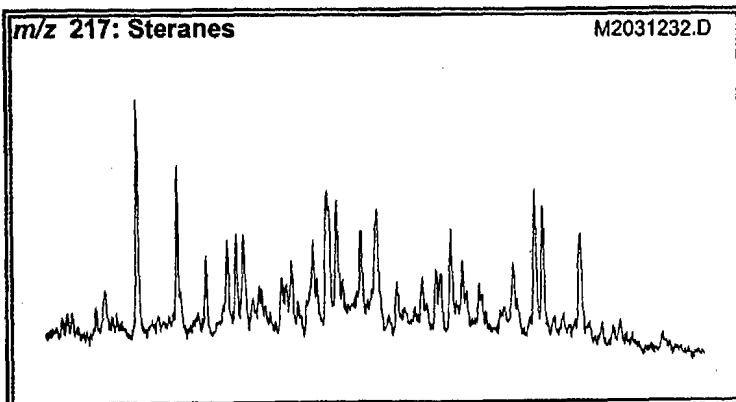
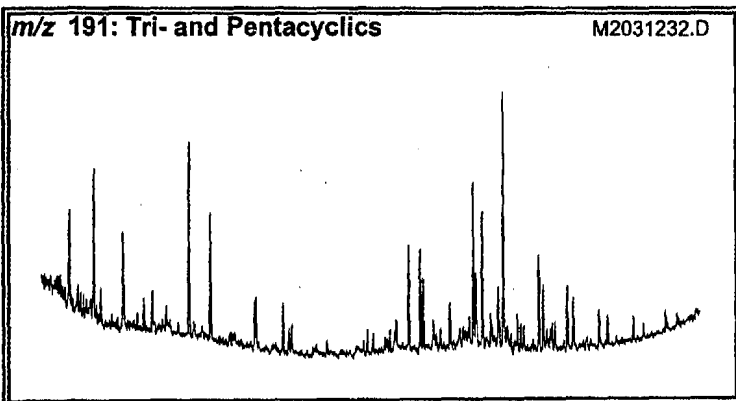


BASLINE DGSi
ANALYTICAL LABORATORIES

SATURATE GCMS

Company: MINERALS MANAGEMENT SERVICES
Country: UNITED STATES
Basin:
Lease:
Block:
Field:
Well Name: NORTH ALEUTIAN COST 1
Latitude:
Longitude:

Client ID: MMSAK2003-1
Project #: 03-529-A
Lab ID: MM000001
Sample Type: CORE
Sampling Point:
Formation:
Geologic Age:
Top Depth:
Bottom Depth:



RATIOS (on Areas) ¹		Appl ²	TEV ³
Steranes (m/z 217; 218)			
%C ₂₇ $\alpha\beta\beta$ S (218)	31.4	D	
%C ₂₈ $\alpha\beta\beta$ S (218)	29.1	D	
%C ₂₉ $\alpha\beta\beta$ S (218)	39.5	D	
%C ₂₇ $\alpha\alpha\alpha$ R (217)	33.9	D	
%C ₂₈ $\alpha\alpha\alpha$ R (217)	22.5	D	
%C ₂₉ $\alpha\alpha\alpha$ R (217)	43.6	D	
S/(S+R) (C ₂₉ $\alpha\alpha\alpha$) (217)	0.39	M	0.55 (0.8%)
$\beta\beta$ S/($\beta\beta$ S+ $\alpha\alpha$ R) (C ₂₉) (217)	0.50	M	0.70 (0.9%)
(C ₂₇ +C ₂₈)/(C ₂₇ +C ₂₈ +C ₂₉) (217)	0.19		
C ₂₇ /C ₂₈ ($\alpha\beta\beta$ S) (218)	0.80	D	
C ₂₈ /C ₂₉ ($\alpha\beta\beta$ S) (218)	0.74	D	
Diaster/ $\alpha\alpha\alpha$ Ster (C ₂₇) (217)	1.52	M/D	1.00 (1.4%)
C30 $\alpha\beta\beta$ S Sterane Index (218)	2.6	D	
C30 S+R Sterane Index (218)	2.7	D	
Terpanes (m/z 191)			
Oleanane/Hopane	0.29	D/A	
Gammacerane/Hopane	0.09	D	
Norhopane/Hopane	0.69	D	
Bisnorhopane/Hopane			
Diahopane/Hopane	0.53	M/D	
Moretane/Hopane	0.14	M	0.05 (0.7%)
25-nor-hopane/hopane	0.12	B	
Ts/(Ts+Tm) trisnorhopanes	0.59	M/D	1.00 (1.4%)
C29Ts/C29 Hopane	0.47	M	
H32 S/(R+S) Homohopanes	0.54	M	0.60 (0.6%)
H35/H34 Homohopanes	0.83	D	
C24 Tetracyclic/Hopane	0.20	D	
C24 Tetracyclic/C26 Tricyclics	0.78	D	
C23/C24 Tricyclic terpanes	1.67	D	
C19/C23 Tricyclic terpanes	0.43	D	
C26/C25 Tricyclic terpanes	0.73	D	
(C28+C29 Tricyclics)/Ts	0.97	A	
Various (m/z 191; 217)			
Steranes/Hopanes	0.69	D	
Tricyclic terpanes/Hopanes	0.80	M	1.00 (1.4%)
Tricyclic terpanes/Steranes	1.17	M/D	1.00 (1.4%)

¹Definition and utility of the ratios can be found on our website www.BaselineDGSi.com

²A=Source Age; D=Depositional environment; M= Maturity; B=Possible Biodegradation

³Thermal equilibrium value of the biomarker ratio and in brackets the approximate VR value at which this value is reached

Company: MINERALS MANAGEMENT SERVICES
Well Name: NORTH ALEUTIAN COST 1
Depth: -
Sampling Point:

Client ID: MMSAK2003-1
Project #: 03-529-A
Lab ID: MM000001
File Name: M2031232.D

Ion	Peak Label	Compound Name	Ret. Time	Area	Height	ppm (Area)	ppm (Hght)
217	CHOL	5 β cholane (internal standard)	42.282	16530	2594	100.0	100.0
123	LABD	labdane					
123	RIMU	rimuane					
123	PIM	pimarane					
123	ENTBEY	ent-beyerane					
123	ISOPIM	isopimarane					
123	B_PHYLLO	β -phylocladane					
123	B_KAUR	β -kaurane					
123	A_PHYLLO	α -phylocladane					
125	BCAROT	β -carotane					
187	4MDIAM	4-methyldiamantane	9.415	4829	1347	29.2	51.9
187	1MDIAM	1-methyldiamantane	10.025	4381	943	26.5	36.4
187	3MDIAM	3-methyldiamantane	10.409	4346	1005	26.3	38.7
188	DIAM	diamantane	9.259	3931	1165	23.8	44.9
191	TR19	C19 tricyclic terpene	19.017	3017	501	18.3	19.3
191	TR20	C20 tricyclic terpene	21.858	4820	775	29.2	29.9
191	TR21	C21 tricyclic terpene	25.169	4764	500	28.8	19.3
191	TR22	C22 tricyclic terpene	28.550	1656	214	10.0	8.3
191	TR23	C23 tricyclic terpene	32.780	7031	1016	42.5	39.2
191	TR24	C24 tricyclic terpene	35.204	4199	655	25.4	25.3
191	DESAOL	des-A-oleanane	37.714	370	62	2.2	2.4
191	DESALU	des-A-lupane					
191	TR25A	C25 tricyclic terpene (a)	40.242	1675	256	10.1	9.9
191	TR25B	C25 tricyclic terpene (b)	40.382	1551	265	9.4	10.2
191	DESEHOP	des-E-hopane	43.485	1846	270	11.2	10.4
191	TR26A	C26 tricyclic terpene (a)	44.113	1154	132	7.0	5.1
191	TR26B	C26 tricyclic terpene (b)	44.479	1213	157	7.3	6.1
191	TR28A	C28 tricyclic terpene (a)	53.005	796	127	4.8	4.9
191	TR28B	C28 tricyclic terpene (b)	53.632	887	109	5.4	4.2
191	TR29A	C29 tricyclic terpene (a)	55.550	669	114	4.0	4.4
191	TR29B	C29 tricyclic terpene (b)	56.282	1014	151	6.1	5.8
191	TR30A	C30 tricyclic terpene (a)	60.484	1053	151	6.4	5.8
191	TR30B	C30 tricyclic terpene (b)	61.286	637	111	3.9	4.3
191	TS	Ts 18 α (H)-trisnorhopane	57.712	3463	549	21.0	21.2
191	TM	Tm 17 α (H)-trisnorhopane	59.334	2455	372	14.9	14.3
191	H28	C28 17 α 18 α 21 β (H)-bisnorhopane					
191	NOR25H	C29 Nor-25-hopane	63.919	1090	113	6.6	4.4
191	H29	C29 Tm 17 α (H)21 β (H)-norhopane	65.105	6373	861	38.6	33.2
191	C29TS	C29 Ts 18 α (H)-nomeohopane	65.384	2993	394	18.1	15.2
191	DH30	C30 17 α (H)-diahopane	66.133	4963	708	30.0	27.3
191	M29	C29 normoretane	67.110	1017	176	6.2	6.8
191	OL	oleanane	67.964	2728	312	16.5	12.0
191	H30	C30 17 α (H)-hopane	68.557	9294	1337	56.2	51.5
191	M30	C30 moretane	70.126	1290	184	7.8	7.1

Company: MINERALS MANAGEMENT SERVICES
Well Name: NORTH ALEUTIAN COST 1
Depth: -
Sampling Point:

Client ID: MMSAK2003-1
Project #: 03-529-A
Lab ID: MM000001
File Name: M2031232.D

Ion	Peak Label	Compound Name	Ret. Time	Area	Height	ppm (Area)	ppm (Hght)
191	H31S	C31 22S 17 α (H) hopane	72.619	3419	500	20.7	19.3
191	H31R	C31 22R 17 α (H) hopane	73.107	2631	343	15.9	13.2
191	GAM	gammacerane	73.561	861	107	5.2	4.1
191	H32S	C32 22S 17 α (H) hopane	75.845	2133	328	12.9	12.6
191	H32R	C32 22R 17 α (H) hopane	76.524	1788	265	10.8	10.2
191	H33S	C33 22S 17 α (H) hopane	79.541	1449	203	8.8	7.8
191	H33R	C33 22R 17 α (H) hopane	80.482	1104	160	6.7	6.2
191	H34S	C34 22S 17 α (H) hopane	83.394	909	140	5.5	5.4
191	H34R	C34 22R 17 α (H) hopane	84.527	641	92	3.9	3.5
191	H35S	C35 22S 17 α (H) hopane	87.108	740	115	4.5	4.4
191	H35R	C35 22R 17 α (H) hopane	88.433	545	73	3.3	2.8
205	H31_2ME	C31- 2 α -methylhopane	68.923	422	61	2.6	2.4
205	H31S_205	C31 22S 17 α (H) hopane	72.619	1204	175	7.3	6.7
205	H31R_205	C31 22R 17 α (H) hopane	73.107	842	115	5.1	4.4
205	H31_3ME	C31 3 β -methylhopane	73.874	114	27	0.7	1.0
217	S21	C21 sterane	29.108	4222	501	25.5	19.3
217	S22	C22 sterane	33.826	1742	243	10.5	9.4
217	DIA27S	C27 $\beta\alpha$ 20S diasterane	48.454	2646	388	16.0	15.0
217	DIA27R	C27 $\beta\alpha$ 20R diasterane	50.023	1640	272	9.9	10.5
217	DIA28SA	C28 $\beta\alpha$ 20S diasterane a	52.255	1161	161	7.0	6.2
217	DIA28SB	C28 $\beta\alpha$ 20S diasterane b	52.517	1608	161	9.7	6.2
217	DIA28RA	C28 $\beta\alpha$ 20R diasterane a	53.964	853	92	5.2	3.5
217	DIA28RB	C28 $\beta\alpha$ 20R diasterane b	54.155	564	82	3.4	3.2
217	C27S	C27 $\alpha\alpha$ 20S sterane	55.167	1304	157	7.9	6.1
217	BB_D29S	C27 $\beta\beta$ 20R + C29 dia20S	55.690	3098	236	18.7	9.1
217	C27BBS	C27 $\beta\beta$ 20S sterane	56.056	1985	221	12.0	8.5
217	C27R	C27 $\alpha\alpha$ 20R sterane	56.945	1512	173	9.1	6.7
217	DIA29R	C29 $\beta\alpha$ 20R diasterane	57.573	2658	210	16.1	8.1
217	C28S	C28 $\alpha\alpha$ 20S sterane	59.281	869	101	5.3	3.9
217	C28BBR	C28 $\beta\beta$ 20R sterane(+5 $\beta\alpha\alpha$)	59.961	985	107	6.0	4.1
217	C28BBS	C28 $\beta\beta$ 20S sterane	60.380	1605	180	9.7	6.9
217	C28R	C28 $\alpha\alpha$ 20R sterane	61.443	1006	93	6.1	3.6
217	C29S	C29 $\alpha\alpha$ 20S sterane	62.751	1251	129	7.6	5.0
217	C29BBR	C29 $\beta\beta$ 20R sterane(+5 $\beta\alpha\alpha$)	63.570	2326	249	14.1	9.6
217	C29BBS	C29 $\beta\beta$ 20S sterane	63.867	1914	223	11.6	8.6
217	C29R	C29 $\alpha\alpha$ 20R sterane	65.314	1948	180	11.8	6.9
218	C27ABBR	C27 $\beta\beta$ 20R sterane	55.655	2363	285	14.3	11.0
218	C27ABBS	C27 $\beta\beta$ 20S sterane	56.056	2023	283	12.2	10.9
218	C28ABBR	C28 $\beta\beta$ 20R sterane	59.979	1344	152	8.1	5.9
218	C28ABBS	C28 $\beta\beta$ 20S sterane	60.380	1875	205	11.3	7.9
218	C29ABBR	C29 $\beta\beta$ 20R sterane	63.570	2697	343	16.3	13.2
218	C29ABBS	C29 $\beta\beta$ 20S sterane	63.884	2544	317	15.4	12.2
218	C30ABBR	C30 $\beta\beta$ 20R sterane	66.587	194	28	1.2	1.1
218	C30ABBS	C30 $\beta\beta$ 20S sterane	66.796	169	24	1.0	0.9

Company: MINERALS MANAGEMENT SERVICES
Well Name: NORTH ALEUTIAN COST 1
Depth: -
Sampling Point:

Client ID: MMSAK2003-1
Project #: 03-529-A
Lab ID: MM000001
File Name: M2031232.D

Ion	Peak Label	Compound Name	Ret. Time	Area	Height	ppm (Area)	ppm (Hght)
259	D27S	C27 $\beta\alpha$ 20S diasterane	48.454	1577	227	9.5	8.8
259	D27R	C27 $\beta\alpha$ 20R diasterane	50.023	989	157	6.0	6.1
259	D28SA	C28 $\beta\alpha$ 20S diasterane a	52.255	711	104	4.3	4.0
259	D28SB	C28 $\beta\alpha$ 20S diasterane b	52.551	824	95	5.0	3.7
259	D28RA	C28 $\beta\alpha$ 20R diasterane a	53.964	593	72	3.6	2.8
259	D28RB	C28 $\beta\alpha$ 20R diasterane b	54.155	445	55	2.7	2.1
259	D29S	C29 $\beta\alpha$ 20S diasterane	55.794	1506	128	9.1	4.9
259	D29R	C29 $\beta\alpha$ 20R diasterane	57.573	1152	94	7.0	3.6
259	C30TP1	C30 tetracyclic polyprenoid	67.075	244	34	1.5	1.3
259	C30TP2	C30 tetracyclic polyprenoid	67.232	205	30	1.2	1.2

Company: MINERALS MANAGEMENT SERVICES
 Well Name: NORTH ALEUTIAN COST 1
 Depth: -
 Sampling Point:

Client ID: MMSAK2003-1
 Project #: 03-529-A
 Lab ID: MM000001
 File Name: M2031232.D

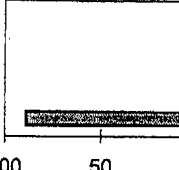
Miscellaneous Ratios	By Areas	By Heights
Steroids		
%C27 $\alpha\beta\beta$ S (218)	31.4	35.2
%C28 $\alpha\beta\beta$ S (218)	29.1	25.5
%C29 $\alpha\beta\beta$ S (218)	39.5	39.4
C30 $\alpha\beta\beta$ S Sterane Index (218)	2.6	2.9
C30 S+R Sterane Index (218)	2.7	3.2
C ₂₇ /C ₂₉ ($\alpha\beta\beta$ S) (218)	0.80	0.89
C ₂₈ /C ₂₉ ($\alpha\beta\beta$ S) (218)	0.74	0.65
C ₂₉ /C ₂₇ ($\alpha\beta\beta$ S) (218)	1.26	1.12
%C27 $\alpha\alpha\alpha$ R (217)	33.9	38.8
%C28 $\alpha\alpha\alpha$ R (217)	22.5	20.9
%C29 $\alpha\alpha\alpha$ R (217)	43.6	40.4
S/R (C ₂₉ $\alpha\alpha\alpha$) (217)	0.64	0.72
S/(S+R) (C ₂₉ $\alpha\alpha\alpha$) (217)	0.39	0.42
$\beta\beta/(\alpha\alpha+\beta\beta)$ (C ₂₉) (217)	0.57	0.60
$\alpha\beta\beta$ S/ $\alpha\alpha\alpha$ R (C ₂₉) (217)	0.98	1.24
(C ₂₁ +C ₂₂)/(C ₂₇ +C ₂₈ +C ₂₉) (217)	0.19	0.22
Diaster/ $\alpha\alpha\alpha$ Ster (C ₂₇) (217)	1.52	2.00
Terpenoids		
C19/C23 Tricyclic terpanes	0.43	0.49
C23/C24 Tricyclic terpanes	1.67	1.55
C26/C25 Tricyclic terpanes	0.73	0.55
C24 Tetracyclic/C26 Tricyclics	0.78	0.93
C24 Tetracyclic/Hopane	0.20	0.20
Ts/Tm trisnorhopanes	1.41	1.48
Ts/(Ts+Tm) trisnorhopanes	0.59	0.60
C29Ts/C29 Hopane	0.47	0.46
Bisnorhopane/Hopane	0.69	0.64
Norhopane/Hopane	0.53	0.53
Diahopane/Hopane	0.29	0.23
Oleanane/Hopane	0.09	0.08
Gammacerane/Hopane	0.12	0.12
Moretane/(Moretane+Hopane)	0.54	0.55
H32 S/(S+R) Homohopanes	0.83	0.81
H35/H34 Homohopanes		
[Steranes]/[Hopanes]	0.69	0.53
[Tricyclic terpanes]/[Hopanes]	0.80	0.81
[Tricyclic terpanes]/[Steranes]	1.17	1.53

EXTRACT SUMMARY SHEET

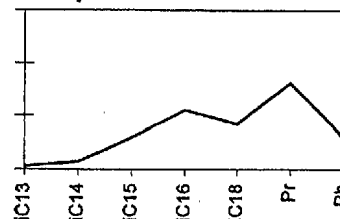
North Aleutian Cost 1
Other ID: MMSAK2003-1

BaselineDGSi Project: 03/529
Sample No. MM000001

BULK PROPERTIES

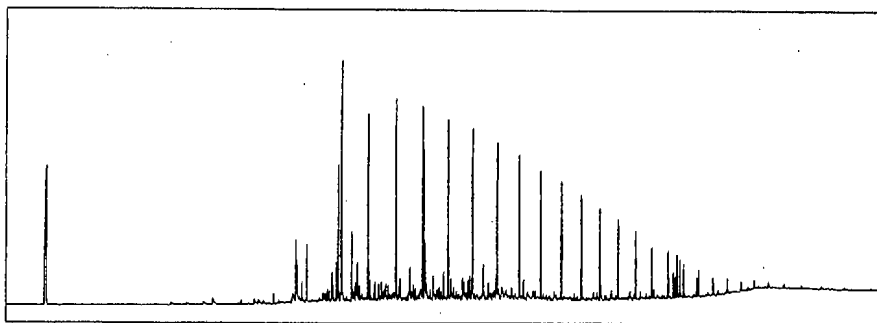
API Gravity	N.A.		%C15 + Comp.	$\delta^{13}\text{C}$
% S	N.A.		Sat	6.82 -28.50
ppm V	N.A.		Arom	1.16 -27.30
ppm Ni	N.A.		NSO	3.32
			Asph	88.69
			Sat/Arom	5.85

Isoprenoid Distribution

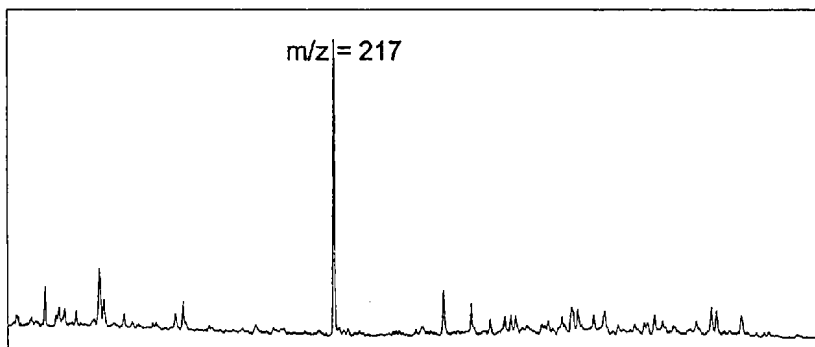
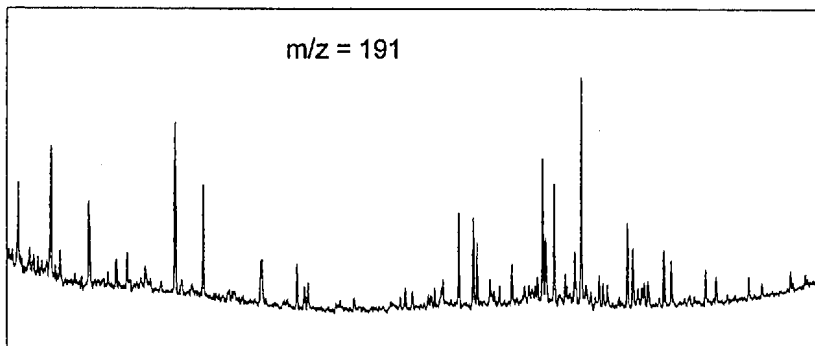


GAS CHROMATOGRAPHY

Pr/Ph	2.65
OEP	1.10
Pr/nC17	0.45
Ph/nC18	0.19



SATURATE BIOMARKERS



Terpane Ratios

C ₂₄ Tetracyclic/C ₂₆ Tricyclics	0.00
C ₁₉ + C ₂₀ Tricyclics/C ₂₃ Tricyclic	1.11
Ts/Tm	1.41
C ₂₈ Hopane/C ₃₀ Hopane	0.00
C ₂₉ Norhopane/C ₃₀ Hopane	0.69
C ₃₀ Oleanane/C ₃₀ Hopane	0.29
Gammacerane/C ₃₀ Hopane	0.09
Tricyclics (%)	41.05
C ₃₅ /C ₃₄ Extended Hopanes	0.83
C ₂₅ Tricyclics/C ₂₆ Tricyclics	1.36

Sterane Ratios

Diasteranes (%)	34.36
20S C ₂₉ Steranes (%)	39.11
$\alpha\beta\beta$ C ₂₉ Steranes (%)	57.00
Hopanes/Steranes	1.31
C ₂₁ Sterane (%)	11.44
C ₂₂ Sterane (%)	4.72
C ₂₇ Sterane (%)	28.83
C ₂₈ Sterane (%)	23.45
C ₂₉ Sterane (%)	31.56
C ₃₀ Sterane (%)	0.00

GAS CHROMATOGRAPHY - MASS SPECTROMETRY

Preliminary Interpretive Guidelines of Saturate Biomarker Ratios

North Aleutian Cost 1
Other ID: MMSAK2003-1

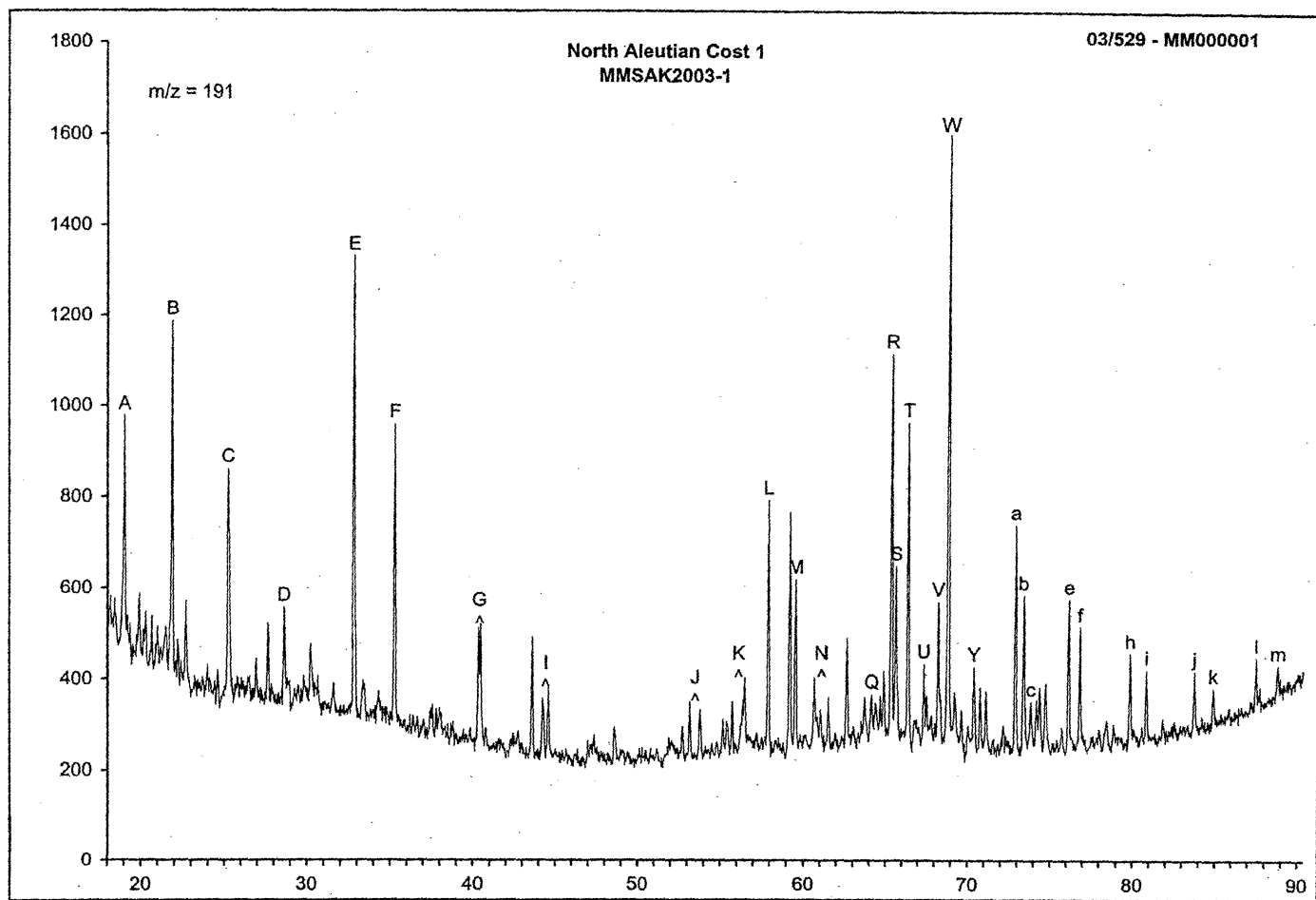
Baseline DGSi Project: 03/529
Sample No. MM000001

ORGANIC FACIES AND DEPOSITIONAL ENVIRONMENT

<u>Ratio</u>	<u>Value</u>	<u>Interpretation</u>
C ₁₉ + C ₂₀ Tricyclics / C ₂₃ Tricyclic	1.11	Not diagnostic
C ₂₄ Tetracyclic / C ₂₆ Tricyclics	0.00	Not diagnostic
C ₂₅ Tricyclics / C ₂₆ Tricyclics	1.36	Not diagnostic
C ₂₈ Bisanthracene / C ₃₀ Hopane	0.00	Not diagnostic
C ₂₉ Norhopane / C ₃₀ Hopane	0.69	Not diagnostic
C ₃₀ Diahopane / C ₃₀ Hopane	0.53	Siliciclastic and/or terrigenous
C ₃₀ Oleanane / C ₃₀ Hopane	0.29	Terrigenous angiosperm input
Gammacerane / C ₃₀ Hopane	0.09	Not lacustrine or hypersaline
% C ₃₁ - C ₃₅ Extended Hopanes	31.8	Marine maturity-influenced
C ₃₅ /C ₃₄ Extended Hopanes	0.83	Not diagnostic
Hopane/Sterane	1.31	Marine
% C ₂₇ Steranes	28.8	Mixed source
% C ₂₉ Steranes	31.6	Not higher plant dominated
Diasteranes	34.4	Mixed Source
Isosteranes (abb)	28.1	Not diagnostic
Short-chain steranes	16.2	Carbonate or hypersaline
Pristane/phytane	2.6	Marine terrigenous influence

THERMAL MATURITY

Ts / Tm	1.41	Mature
% C30 Moretane	12.19	Facies-influenced
22S / (22S+22R) C31 Hopane (%)	56.5	Greater than 0.5% Ro equivalent
% 20S/(20S + 20R)	39.1	Between 0.5 and 0.6% Ro equivalent
% abb/(abb + aaa)	57.0	Between 0.6% and 1.0% Ro equivalent
Odd Even Preference	1.10	Mature
Pristane/nC17	0.5	Paraffinic
Phytane/nC18	0.2	Paraffinic



TRITERPANE REPORT (m/z 191)

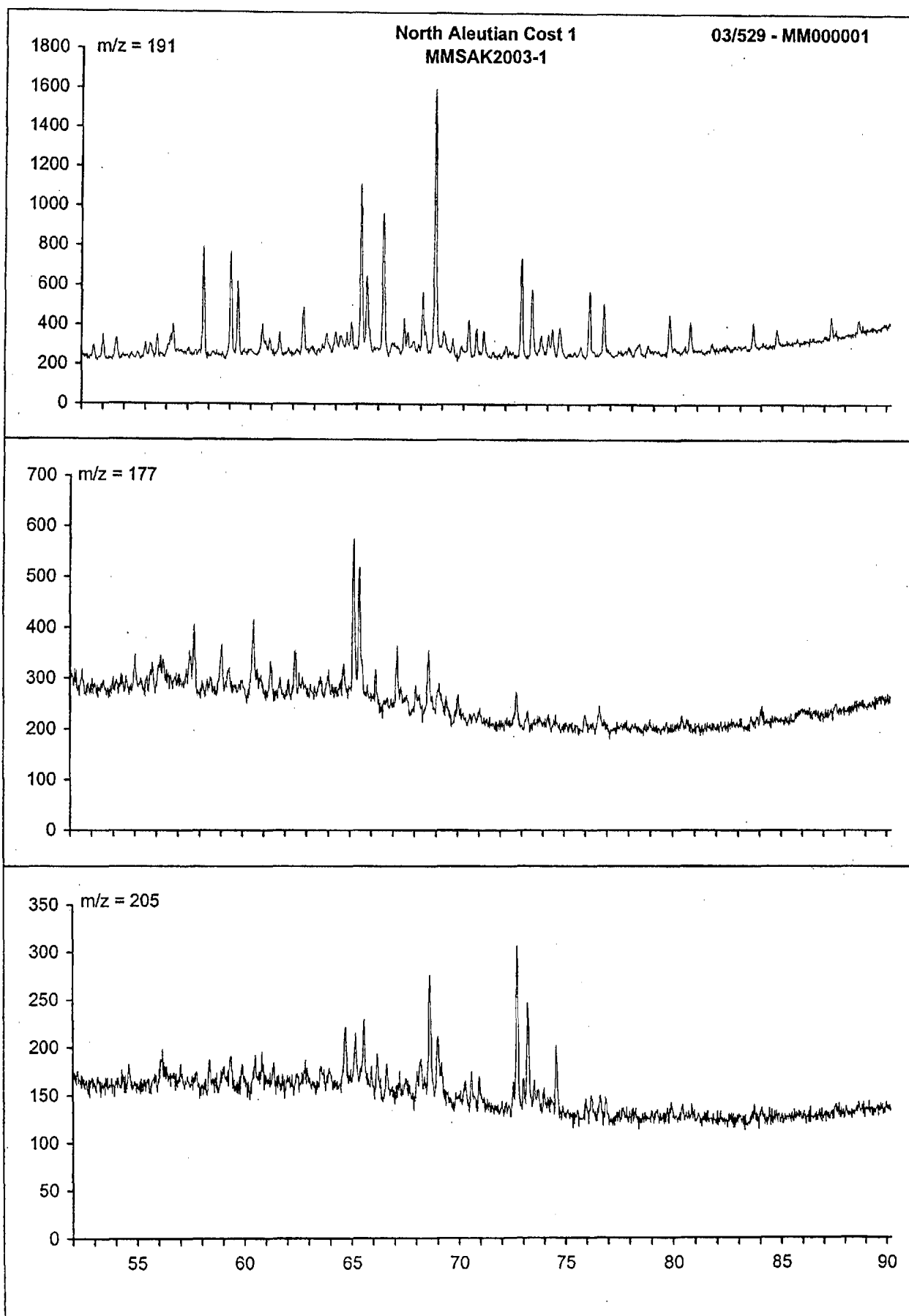
North Aleutian Cost 1

BaselineDGSi Project: 03/529

Sample No. MM000001

Other ID: MMSAK2003-1

No.	ID	Triterpane Name	Ret Time	Area	Area%	PPM
1	A	C ₁₉ Tricyclic Terpane	19.017	3017	3.43	18
2	B	C ₂₀ Tricyclic Terpane	21.858	4820	5.48	29
3	C	C ₂₁ Tricyclic Terpane	25.169	4764	5.41	29
4	D	C ₂₂ Tricyclic Terpane	28.550	1656	1.88	10
5	E	C ₂₃ Tricyclic Terpane	32.780	7031	7.99	43
6	F	C ₂₄ Tricyclic Terpane	35.204	4199	4.77	25
7	G	C ₂₅ Tricyclic Terpane (22R)	40.242	1675	1.90	10
8	G	C ₂₅ Tricyclic Terpane (22S)	40.382	1551	1.76	9
9	H	C ₂₄ Tetracyclic Terpane		0	0.00	<1
10	I	C ₂₆ Tricyclic Terpane (22R)	44.113	1154	1.31	7
11	I	C ₂₆ Tricyclic Terpane (22S)	44.479	1213	1.38	7
12	J	C ₂₈ Tricyclic Terpane (22R)	53.005	796	0.90	5
13	J	C ₂₈ Tricyclic Terpane (22S)	53.632	887	1.01	5
14	K	C ₂₉ Tricyclic Terpane (22R)	55.550	669	0.76	4
15	K	C ₂₉ Tricyclic Terpane (22S)	56.282	1014	1.15	6
16	L	C ₂₇ 18aH-Trisnorhopane (Ts)	57.712	3463	3.93	21
17	M	C ₂₇ 17aH-Trisnorhopane (Tm)	59.334	2455	2.79	15
18	N	C ₃₀ Tricyclic Terpane (22R)	60.484	1053	1.20	6
19	N	C ₃₀ Tricyclic Terpane (22S)	61.286	637	0.72	4
20	O	C ₂₈ 17aH,18aH,21bH-28,30-Bisnorhopane		0	0.00	<1
21	P	C ₃₁ Tricyclic Terpane (22R)		0	0.00	<1
22	Q	C ₂₉ 17aH,21bH 25-Norhopane	63.919	1090	1.24	7
23	P	C ₃₁ Tricyclic Terpane (22S)	65.105	0	0.00	<1
24	R	C ₂₉ 17aH,21bH-Norhopane	65.105	6373	7.24	39
25	S	C ₂₈ 18aH-Norneohopane (29Ts)	65.384	2993	3.40	18
26	T	C ₃₀ 17aH Diahopane	66.133	4963	5.64	30
27	U	C ₂₉ 17bH,21aH-Normoretane	67.110	1017	1.16	6
28	V	C ₃₀ 18aH+18bH-Oleanane	67.964	2728	3.10	17
29	W	C ₃₀ 17aH,21bH-Hopane	68.557	9294	10.56	56
30	X	C ₃₀ 30-Nor-29-homo-17aH-hopane		0	0.00	<1
31	Y	C ₃₀ 17bH,21aH-Moretane	70.126	1290	1.47	8
32	Z	C ₃₃ Tricyclic Terpane (22R)		0	0.00	<1
33	Z	C ₃₃ Tricyclic Terpane (22S)		0	0.00	<1
34	a	C ₃₁ 17aH,21bH-Homohopane (22S)	72.619	3419	3.88	21
35	b	C ₃₁ 17aH,21bH-Homohopane (22R)	73.107	2631	2.99	16
36	c	C ₃₀ Gammacerane	73.561	861	0.98	5
37	d	C ₃₄ Tricyclic Terpane (22R)		0	0.00	<1
38	d	C ₃₄ Tricyclic Terpane (22S)		0	0.00	<1
39	e	C ₃₂ 17aH,21bH-Bishomohopane (22S)	75.845	2133	2.42	13
40	f	C ₃₂ 17aH,21bH-Bishomohopane (22R)	76.524	1788	2.03	11
41	g	C ₃₅ Tricyclic Terpane (22R)		0	0.00	<1
42	g	C ₃₅ Tricyclic Terpane (22S)		0	0.00	<1
43	h	C ₃₃ 17aH,21bH-Trishomohopane (22S)	79.541	1449	1.65	9
44	i	C ₃₃ 17aH,21bH-Trishomohopane (22R)	80.482	1104	1.25	7
45	j	C ₃₄ 17aH,21bH-Tetrahomohopane (22S)	83.394	909	1.03	5
46	k	C ₃₄ 17aH,21bH-Tetrahomohopane (22R)	84.527	641	0.73	4
47	l	C ₃₅ 17aH,21bH-Pentahomohopane (22S)	87.108	740	0.84	4
48	m	C ₃₅ 17aH,21bH-Pentahomohopane (22R)	88.433	545	0.62	3



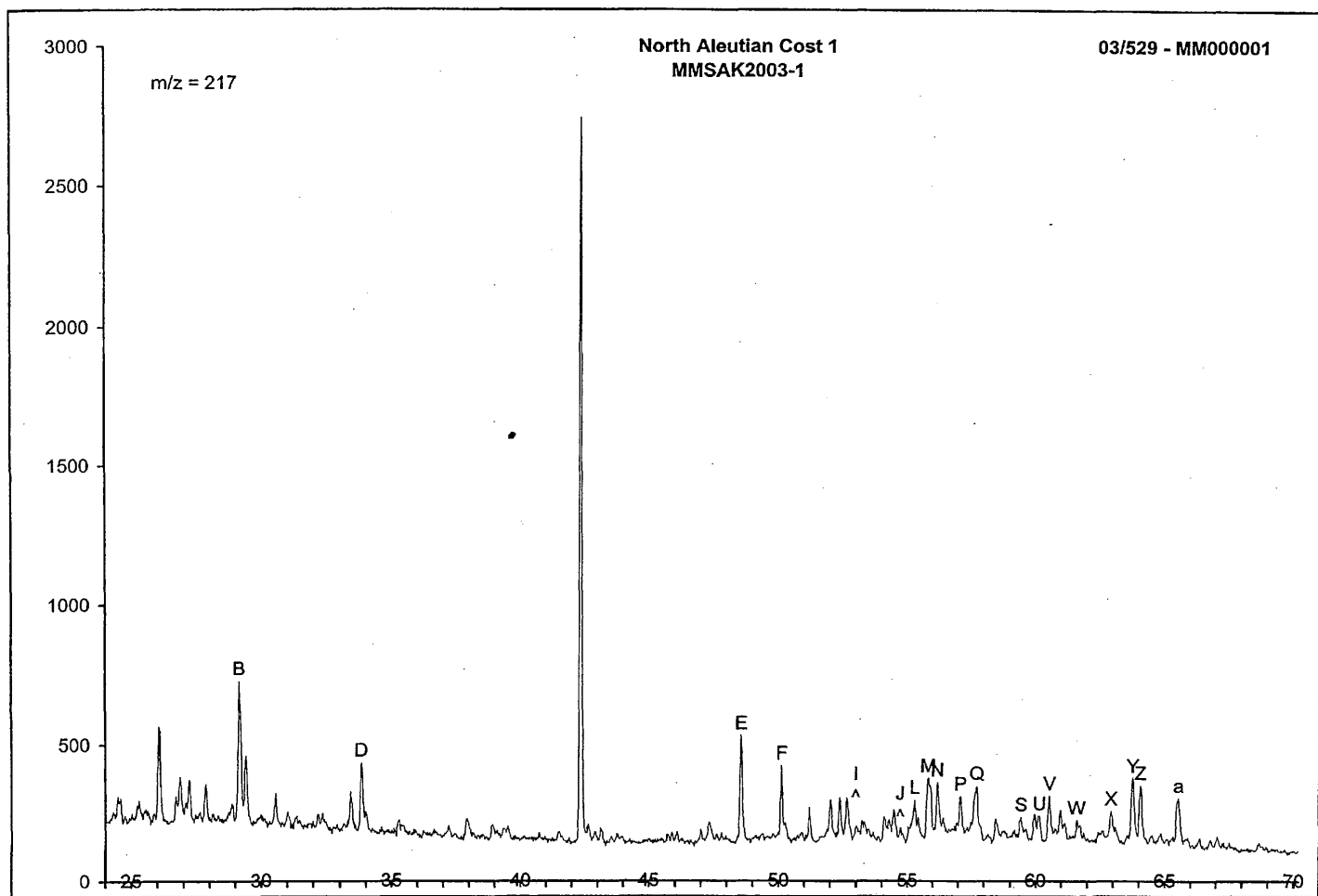
STERANE REPORT (m/z 217)

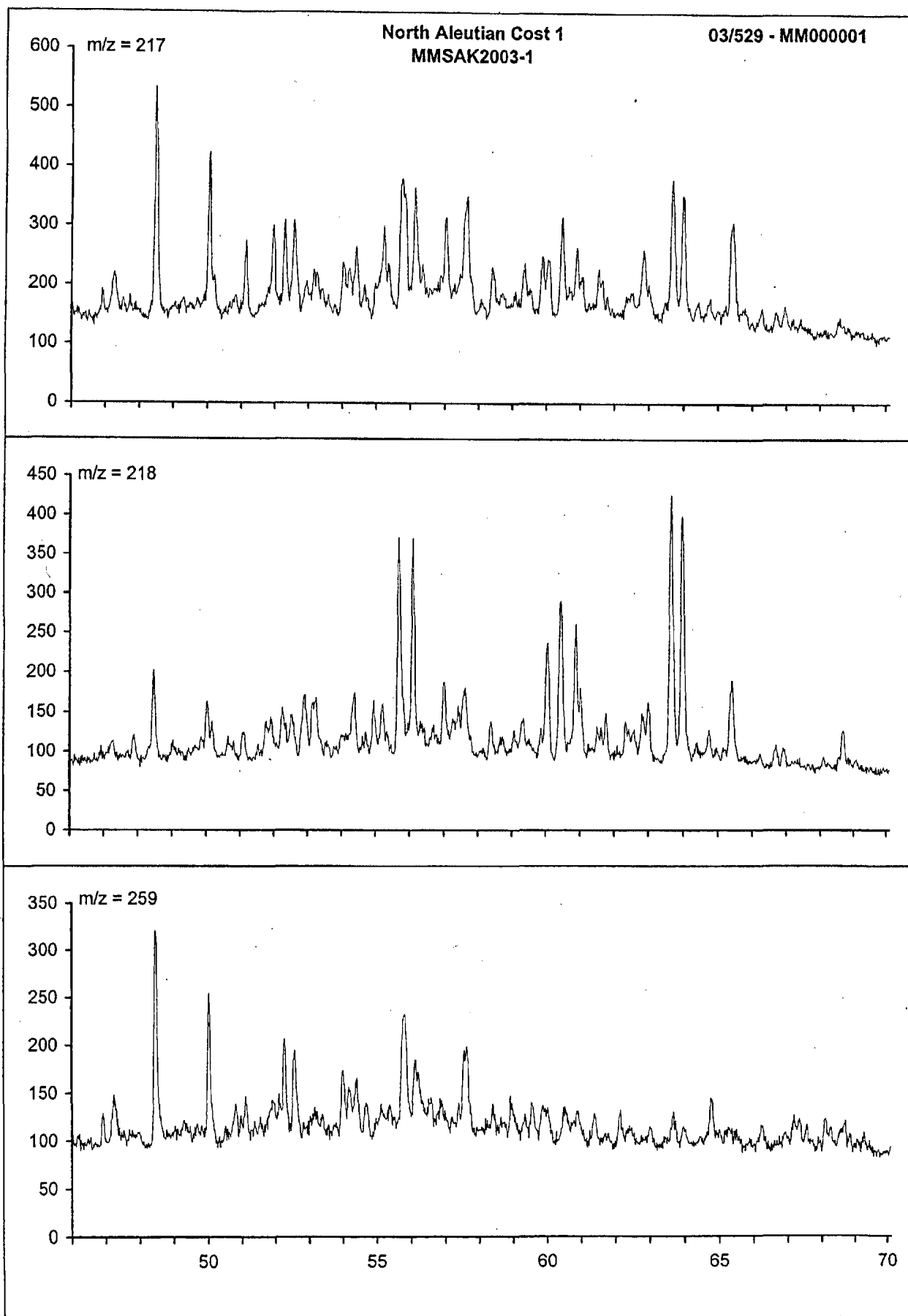
North Aleutian Cost 1

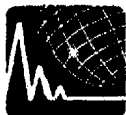
BaselineDGSi Project: 03/529

Sample No. MM000001

No.	ID	Sterane Name	Ret Time	Area	Area%	PPM
1	A	C ₂₁ diasterane		0	0.00	<1
2	B	C ₂₁ abb sterane	29.11	4222	11.44	26
3	C	C ₂₂ diasterane		0	0.00	<1
4	D	C ₂₂ abb sterane	33.83	1742	4.72	11
5	E	C ₂₇ ba diasterane (20S)	48.45	2646	7.17	16
6	F	C ₂₇ ba diasterane (20R)	50.02	1640	4.44	10
7	G	C ₂₇ ab diasterane (20S)		0	0.00	<1
8	H	C ₂₇ ab diasterane (20R)		0	0.00	<1
9	I	C ₂₈ ba diasterane (20S)	52.26	2769	7.50	17
10	J	C ₂₈ ba diasterane (20R)	53.96	1417	3.84	9
11	K	C ₂₈ ab diasterane (20S)		0	0.00	<1
12	L	C ₂₇ aaa sterane (20S)	55.17	1304	3.53	8
13	M	C ₂₇ abb ster-(20R)+C ₂₉ ba dia-(20S)	55.69	3098	8.40	19
14	N	C ₂₇ abb sterane (20S)	56.06	1985	5.38	12
15	O	C ₂₈ ab diasterane (20R)		0	0.00	<1
16	P	C ₂₇ aaa sterane (20R)	56.95	1512	4.10	9
17	Q	C ₂₉ ba diasterane (20R)	57.57	2658	7.20	16
18	R	C ₂₉ ab diasterane (20S)		0	0.00	<1
19	S	C ₂₈ aaa sterane (20S)	59.28	869	2.36	5
20	T	C ₂₉ ab diasterane (20R)		0	0.00	<1
21	U	C ₂₈ abb sterane (20R)	59.96	985	2.67	6
22	V	C ₂₈ abb sterane (20S)	60.38	1605	4.35	10
23	W	C ₂₈ aaa sterane (20R)	61.44	1006	2.73	6
24	X	C ₂₉ aaa sterane (20S)	62.75	1251	3.39	8
25	Y	C ₂₉ abb sterane (20R)	63.57	2326	6.30	14
26	Z	C ₂₉ abb sterane (20S)	63.87	1914	5.19	12
27	a	C ₂₉ aaa sterane (20R)	65.31	1948	5.28	12
28	b	C ₃₀ aaa sterane (20S)		0	0.00	<1
29	c	C ₃₀ abb sterane (20R)		0	0.00	<1
30	d	C ₃₀ abb sterane (20S)		0	0.00	<1
31	e	C ₃₀ aaa sterane (20R)		0	0.00	<1







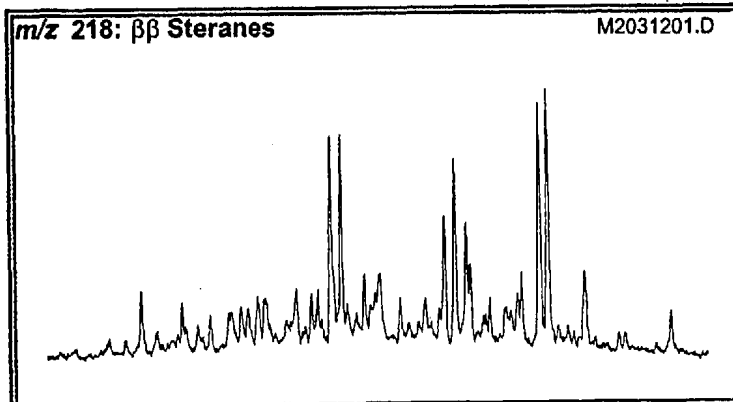
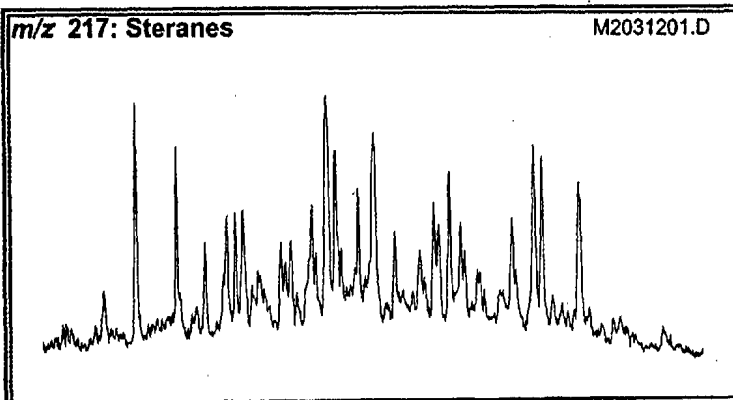
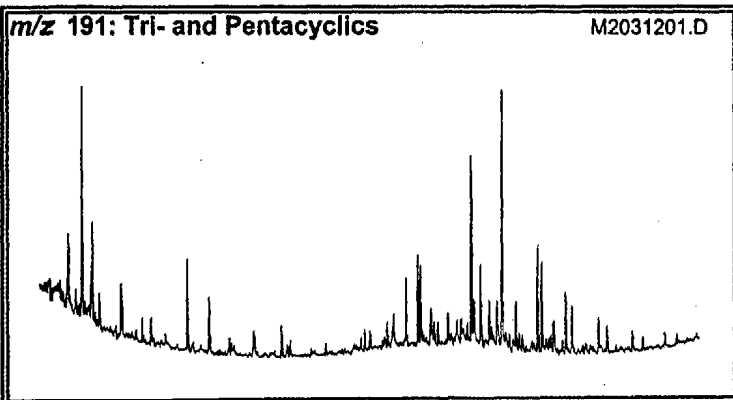
BASELINE DGSi

ANALYTICAL LABORATORIES

SATURATE GCMS

Company: MINERALS MANAGEMENT SERVICES
 Country: UNITED STATES
 Basin:
 Lease:
 Block:
 Field:
 Well Name: NORTH ALEUTIAN COST 1
 Latitude:
 Longitude:

Client ID: MMSAK2003-2
 Project #: 03-529-A
 Lab ID: MM000002
 Sample Type: CUTTINGS
 Sampling Point:
 Formation:
 Geologic Age:
 Top Depth: 15700 FT
 Bottom Depth: 16800 FT



RATIOS (on Areas) ¹		Appl ²	TEV ³
Steranes (m/z 217; 218)			
%C ₂₇ $\alpha\beta\beta$ S (218)	29.1	D	
%C ₂₈ $\alpha\beta\beta$ S (218)	30.6	D	
%C ₂₉ $\alpha\beta\beta$ S (218)	40.3	D	
%C ₂₇ $\alpha\alpha\alpha$ R (217)	29.9	D	
%C ₂₈ $\alpha\alpha\alpha$ R (217)	23.4	D	
%C ₂₉ $\alpha\alpha\alpha$ R (217)	46.7	D	
S/(S+R) (C ₂₉ $\alpha\alpha\alpha$) (217)	0.42	M	0.55 (0.8%)
$\beta\beta$ S/($\beta\beta$ S+ $\alpha\alpha$ R) (C ₂₉) (217)	0.48	M	0.70 (0.9%)
(C ₂₁ +C ₂₂)/(C ₂₇ +C ₂₈ +C ₂₉) (217)	0.09		
C ₂₇ /C ₂₉ ($\alpha\beta\beta$ S) (218)	0.72	D	
C ₂₈ /C ₂₉ ($\alpha\beta\beta$ S) (218)	0.76	D	
Diaster/ $\alpha\alpha\alpha$ Ster (C ₂₇) (217)	1.51	M/D	1.00 (1.4%)
C ₃₀ $\alpha\beta\beta$ S Sterane Index (218)	2.9	D	
C ₃₀ S+R Sterane Index (218)	2.9	D	
Terpanes (m/z 191)			
Oleanane/Hopane	0.22	D/A	
Gammacerane/Hopane	0.05	D	
Northopane/Hopane	0.74	D	
Bisnorhopane/Hopane			
Diahopane/Hopane	0.27	M/D	
Moretane/Hopane	0.17	M	0.05 (0.7%)
25-nor-hopane/hopane	0.12	B	
Ts/(Ts+Tm) trisnorhopanes	0.45	M/D	1.00 (1.4%)
C ₂₉ Ts/C ₂₉ Hopane	0.26	M	
H ₃₂ S/(R+S) Homohopanes	0.57	M	0.60 (0.6%)
H ₃₅ /H ₃₄ Homohopanes	0.61	D	
C ₂₄ Tetracyclic/Hopane	0.12	D	
C ₂₄ Tetracyclic/C ₂₆ Tricyclics	0.86	D	
C ₂₃ /C ₂₄ Tricyclic terpanes	1.73	D	
C ₁₉ /C ₂₃ Tricyclic terpanes	0.75	D	
C ₂₆ /C ₂₅ Tricyclic terpanes	0.77	D	
(C ₂₈ +C ₂₉ Tricyclics)/Ts	1.52	A	
Various (m/z 191; 217)			
Steranes/Hopanes	0.69	D	
Tricyclic terpanes/Hopanes	0.56	M	1.00 (1.4%)
Tricyclic terpanes/Steranes	0.81	M/D	1.00 (1.4%)

¹Definition and utility of the ratios can be found on our website www.BaselineDGSi.com

²A=Source Age; D=Depositional environment; M= Maturity; B=Possible Biodegradation

³Thermal equilibrium value of the biomarker ratio and in brackets the approximate VR value at which this value is reached

Company: MINERALS MANAGEMENT SERVICES
Well Name: NORTH ALEUTIAN COST 1
Depth: 15700 - 16800 FT
Sampling Point:

Client ID: MMSAK2003-2
Project #: 03-529-A
Lab ID: MM000002
File Name: M2031201.D

Ion	Peak Label	Compound Name	Ret. Time	Area	Height	ppm (Area)	ppm (Hght)
217	CHOL	5 β cholane (internal standard)	42.317	19106	2951	100.0	100.0
123	LABD	labdane					
123	RIMU	rimuane					
123	PIM	pimarane					
123	ENTBEY	ent-beyerane					
123	ISOPIM	isopimarane	20.654	24755	3992	129.6	135.3
123	B_PHYLLO	β -phyllodane					
123	B_KAUR	β -kaurane					
123	A_PHYLLO	α -phyllodane					
125	BCAROT	β -carotane					
187	4MDIAM	4-methyldiamantane	9.431	5405	1497	28.3	50.7
187	1MDIAM	1-methyldiamantane	10.024	5683	1141	29.7	38.7
187	3MDIAM	3-methyldiamantane	10.407	5001	1103	26.2	37.4
188	DIAM	diamantane	9.275	4429	1216	23.2	41.2
191	TR19	C19 tricyclic terpene	19.034	6015	975	31.5	33.0
191	TR20	C20 tricyclic terpene	21.874	7099	1282	37.2	43.4
191	TR21	C21 tricyclic terpene	25.203	7122	696	37.3	23.6
191	TR22	C22 tricyclic terpene	28.566	2407	346	12.6	11.7
191	TR23	C23 tricyclic terpene	32.797	8048	1184	42.1	40.1
191	TR24	C24 tricyclic terpene	35.238	4641	721	24.3	24.4
191	DESAOL	des-A-oleanane	37.749	1059	148	5.5	5.0
191	DESALU	des-A-lupane	38.063	674	120	3.5	4.1
191	TR25A	C25 tricyclic terpene (a)	40.295	2186	343	11.4	11.6
191	TR25B	C25 tricyclic terpene (b)	40.417	2148	355	11.2	12.0
191	DESEHOP	des-E-hopane	43.520	2874	419	15.0	14.2
191	TR26A	C26 tricyclic terpene (a)	44.165	1631	172	8.5	5.8
191	TR26B	C26 tricyclic terpene (b)	44.514	1702	228	8.9	7.7
191	TR28A	C28 tricyclic terpene (a)	53.039	1972	278	10.3	9.4
191	TR28B	C28 tricyclic terpene (b)	53.650	2162	256	11.3	8.7
191	TR29A	C29 tricyclic terpene (a)	55.602	1854	328	9.7	11.1
191	TR29B	C29 tricyclic terpene (b)	56.335	2810	415	14.7	14.1
191	TR30A	C30 tricyclic terpene (a)	60.537	3955	487	20.7	16.5
191	TR30B	C30 tricyclic terpene (b)	61.356	2020	305	10.6	10.3
191	TS	Ts 18 α (H)-trisnorhopane	57.764	5802	897	30.4	30.4
191	TM	Tm 17 α (H)-trisnorhopane	59.386	7204	1055	37.7	35.8
191	H28	C28 17 α 18 α 21 β (H)-bisnorhopane					
191	NOR25H	C29 Nor-25-hopane	63.971	2962	324	15.5	11.0
191	H29	C29 Tm 17 α (H)21 β (H)-norhopane	65.157	17463	2470	91.4	83.7
191	C29TS	C29 Ts 18 α (H)-nomeohopane	65.436	4596	584	24.1	19.8
191	DH30	C30 17 α (H)-diahopane	66.185	6489	1041	34.0	35.3
191	M29	C29 normoretane	67.162	3698	577	19.4	19.6
191	OL	oleanane	68.034	5242	581	27.4	19.7
191	H30	C30 17 α (H)-hopane	68.609	23750	3359	124.3	113.8
191	M30	C30 moretane	70.196	4081	620	21.4	21.0

Company: MINERALS MANAGEMENT SERVICES
Well Name: NORTH ALEUTIAN COST 1
Depth: 15700 - 16800 FT
Sampling Point:

Client ID: MMSAK2003-2
Project #: 03-529-A
Lab ID: MM000002
File Name: M2031201.D

Ion	Peak Label	Compound Name	Ret. Time	Area	Height	ppm (Area)	ppm (Hght)
191	H31S	C31 22S 17 α (H) hopane	72.671	9334	1400	48.9	47.4
191	H31R	C31 22R 17 α (H) hopane	73.177	8273	1173	43.3	39.7
191	GAM	gammacerane	73.613	1236	166	6.5	5.6
191	H32S	C32 22S 17 α (H) hopane	75.897	5228	802	27.4	27.2
191	H32R	C32 22R 17 α (H) hopane	76.577	3989	626	20.9	21.2
191	H33S	C33 22S 17 α (H) hopane	79.593	3043	463	15.9	15.7
191	H33R	C33 22R 17 α (H) hopane	80.552	2329	346	12.2	11.7
191	H34S	C34 22S 17 α (H) hopane	83.446	2093	281	11.0	9.5
191	H34R	C34 22R 17 α (H) hopane	84.579	1341	195	7.0	6.6
191	H35S	C35 22S 17 α (H) hopane	87.142	1295	198	6.8	6.7
191	H35R	C35 22R 17 α (H) hopane	88.467	802	136	4.2	4.6
205	H31_2ME	C31- 2 α -methylhopane	68.993	1415	198	7.4	6.7
205	H31S_205	C31 22S 17 α (H) hopane	72.671	3186	466	16.7	15.8
205	H31R_205	C31 22R 17 α (H) hopane	73.177	2525	357	13.2	12.1
205	H31_3ME	C31 3 β -methylhopane	73.927	365	48	1.9	1.6
217	S21	C21 sterane	29.124	5052	575	26.4	19.5
217	S22	C22 sterane	33.861	1651	217	8.6	7.4
217	DIA27S	C27 $\beta\alpha$ 20S diasterane	48.506	4657	689	24.4	23.3
217	DIA27R	C27 $\beta\alpha$ 20R diasterane	50.058	3373	542	17.7	18.4
217	DIA28SA	C28 $\beta\alpha$ 20S diasterane a	52.290	2229	331	11.7	11.2
217	DIA28SB	C28 $\beta\alpha$ 20S diasterane b	52.586	3305	339	17.3	11.5
217	DIA28RA	C28 $\beta\alpha$ 20R diasterane a	54.033	1638	242	8.6	8.2
217	DIA28RB	C28 $\beta\alpha$ 20R diasterane b	54.208	1238	187	6.5	6.3
217	C27S	C27 $\alpha\alpha$ 20S sterane	55.219	2365	356	12.4	12.1
217	BB_D29S	C27 $\beta\beta$ 20R + C29 dia20S	55.777	8460	677	44.3	22.9
217	C27BBS	C27 $\beta\beta$ 20S sterane	56.108	4792	517	25.1	17.5
217	C27R	C27 $\alpha\alpha$ 20R sterane	56.997	2951	407	15.4	13.8
217	DIA29R	C29 $\beta\alpha$ 20R diasterane	57.625	7475	573	39.1	19.4
217	C28S	C28 $\alpha\alpha$ 20S sterane	59.299	2295	229	12.0	7.8
217	C28BBR	C28 $\beta\beta$ 20R sterane(+5 $\beta\alpha\alpha$)	60.031	2565	307	13.4	10.4
217	C28BBS	C28 $\beta\beta$ 20S sterane	60.432	4212	464	22.0	15.7
217	C28R	C28 $\alpha\alpha$ 20R sterane	61.495	2317	177	12.1	6.0
217	C29S	C29 $\alpha\alpha$ 20S sterane	62.803	3306	331	17.3	11.2
217	C29BBR	C29 $\beta\beta$ 20R sterane(+5 $\beta\alpha\alpha$)	63.623	5296	549	27.7	18.6
217	C29BBS	C29 $\beta\beta$ 20S sterane	63.954	4258	517	22.3	17.5
217	C29R	C29 $\alpha\alpha$ 20R sterane	65.366	4617	443	24.2	15.0
218	C27ABBR	C27 $\beta\beta$ 20R sterane	55.707	5530	665	28.9	22.5
218	C27ABBS	C27 $\beta\beta$ 20S sterane	56.108	4443	668	23.3	22.6
218	C28ABBR	C28 $\beta\beta$ 20R sterane	60.048	3329	410	17.4	13.9
218	C28ABBS	C28 $\beta\beta$ 20S sterane	60.432	4682	594	24.5	20.1
218	C29ABBR	C29 $\beta\beta$ 20R sterane	63.605	6510	775	34.1	26.3
218	C29ABBS	C29 $\beta\beta$ 20S sterane	63.936	6156	819	32.2	27.8
218	C30ABBR	C30 $\beta\beta$ 20R sterane	66.621	472	64	2.5	2.2
218	C30ABBS	C30 $\beta\beta$ 20S sterane	66.848	455	63	2.4	2.1

Company:	MINERALS MANAGEMENT SERVICES	Client ID:	MMSAK2003-2
Well Name:	NORTH ALEUTIAN COST 1	Project #:	03-529-A
Depth:	15700 - 16800 FT	Lab ID:	MM000002
Sampling Point:		File Name:	M2031201.D

Ion	Peak Label	Compound Name	Ret. Time	Area	Height	ppm (Area)	ppm (Hght)
259	D27S	C27 $\beta\alpha$ 20S diasterane	48.524	3209	454	16.8	15.4
259	D27R	C27 $\beta\alpha$ 20R diasterane	50.058	2382	327	12.5	11.1
259	D28SA	C28 $\beta\alpha$ 20S diasterane a	52.307	1650	244	8.6	8.3
259	D28SB	C28 $\beta\alpha$ 20S diasterane b	52.569	2114	235	11.1	8.0
259	D28RA	C28 $\beta\alpha$ 20R diasterane a	54.016	1690	205	8.8	6.9
259	D28RB	C28 $\beta\alpha$ 20R diasterane b	54.208	1300	165	6.8	5.6
259	D29S	C29 $\beta\alpha$ 20S diasterane	55.829	5530	438	28.9	14.8
259	D29R	C29 $\beta\alpha$ 20R diasterane	57.625	4456	324	23.3	11.0
259	C30TP1	C30 tetracyclic polyprenoid	67.110	651	89	3.4	3.0
259	C30TP2	C30 tetracyclic polyprenoid	67.249	470	81	2.5	2.7

Company: MINERALS MANAGEMENT SERVICES
Well Name: NORTH ALEUTIAN COST 1
Depth: 15700 - 16800 FT
Sampling Point:

Client ID: MMSAK2003-2
Project #: 03-529-A
Lab ID: MM000002
File Name: M2031201.D

Miscellaneous Ratios	By Areas	By Heights
Steroids		
%C27 $\alpha\beta\beta$ S (218)	29.1	32.1
%C28 $\alpha\beta\beta$ S (218)	30.6	28.5
%C29 $\alpha\beta\beta$ S (218)	40.3	39.4
C30 $\alpha\beta\beta$ S Sterane Index (218)	2.9	2.9
C30 S+R Sterane Index (218)	2.9	3.1
C ₂₇ /C ₂₉ ($\alpha\beta\beta$ S) (218)	0.72	0.82
C ₂₈ /C ₂₉ ($\alpha\beta\beta$ S) (218)	0.76	0.73
C ₂₈ /C ₂₇ ($\alpha\beta\beta$ S) (218)	1.39	1.23
%C27 $\alpha\alpha\alpha$ R (217)	29.9	39.6
%C28 $\alpha\alpha\alpha$ R (217)	23.4	17.2
%C29 $\alpha\alpha\alpha$ R (217)	46.7	43.1
S/R (C ₂₉ $\alpha\alpha\alpha$) (217)	0.72	0.75
S/(S+R) (C ₂₉ $\alpha\alpha\alpha$) (217)	0.42	0.43
$\beta\beta/(\alpha\alpha+\beta\beta)$ (C ₂₉) (217)	0.55	0.58
$\alpha\beta\beta$ S/ $\alpha\alpha\alpha$ R (C ₂₉) (217)	0.92	1.17
(C ₂₁ +C ₂₂)/(C ₂₇ +C ₂₈ +C ₂₉) (217)	0.09	0.10
Diaster/ $\alpha\alpha\alpha$ Ster (C ₂₇) (217)	1.51	1.61
Terpenoids		
C19/C23 Tricyclic terpanes	0.75	0.82
C23/C24 Tricyclic terpanes	1.73	1.64
C26/C25 Tricyclic terpanes	0.77	0.57
C24 Tetracyclic/C26 Tricyclics	0.86	1.05
C24 Tetracyclic/Hopane	0.12	0.12
Ts/Tm trisnorhopanes	0.81	0.85
Ts/(Ts+Tm) trisnorhopanes	0.45	0.46
C29Ts/C29 Hopane	0.26	0.24
Bisnorhopane/Hopane		
Norhopane/Hopane	0.74	0.74
Diahopane/Hopane	0.27	0.31
Oleanane/Hopane	0.22	0.17
Gammacerane/Hopane	0.05	0.05
Moretane/(Moretane+Hopane)	0.15	0.16
H32 S/(S+R) Homohopanes	0.57	0.56
H35/H34 Homohopanes	0.61	0.70
[Steranes]/[Hopanes]	0.69	0.52
[Tricyclic terpanes]/[Hopanes]	0.56	0.56
[Tricyclic terpanes]/[Steranes]	0.81	1.06

EXTRACT SUMMARY SHEET

North Aleutian Cost 1

Other ID: MMSAK2003-2 15700 - 16800 Ft.

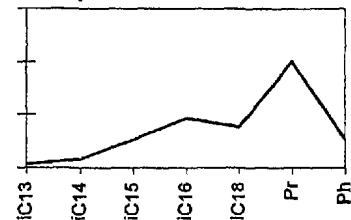
BaselineDGSi Project: 03/529

Sample No. MM000002

BULK PROPERTIES

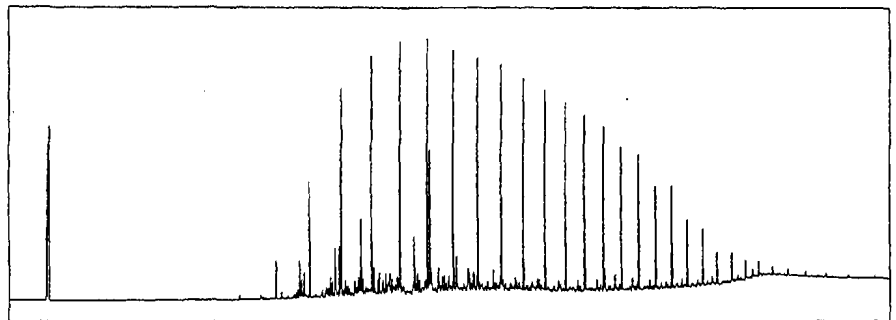
		%C15 + Comp.		$\delta^{13}\text{C}$
API Gravity	N.A.	Sat	56.21	-28.00
% S	N.A.	Arom	9.26	-26.90
ppm V	N.A.	NSO	18.11	
ppm Ni	N.A.	Asph	16.42	
		Sat/Arom	6.07	

Isoprenoid Distribution

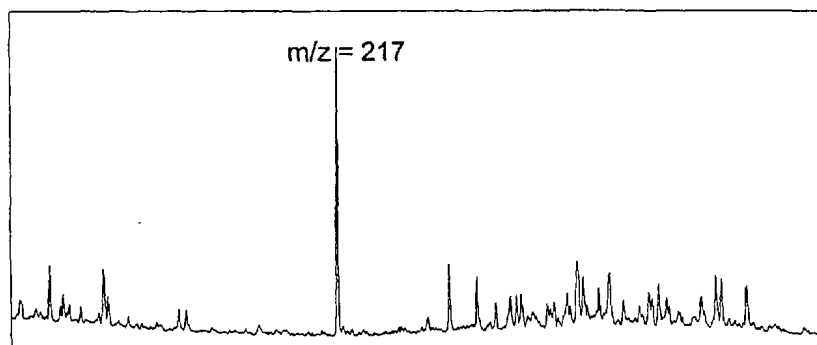
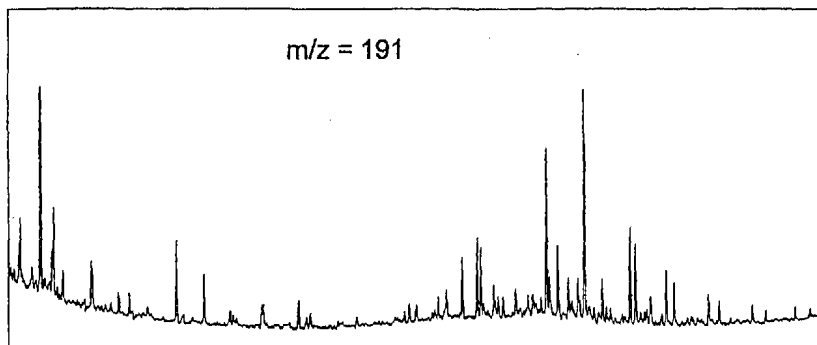


GAS CHROMATOGRAPHY

Pr/Ph	3.75
OEP	1.22
Pr/nC17	0.83
Ph/nC18	0.23



SATURATE BIOMARKERS



Terpane Ratios

C ₂₄ Tetracyclic/C ₂₆ Tricyclics	0.00
C ₁₉ + C ₂₀ Tricyclics/C ₂₃ Tricyclic	1.63
Ts/Tm	0.81
C ₂₈ Hopane/C ₃₀ Hopane	0.00
C ₂₉ Norhopane/C ₃₀ Hopane	0.74
C ₃₀ Oleanane/C ₃₀ Hopane	0.22
Gammacerane/C ₃₀ Hopane	0.05
Tricyclics (%)	32.45
C ₃₅ /C ₃₄ Extended Hopanes	0.61
C ₂₅ Tricyclics/C ₂₆ Tricyclics	1.30

Sterane Ratios

Diasteranes (%)	36.06
20S C ₂₉ Steranes (%)	41.73
$\alpha\beta$ C ₂₉ Steranes (%)	54.67
Hopanes/Steranes	1.46
C ₂₁ Sterane (%)	6.47
C ₂₂ Sterane (%)	2.12
C ₂₇ Sterane (%)	28.66
C ₂₈ Sterane (%)	25.37
C ₂₉ Sterane (%)	37.39
C ₃₀ Sterane (%)	0.00

GAS CHROMATOGRAPHY - MASS SPECTROMETRY

Preliminary Interpretive Guidelines of Saturate Biomarker Ratios

North Aleutian Cost 1

Other ID: MMSAK2003-2 15700 - 16800 Ft.

BaselineDGSi Project: 03/529

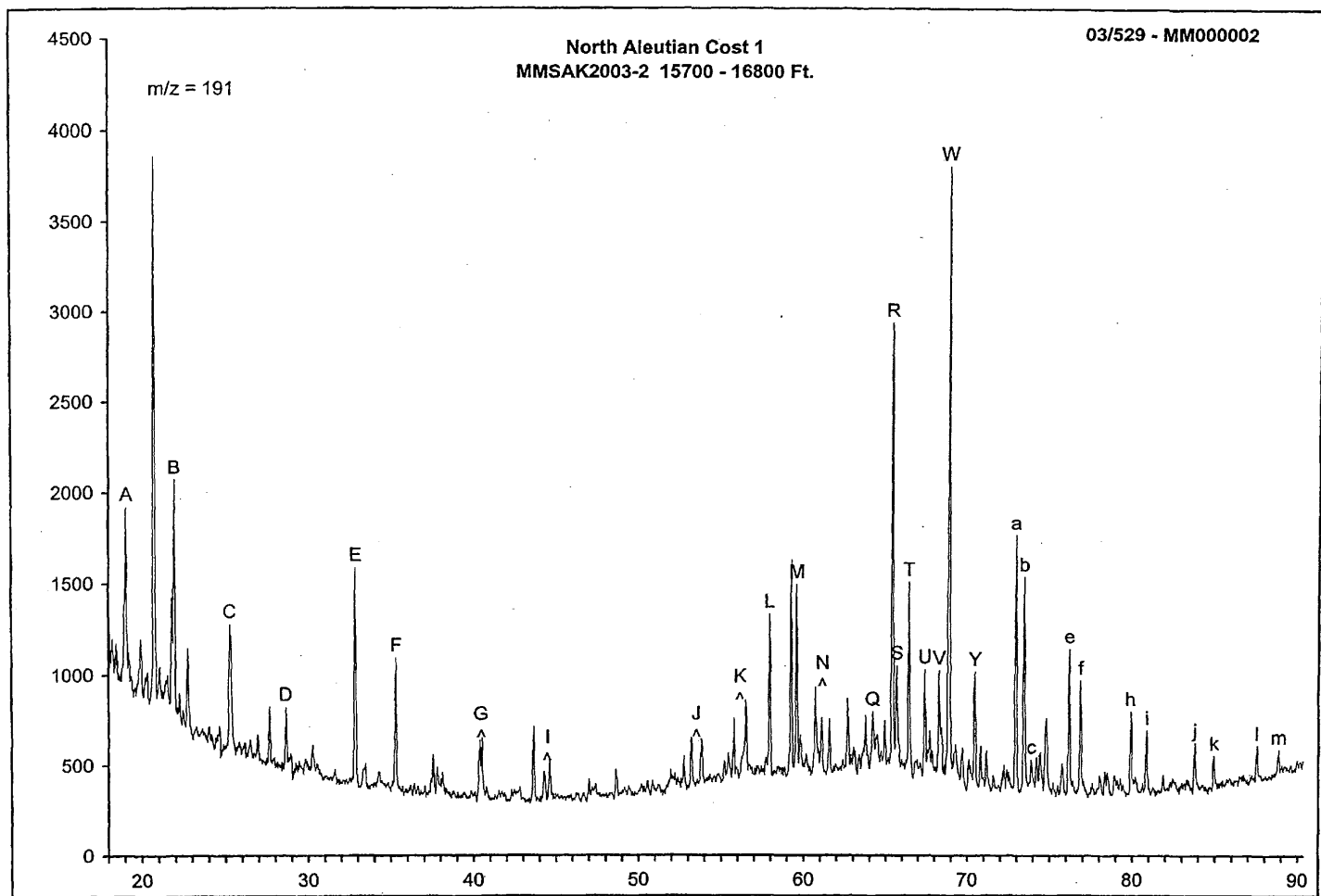
Sample No. MM000002

ORGANIC FACIES AND DEPOSITIONAL ENVIRONMENT

<u>Ratio</u>	<u>Value</u>	<u>Interpretation</u>
C ₁₉ + C ₂₀ Tricyclics / C ₂₃ Tricyclic	1.63	Not diagnostic
C ₂₄ Tetracyclic / C ₂₆ Tricyclics	0.00	Not diagnostic
C ₂₅ Tricyclics / C ₂₆ Tricyclics	1.30	Not diagnostic
C ₂₈ Bishnorhopane / C ₃₀ Hopane	0.00	Not diagnostic
C ₂₉ Norhopane / C ₃₀ Hopane	0.74	Not diagnostic
C ₃₀ Diahopane / C ₃₀ Hopane	0.27	Siliciclastic and/or terrigenous
C ₃₀ Oleanane / C ₃₀ Hopane	0.22	Terrigenous angiosperm input
Gammacerane / C ₃₀ Hopane	0.05	Not lacustrine or hypersaline
% C ₃₁ - C ₃₅ Extended Hopanes	33.2	Marine
C ₃₅ /C ₃₄ Extended Hopanes	0.61	Not diagnostic
Hopane/Sterane	1.46	Marine
% C ₂₇ Steranes	28.7	Mixed source
% C ₂₉ Steranes	37.4	Terrigenous
Diasteranes	36.1	Mixed Source
Isosteranes (abb)	32.5	Not diagnostic
Short-chain steranes	8.6	Not diagnostic
Pristane/phytane	3.7	Marine terrigenous influence

THERMAL MATURITY

Ts / Tm	0.81	Early mature to mature
% C30 Moretane	14.66	Facies-influenced
22S / (22S+22R) C31 Hopane (%)	53.0	Approx. 0.5% Ro equivalent
% 20S/(20S + 20R)	41.7	Between 0.5 and 0.6% Ro equivalent
% abb/(abb + aaa)	54.7	Between 0.6% and 1.0% Ro equivalent
Odd Even Preference	1.22	Low maturity or plant wax influence
Pristane/nC17	0.8	Mature
Phytane/nC18	0.2	Paraffinic



TRITERPANE REPORT (m/z 191)

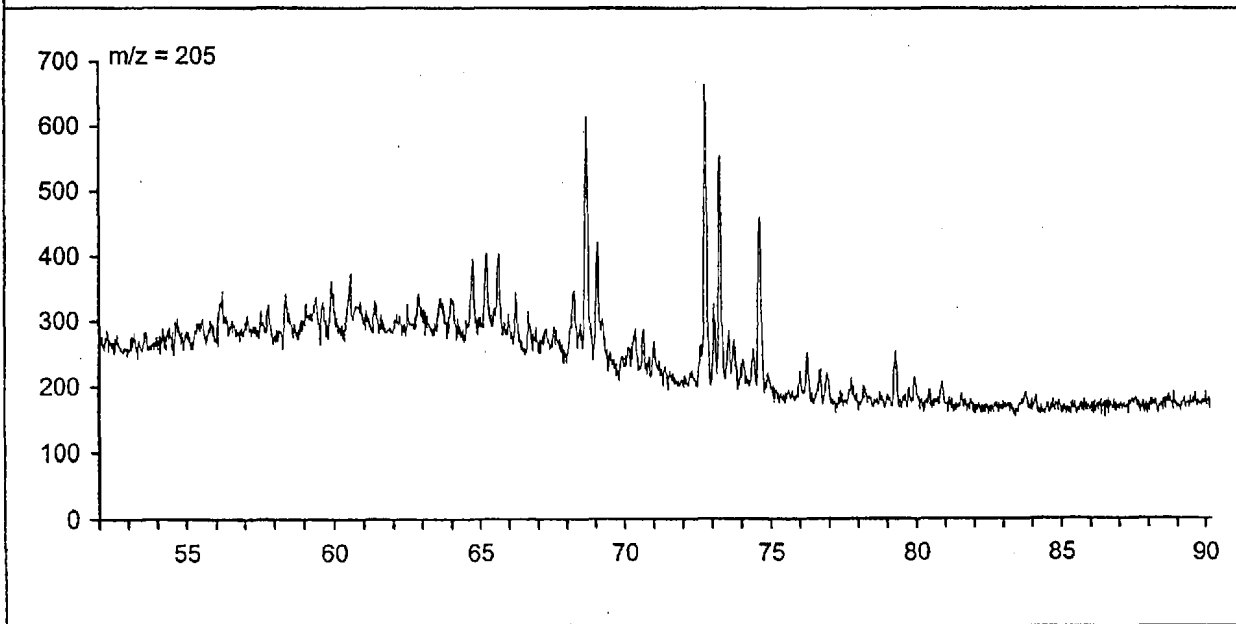
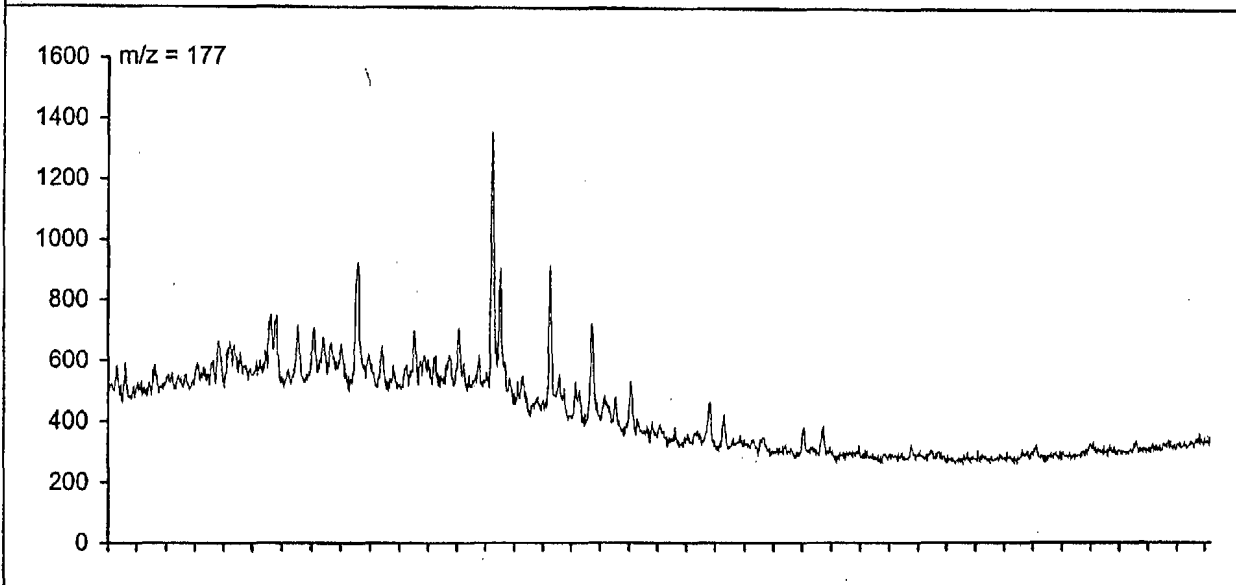
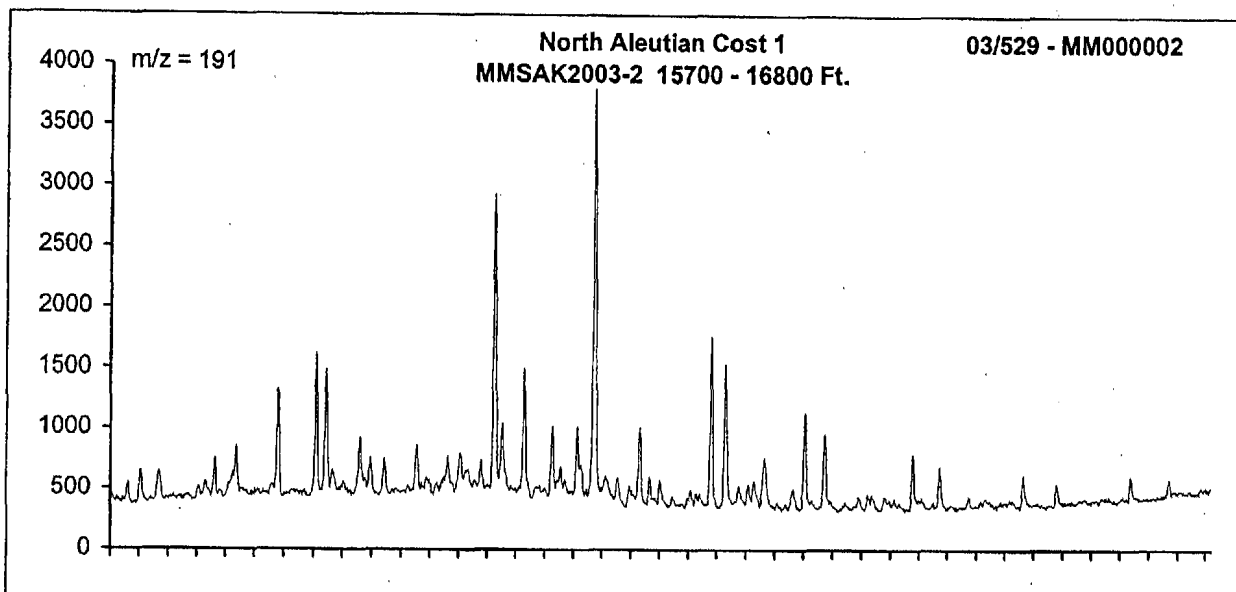
North Aleutian Cost 1

BaselineDGSi Project: 03/529

Sample No. MM000002

Other ID: MMSAK2003-2 15700 - 16800 Ft.

No.	ID	Triterpane Name	Ret Time	Area	Area%	PPM
1	A	C ₁₉ Tricyclic Terpane	19.034	6015	3.38	31
2	B	C ₂₀ Tricyclic Terpane	21.874	7099	3.99	37
3	C	C ₂₁ Tricyclic Terpane	25.203	7122	4.00	37
4	D	C ₂₂ Tricyclic Terpane	28.566	2407	1.35	13
5	E	C ₂₃ Tricyclic Terpane	32.797	8048	4.52	42
6	F	C ₂₄ Tricyclic Terpane	35.238	4641	2.61	24
7	G	C ₂₅ Tricyclic Terpane (22R)	40.295	2186	1.23	11
8	G	C ₂₅ Tricyclic Terpane (22S)	40.417	2148	1.21	11
9	H	C ₂₄ Tetracyclic Terpane		0	0.00	<1
10	I	C ₂₆ Tricyclic Terpane (22R)	44.165	1631	0.92	9
11	I	C ₂₆ Tricyclic Terpane (22S)	44.514	1702	0.96	9
12	J	C ₂₈ Tricyclic Terpane (22R)	53.039	1972	1.11	10
13	J	C ₂₈ Tricyclic Terpane (22S)	53.650	2162	1.21	11
14	K	C ₂₉ Tricyclic Terpane (22R)	55.602	1854	1.04	10
15	K	C ₂₉ Tricyclic Terpane (22S)	56.335	2810	1.58	15
16	L	C ₂₇ 18aH-Trisnorhopane (Ts)	57.764	5802	3.26	30
17	M	C ₂₇ 17aH-Trisnorhopane (Tm)	59.386	7204	4.05	38
18	N	C ₃₀ Tricyclic Terpane (22R)	60.537	3955	2.22	21
19	N	C ₃₀ Tricyclic Terpane (22S)	61.356	2020	1.13	11
20	O	C ₂₈ 17aH,18aH,21bH-28,30-Bisnorhopane		0	0.00	<1
21	P	C ₃₁ Tricyclic Terpane (22R)		0	0.00	<1
22	Q	C ₂₉ 17aH,21bH-25-Norhopane	63.971	2962	1.66	16
23	P	C ₃₁ Tricyclic Terpane (22S)	65.157	0	0.00	<1
24	R	C ₂₉ 17aH,21bH-Norhopane	65.157	17463	9.81	91
25	S	C ₂₉ 18aH-Norneohopane (29Ts)	65.436	4596	2.58	24
26	T	C ₃₀ 17aH-Diahopane	66.185	6489	3.65	34
27	U	C ₂₉ 17bH,21aH-Normoretane	67.162	3698	2.08	19
28	V	C ₃₀ 18aH+18bH-Oleanane	68.034	5242	2.94	27
29	W	C ₃₀ 17aH,21bH-Hopane	68.609	23750	13.34	124
30	X	C ₃₀ 30-Nor-29-homo-17aH-hopane		0	0.00	<1
31	Y	C ₃₀ 17bH,21aH-Moretane	70.196	4081	2.29	21
32	Z	C ₃₃ Tricyclic Terpane (22R)		0	0.00	<1
33	Z	C ₃₃ Tricyclic Terpane (22S)		0	0.00	<1
34	a	C ₃₁ 17aH,21bH-Homohopane (22S)	72.671	9334	5.24	49
35	b	C ₃₁ 17aH,21bH-Homohopane (22R)	73.177	8273	4.65	43
36	c	C ₃₀ Gammacerane	73.613	1236	0.69	6
37	d	C ₃₄ Tricyclic Terpane (22R)		0	0.00	<1
38	d	C ₃₄ Tricyclic Terpane (22S)		0	0.00	<1
39	e	C ₃₂ 17aH,21bH-Bishomohopane (22S)	75.897	5228	2.94	27
40	f	C ₃₂ 17aH,21bH-Bishomohopane (22R)	76.577	3989	2.24	21
41	g	C ₃₅ Tricyclic Terpane (22R)		0	0.00	<1
42	g	C ₃₅ Tricyclic Terpane (22S)		0	0.00	<1
43	h	C ₃₃ 17aH,21bH-Trishomohopane (22S)	79.593	3043	1.71	16
44	i	C ₃₃ 17aH,21bH-Trishomohopane (22R)	80.552	2329	1.31	12
45	j	C ₃₄ 17aH,21bH-Tetrahomohopane (22S)	83.446	2093	1.18	11
46	k	C ₃₄ 17aH,21bH-Tetrahomohopane (22R)	84.579	1341	0.75	7
47	l	C ₃₅ 17aH,21bH-Pentahomohopane (22S)	87.142	1295	0.73	7
48	m	C ₃₅ 17aH,21bH-Pentahomohopane (22R)	88.467	802	0.45	4



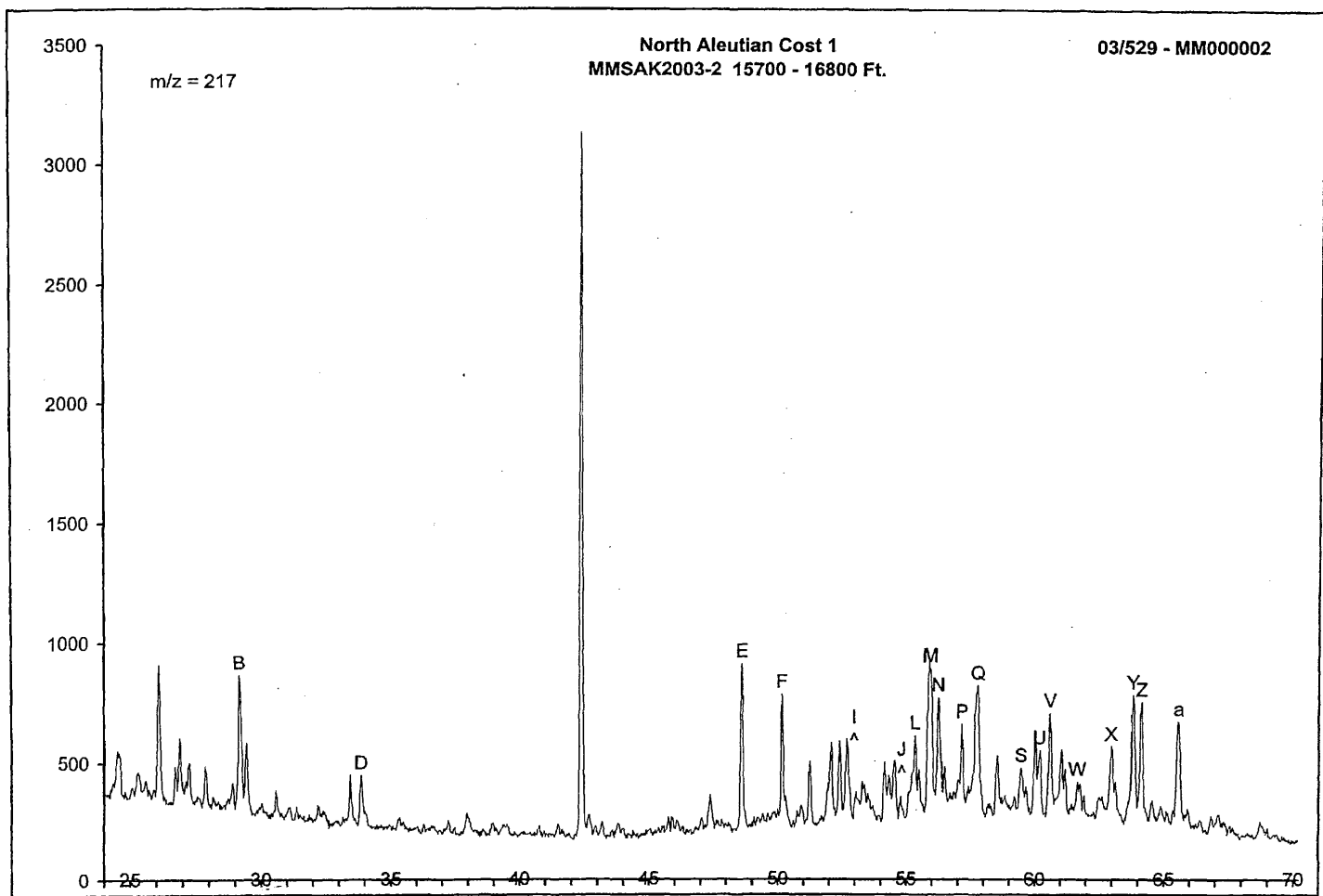
STERANE REPORT (m/z 217)

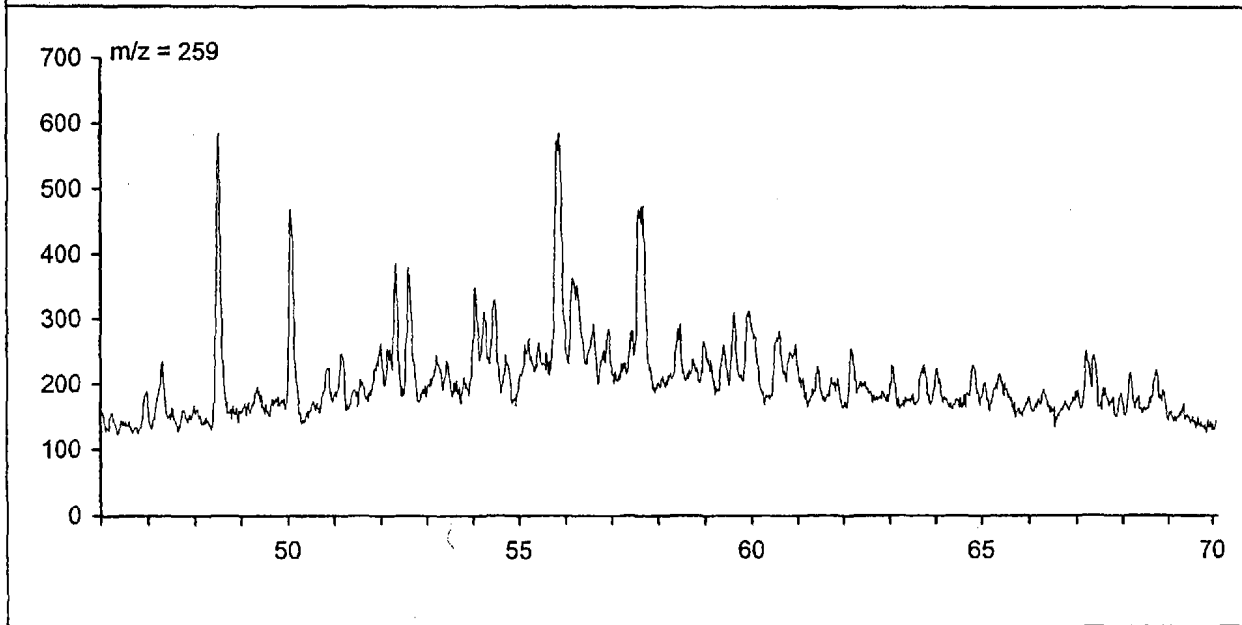
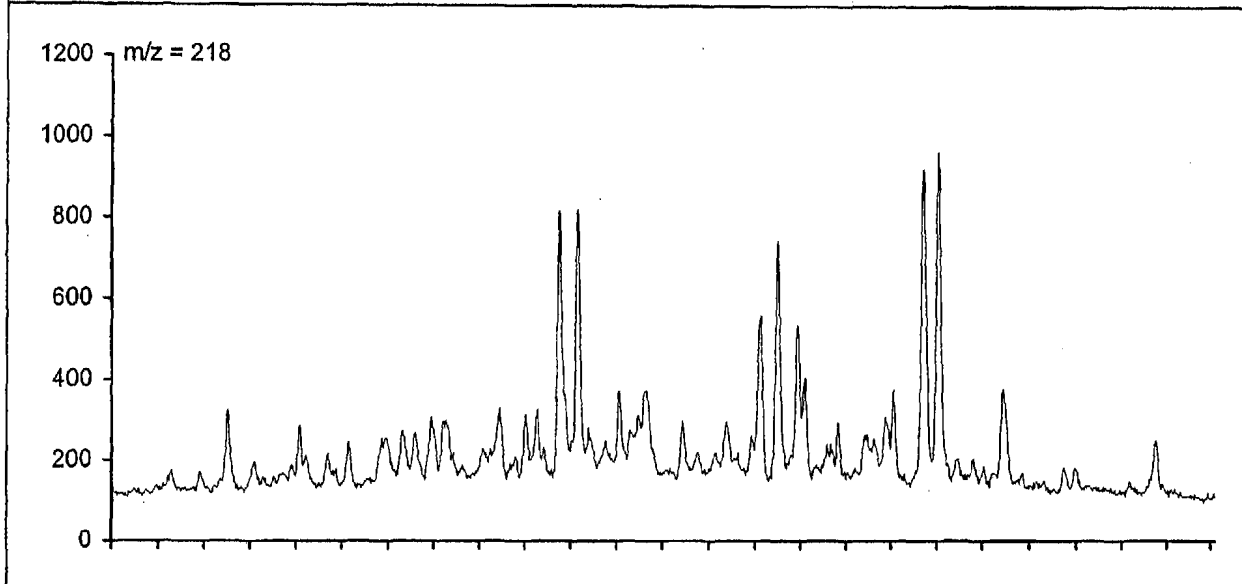
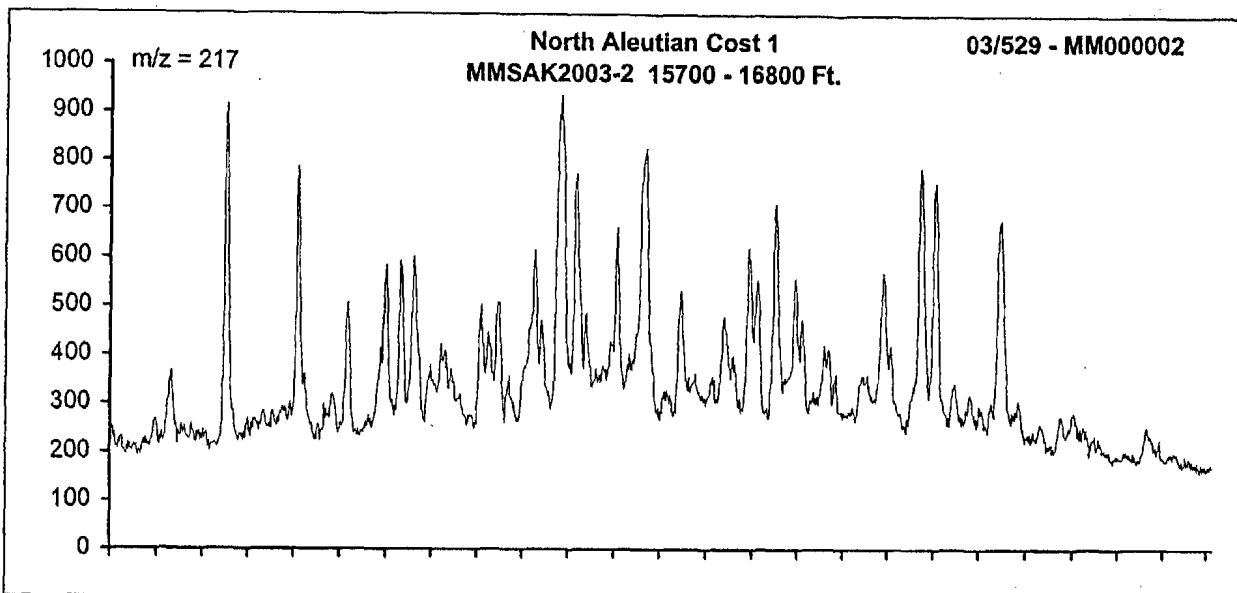
North Aleutian Cost 1

BaselineDGSi Project: 03/529

Sample No. MM000002

No.	ID	Sterane Name	Ret Time	Area	Area%	PPM
1	A	C ₂₁ diasterane		0	0.00	<1
2	B	C ₂₁ abb sterane	29.12	5052	6.47	26
3	C	C ₂₂ diasterane		0	0.00	<1
4	D	C ₂₂ abb sterane	33.86	1651	2.12	9
5	E	C ₂₇ ba diasterane (20S)	48.51	4657	5.97	24
6	F	C ₂₇ ba diasterane (20R)	50.06	3373	4.32	18
7	G	C ₂₇ ab diasterane (20S)		0	0.00	<1
8	H	C ₂₇ ab diasterane (20R)		0	0.00	<1
9	I	C ₂₈ ba diasterane (20S)	52.29	5534	7.09	29
10	J	C ₂₈ ba diasterane (20R)	54.03	2876	3.68	15
11	K	C ₂₈ ab diasterane (20S)		0	0.00	<1
12	L	C ₂₇ aaa sterane (20S)	55.22	2365	3.03	12
13	M	C ₂₇ abb ster-(20R)+C ₂₉ ba dia-(20S)	55.78	8460	10.84	44
14	N	C ₂₇ abb sterane (20S)	56.11	4792	6.14	25
15	O	C ₂₈ ab diasterane (20R)		0	0.00	<1
16	P	C ₂₇ aaa sterane (20R)	57.00	2951	3.78	15
17	Q	C ₂₉ ba diasterane (20R)	57.63	7475	9.58	39
18	R	C ₂₉ ab diasterane (20S)		0	0.00	<1
19	S	C ₂₈ aaa sterane (20S)	59.30	2295	2.94	12
20	T	C ₂₉ ab diasterane (20R)		0	0.00	<1
21	U	C ₂₈ abb sterane (20R)	60.03	2565	3.29	13
22	V	C ₂₈ abb sterane (20S)	60.43	4212	5.40	22
23	W	C ₂₈ aaa sterane (20R)	61.50	2317	2.97	12
24	X	C ₂₉ aaa sterane (20S)	62.80	3306	4.24	17
25	Y	C ₂₉ abb sterane (20R)	63.62	5296	6.79	28
26	Z	C ₂₉ abb sterane (20S)	63.95	4258	5.46	22
27	a	C ₂₉ aaa sterane (20R)	65.37	4617	5.92	24
28	b	C ₃₀ aaa sterane (20S)		0	0.00	<1
29	c	C ₃₀ abb sterane (20R)		0	0.00	<1
30	d	C ₃₀ abb sterane (20S)		0	0.00	<1
31	e	C ₃₀ aaa sterane (20R)		0	0.00	<1





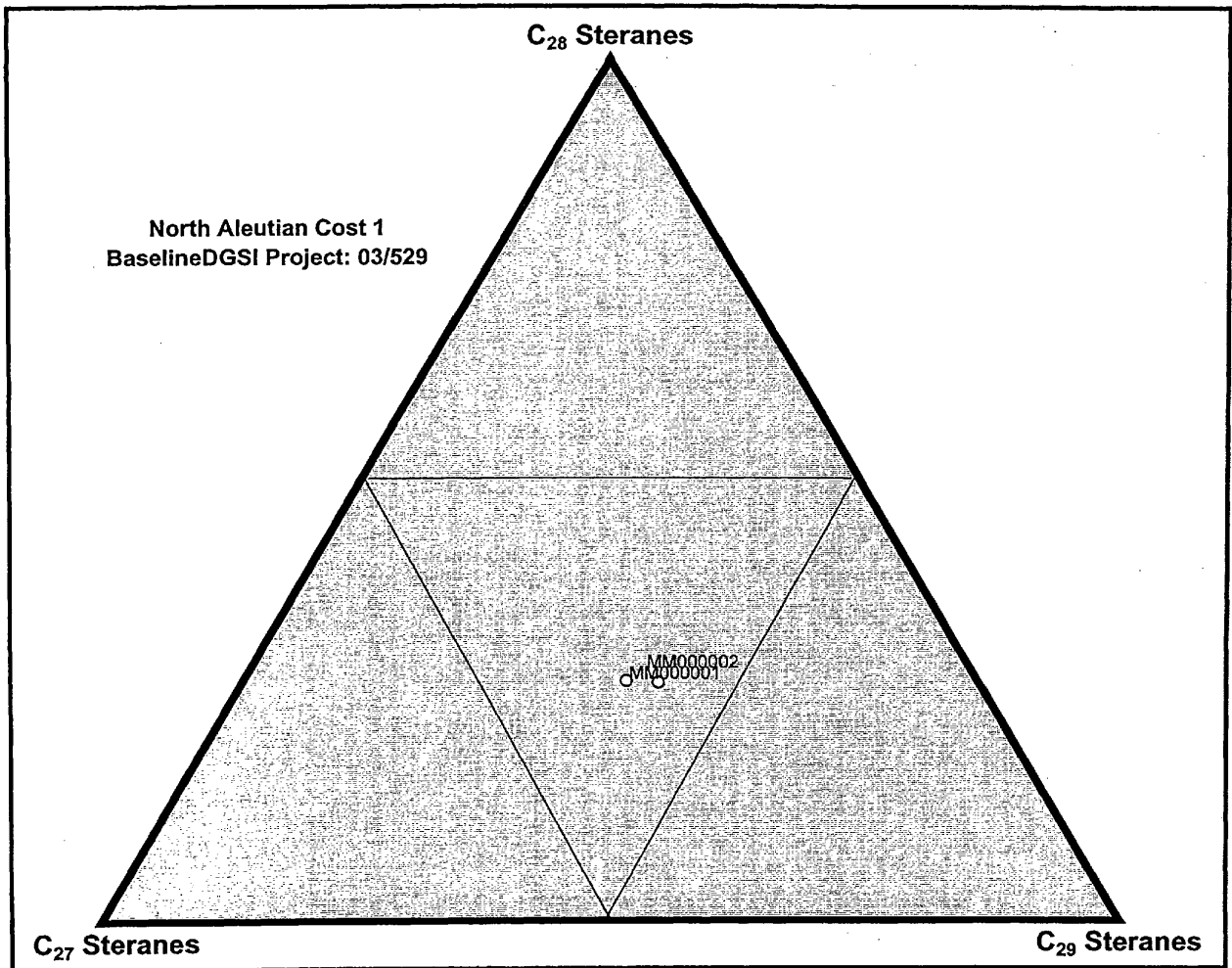


FIGURE 9 - Distribution of C27-C29 regular steranes from gc-ms data.

Isotope DataFrom: Bob Olson [BOlson@baselinedgsi.com]
Sent: Wednesday, November 05, 2003 10:49 AM
To: Sherwood, Kirk
Subject: RE: Isotope Data--Confirming Receipt

Kirk

The weights are correctly reported. The samples sent were very large so we did not pulverize and split all of each sample. Furthermore, one is composed of chips taken from conventional cores between 16006.0 and 16029 and between 16701.2 and 16720 ft (approximately a 42 ft interval). In contrast, the second sample is a composite of cuttings between 15700 and 16800 (an 1100 ft interval). These are not the same samples. I would expect some differences due to the differences in sample type, sampling process (core chips might be focused on concentrations of stain, fractures...) and due to sample not being homogeneous. Although the difference in amount of extract may be unexpected I believe it to be real.

Regarding the differences in extract weight between the Soxhlet report and the starting weight in the MPLC report for sample #1 (core chips), we had such a small quantity of bitumen remaining after precipitation of asphaltenes that we had to extracted additional material in order to have enough bitumen for the MPLC separation. Reported in the Soxhlet table are the quantities originally extracted. We did not quantify the additional extractions- only the amount of bitumen used in the MPLC/de-asphalting process.

Regarding the total of the Sat + Aro + NSO + Asph. not equaling the total weight put on the column in the MPLC report. We are never able to account for all of the sample. Some material is not eluted from the column and some material may be lost during evaporation of solvents. Allocation of that lost material is always difficult. I would be cautious about simply calling it NSOs and instead refer to it as 'Material Unaccounted for by this Process'.

-----Original Message-----

From: Kirk.Sherwood@mms.gov [mailto:Kirk.Sherwood@mms.gov]
Sent: Wednesday, November 05, 2003 1:00 PM
To: Bob Olson
Subject: RE: Isotope Data--Confirming Receipt

Thanks Bob.

I looked at the MPLC data and the two samples are very different-surprisingly so considering that they come from the same interval. Can you double-check the quantities to make sure that they are reported correctly?

For sample MMSAK2003-1 the Soxhlet report lists a net extract weight of 0.0347 g. On the MPLC report the sample weight is reported as 0.4832, which seems to be inconsistent. For sample MMSAK2003-1 the net extract weight (Soxhlet) and the sample weight (MPLC) are both given as 0.0609 g, which seems consistent and correct.

In the Soxhlet report, the sum of SAT+ARO+NSO+ASPH is less than the sample weight. Any thoughts about what is not accounted for? Resin?

Kirk W. Sherwood, Geologist
Minerals Management Service
949 E. 36th Ave., Veco Bldg., Suite 300
Anchorage, AK 99508-4362
Ph: 907-271-6085
Fx: 907-271-6565
e-mail: kirk.sherwood@mms.gov



United States Department of the Interior



MINERALS MANAGEMENT SERVICE
Alaska Outer Continental Shelf Region
949 East 36th Avenue, Suite 300
Anchorage, Alaska 99508-4363

03 September 2003

Attn: Dr. Bob Olson
Baseline DGSI
8701 New Trails Drive
The Woodlands, TX
77381-4241

Tel: 281-681-2200

Re: Extraction and Biomarker/Isotope Analyses, North Aleutian Basin COST 1 Well

Dear Bob,

I have separately forwarded via FEDEX two samples from the captioned well for extraction and biomarker and isotope analysis. A detailed list of the desired analyses, as per previous e-mail dialog between us, is attached. A copy of this letter will also accompany the samples.

Sample MMSAK2003-1 is a composite of 47 conventional core samples from cores 18 and 19 and representing the intervals 16,006.0 to 16,029.0 feet and 16,701.2 to 16,720.0 feet (bkb). The composite sample weighs 1 lb 14 oz. The only possible contaminant noted was some clear, amber-colored epoxy or plastic that coated the core slabs, I presume that the coating was applied to help keep core slabs together during handling. We tried to keep this material out of our composite, but some may have crept in anyway. Some of these core materials were extracted in previous studies and gas chromatograms of C15+ saturate fraction hydrocarbons were obtained by Robertson Research. Copies of these analyses are attached for your information.

Sample MMSAK2003-2 is a composite of cuttings from 109 well cuttings samples representing 10-foot intervals from 15,700 to 16,800 feet (bkb), capturing a zone associated with high (>80%) wetness ratios ($[C2+C3+C4]/[C1+C2+C3+C4]$) in headspace gas from canned cuttings samples. A copy of the headspace wetness ratios is attached. The composite sample weighs 3 lbs. These cuttings were delivered here as unwashed "wet" cuts that were subsequently dried at room temperatures by simply leaving the bags open. Regarding contaminants, in section 2.2 of their geochemical report for this well, EXLOG notes that:

"Inorganic contaminants encountered in this well consisted of cement, iron filings, aluminum filings, and mica. Organic contaminants included lubra beads, rubber, paint, wood, pipe dope, rope fibers, and walnut shells. These contaminants generally were easily removed and therefore did not hinder geochemical analysis."

These are public samples archived by the State of Alaska and they have granted us permission to carry out these destructive analyses contingent upon returning any unused and residual materials and submission of a copy of the data. Therefore, I ask that you please return any unused and/or residual materials to me at the address given at the letterhead. Unused materials might be useful for future extractions and comparative studies by other parties.

The MMS contact for financial matters related to this work is Dr. Pulak Ray, Chief Geologist, Minerals Management Service, Resource Evaluation, 381 Elden Street, Herndon, VA, 20170-4842, (Ph: 703-787-1511; e-mail pulak.ray@mms.gov). Other questions should be referred to me at kirk.sherwood@mms.gov or by phone at 907-271-6085.

Thanks!

Kirk W. Sherwood

-----Original Message-----

From: Bob Olson [mailto:BOlson@baselinedgsi.com]

Sent: Monday, November 03, 2003 1:32 PM

To: Sherwood, Kirk

Subject: RE: Isotope Data--Confirming Receipt

Kirk

The zip file that I sent you contains a folder 'Minerals Management Service_092603'

Within that folder are the following folders:

GCMS_SAT folder

REPORTS folder

CD.KEY

Peakview.exe

Within the Reports folder are the Sat fraction GCMS reports. Their main function is to provide you with a tabulation of the identified peak areas and peak quantification along with some commonly used ratios.

Peakview.exe is a utility program that allows you to view and manipulate the GCMS ion chromatograms. More in a moment-

CD.key is a security key that allows you to use PeakView.

GCMS_SAT folder contains the GCMS raw data files that PeakView reads.

To view, enlarge or print an ion chromatogram (i.e. m/z191 or m/z217) do the following:

1) Open the GCMS_SAT folder

2) Open either M2031201.d (sample MMSAK2003-2) or M2031232.d (sample MMSAK2003-1)

3) Double click on the DATA.MS file

Peakview should launch and the total ion chromatogram should be displayed.

To view a specific ion chromatogram:

1) Click on the ION button on the Peakview tool bar

Choose the ion(s) of interest by highlighting each on the list. To highlight more than 1 hold down the Ctrl button on the keyboard.

2) Click ok

The ion chromatograms should be displayed.

You can now enlarge, turn on or off retention times, annotation...

Sorry that I did not explain all of this to you earlier- I assumed that you were familiar with our format but then came to realize the work we had done for you previously was before PeakView.

Let me know if you have any additional problems.

Let me know if you experience nay additional problems.

Bob