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10. *DATA REPORT:* MAJOR AND TRACE ELEMENT COMPOSITION, STRONTIUM, NEODYMIUM, AND OXYGEN ISOTOPE RATIOS, AND MINERAL COMPOSITIONS OF SAMPLES[1]

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INTRODUCTION

Thirty-five samples from the drill core of the three Leg 163 sites (Sites 988, 989, and 990) off the southeast coast of Greenland were analyzed for 27 major, minor, and trace elements by X-ray fluorescence (XRF) and for 25 trace elements, including 14 rare-earth elements (REEs), by an inductively coupled plasma source mass spectrometer (ICP/MS). Sr- and Nd-isotope data are reported for seven samples and oxygen-isotope data are reported for 19 plagioclase separates. In addition, a reconnaissance survey of the composition of the main mineral phases, plagioclase, pyroxene, and oxides was determined on an electron microprobe to provide the basic information required for petrogenetic modeling. Olivine pseudomorphs are present in many of the samples, but in no case was an olivine grain found that was fresh enough to give a reliable analysis.

The chemical and isotopic data recorded here were determined to provide a comparison with the larger data sets acquired by the Edinburgh, Copenhagen, and Leicester laboratories from both Legs 152 and 163 drill cores. This will permit a detailed comparison of the North Atlantic flood basalt province as a whole with the better known Columbia River, Deccan, and Karoo continental flood basalt provinces, for which substantial chemical data sets are already available at Washington State University.

METHODS

XRF Analysis

All 35 samples were analyzed on a fully automated Rigaku 3370 spectrometer in the GeoAnalytical Laboratory at Washington State University (Table 1). The laboratory uses a rock powder $Li_2B_4O_7$ (1:2) mixture fused in a carbon crucible in a muffle furnace at 1000°C to form a single glass bead that is used for the analysis of both major and trace elements. The detailed procedures, including the tabulated precision and estimates of accuracy (including comparison with data from other laboratories and techniques) are given in Hooper et al. (1993) and in Johnson et al. (1997).

ICP/MS Analysis

The same 35 samples were also analyzed on a Sciex Elan (model 250) ICP/MS for the 14 REEs and 11 other trace elements (Table 1). Ba, Nb, Y, Pb, Rb, and Sr duplicate the XRF analyses. Of these, the values for Ba, Nb, and Pb by ICP/MS are preferred at the relatively low abundances present in these rocks, while the XRF values for Y, Rb, and Sr are the more precise. The analytical techniques employed for the ICP/MS data are described in detail by Knaack et al. (1994), which includes precision determinations for each element and comparisons with data from other laboratories as a measure of absolute accuracy.

Isotope Analysis

Seven samples were analyzed at the University of Alberta for Sr and Nd isotopes under the direction of Dr. R.A. Creaser (Table 2). Sample preparation followed standard procedures, modified from Richard et al. (1976). Samples were dissolved in concentrated HF at ~120°C for at least 48 hr. This was followed by HNO_3 treatment and conversion to chloride salts using concentrated HCl. Sr and REEs were separated from the whole sample by passing the sample through calibrated ion exchange columns. Sr separates were passed through a second calibrated ion exchange column before analysis. Nd and Sm were separated from the other REEs by passing through di-2-ethylhexyle–coated teflon powder columns, and were then analyzed.

Sr samples were analyzed on a VG Micromass 30 single-collector mass spectrometer. Results were standardized using National Bureau Standard 987 with an $^{87}Sr/^{86}Sr$ value of 0.71025. Nd and Sm samples were analyzed on a VG Micromass 354 fully automated multiple collector mass spectrometer, and samples were standardized to an internal standard, which ran true to La Jolla standard value of 0.511848, so no correction was made.

Oxygen isotope data were determined on plagioclase separates from 19 samples. The isotope ratios are reported in the familiar ? notation, relative to V-SMOW (Vienna-standard mean ocean water). Conventional fluorination techniques (Clayton and Mayeda, 1963) were used to extract O_2 from the powdered samples. ClF_3 was used as an oxidizing agent (Borthwick and Harmon, 1982). O_2 was converted to CO_2 on a resistance-heated carbon rod. The isotope ratio of this gas was measured on a gas source, isotope ratio, mass spectrometer in the geochemical laboratories at Washington State University. Raw data were corrected to an NBS-28 (African glass sand) value of 9.58‰, using the in-house standard MM-1 (Mica Mountain pegmatite quartz) which has a value of 12.9‰ on the NBS-28 scale. Replicate analyses of MM-1 show a standard deviation of <0.2‰.

Mineral Analysis

A precursory survey of the compositions of the main mineral phases, plagioclase, pyroxene, and oxides, is presented in Table 3 (on CD-ROM, back pocket, this volume). Olivine pseudomorphs are also present in many samples but no fresh olivine, from which reliable compositions could be obtained, was found.

The mineral compositions were determined on an automated Cameca Camebax Microelectron microprobe with four wave-length dispersive spectrometers. The standards used were supplied by Charles Taylor (Na = albite #4, Mn = spessartine garnet, K = MAD-10 orthoclase, Mg = olivine #1, Ni = olivine #1, Cr = USNM 746, Johnston meteorite hypersthene, Ca = diopside #1, Al = kyanite #1, Ti = sphene #1, Si = diopside #1, Ba = NBS glass, K373.), using 10-s counts with a 4µ-beam at 20 KV and 13 nA. The probe's analytical data were corrected for atomic number, absorption, and fluorescence effects.

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Table 1. Leg 163 XRF and ICP/MS analysis.

Leg:	163	163	163	163	163	163	163	163	163	163	163	163	163	163	163
Hole:	988A	988A	988A	989B	989A	989B	989B	989B	989B	989B	989B	989B	989B	990A	990A
Sample:	1R-1-98	3R-2, 00 ILS	4R-1, 69	1R-4, 59	2R-3, 68 ILS	4R-4, 87	5R-3, 75	6R-7, 112	7R-5, 88	9R-5, 80	10R-7, 77	11R-1, 6	12R-1, 79	5R-4, 25	6R-3, 9
Original total:	100.20	99.66	99.04	100.26	99.84	99.84	99.87	99.87	100.35	100.10	100.24	99.96	99.74	100.18	100.05
LOI (%):	1.67	1.77	1.47	1.42	1.58	1.70	1.79	2.19	1.90	1.84	2.25	0.54	0.46	1.09	0.94
XRF	Major elements normalized (wt%):														
SiO_2	48.84	49.05	48.94	50.88	50.63	50.61	51.02	50.75	50.81	50.84	50.75	50.66	50.43	51.60	51.57
Al_2O_3	14.13	14.61	14.16	13.75	13.80	13.73	13.64	14.03	13.75	13.41	13.63	14.37	14.31	14.08	14.21
TiO_2	†2.72	2.47	2.42	1.13	1.07	1.10	1.16	1.03	1.06	1.24	1.16	0.92	0.93	1.27	1.17
FeO*	13.60	12.42	13.58	13.03	12.86	13.08	13.27	12.30	12.81	13.87	13.46	11.49	11.56	12.99	12.53
MnO	0.204	0.235	0.213	0.230	0.222	0.226	0.236	0.211	0.226	0.233	0.211	0.207	0.202	0.199	0.206
CaO	10.83	11.32	11.10	11.49	11.78	11.74	11.32	11.65	11.41	10.87	10.53	12.48	12.55	10.57	10.83
MgO	6.00	6.58	6.20	7.02	7.23	7.15	6.88	7.71	7.48	6.96	7.69	7.67	7.86	6.34	6.68
K_2O	0.45	0.27	0.35	0.10	0.05	0.06	0.06	0.05	0.08	0.10	0.12	0.09	0.04	0.22	0.16
Na_2O	2.94	2.78	2.75	2.27	2.25	2.20	2.32	2.19	2.28	2.38	2.35	2.04	2.05	2.63	2.53
P_2O_5	0.278	0.260	0.293	0.102	0.099	0.091	0.103	0.089	0.091	0.110	0.102	0.078	0.079	0.114	0.108
XRF	Trace elements (ppm):														
Ni	47	56	48	59	64	63	53	70	65	48	52	82	84	43	41
Cr	124	140	127	57	66	59	46	70	63	51	51	221	214	46	55
Sc	40	39	40	45	47	49	45	45	47	44	43	47	46	44	41
V	415	396	391	366	350	381	369	337	359	411	380	298	306	387	381
Ba	151	127	141	17	26	19	19	11	22	26	29	28	13	59	49
Rb	4	1	2	0	0	0	0	0	0	1	0	1	0	2	0
Sr	227	222	226	75	74	73	77	70	70	72	71	83	84	99	99
Zr	158	147	164	63	62	58	64	55	57	68	64	50	51	71	66
Y	37	34	38	31	30	27	31	26	28	33	29	24	23	33	30
Nb	18.2	16.6	19.1	2.8	3.7	2.9	4.0	3.5	4.0	3.3	3.8	2.3	3.4	4.2	3.6
Ga	21	25	20	18	17	13	16	15	15	19	15	16	17	15	19
Cu	†296	†202	†183	†199	†186	†193	†211	†188	†190	†227	†210	†150	†153	†238	†198
Zn	112	104	110	93	89	90	101	89	92	99	97	75	80	105	98
Pb	0	1	0	0	0	0	0	0	0	0	1	0	4	0	0
Th	1	3	1	0	0	1	0	0	0	1	2	0	1	2	0
ICP/MS	Trace elements (ppm):														
La	16.61	15.15	17.41	2.76	2.65	2.46	2.88	2.30	2.58	3.02	2.81	2.54	2.56	5.07	4.69
Ce	36.40	33.73	38.43	6.86	6.51	6.04	7.18	5.69	6.39	7.60	6.86	5.89	5.89	11.01	10.28
Pr	4.77	4.43	4.96	1.11	1.07	0.98	1.15	0.94	1.03	1.23	1.11	0.93	0.96	1.59	1.46
Nd	22.15	20.83	23.16	6.07	5.84	5.36	6.28	5.15	5.61	6.83	5.86	4.92	5.12	8.06	7.54
Sm	6.46	5.93	6.54	2.55	2.41	2.28	2.64	2.20	2.38	2.81	2.49	2.09	2.09	3.03	2.89
Eu	2.24	2.07	2.22	1.01	0.97	0.91	1.05	0.87	0.93	1.10	0.98	0.84	0.86	1.18	1.11
Gd	7.24	6.71	7.27	3.82	3.64	3.50	4.01	3.27	3.57	4.34	3.83	3.07	3.12	4.41	4.13
Tb	1.21	1.12	1.19	0.75	0.72	0.68	0.78	0.65	0.70	0.82	0.73	0.60	0.61	0.83	0.79
Dy	7.38	7.00	7.48	5.31	5.07	4.83	5.47	4.57	5.01	5.95	5.14	4.19	4.27	5.86	5.49
Ho	1.52	1.38	1.49	1.17	1.14	1.08	1.24	1.02	1.11	1.33	1.13	0.92	0.94	1.30	1.20
Er	4.03	3.69	3.99	3.38	3.30	3.18	3.54	2.98	3.21	3.81	3.27	2.64	2.70	3.74	3.47
Tm	0.55	0.52	0.56	0.50	0.49	0.46	0.53	0.44	0.48	0.57	0.50	0.40	0.40	0.55	0.51
Yb	3.39	3.13	3.37	3.18	3.15	2.93	3.38	2.81	3.03	3.63	3.26	2.50	2.56	3.49	3.20
Lu	0.51	0.47	0.50	0.52	0.50	0.47	0.53	0.45	0.47	0.58	0.51	0.39	0.40	0.56	0.51
Ba	111	100	114	20	15	16	19	16	20	22	24	31	20	59	58
Th	1.29	1.14	1.32	0.19	0.19	0.17	0.19	0.16	0.18	0.21	0.22	0.16	0.16	0.39	0.37
Nb	19.99	17.42	19.61	2.77	2.67	2.48	2.87	2.40	2.65	3.14	2.83	1.99	2.02	3.24	3.06
Y	38.93	36.52	39.65	30.83	29.94	28.87	33.25	27.31	29.99	35.51	30.09	24.95	25.01	35.49	32.10
Hf	4.35	3.95	4.34	1.71	1.68	1.52	1.79	1.48	1.61	1.95	1.75	1.32	1.35	1.98	1.89
Ta	1.23	1.09	1.20	0.18	0.18	0.16	0.18	0.15	0.17	0.20	0.18	0.12	0.13	0.19	0.18
U	0.42	0.31	0.38	0.06	0.06	0.05	0.06	0.05	0.06	0.07	0.06	0.04	0.04	0.06	0.06
Pb	1.24	1.28	1.43	0.12	0.17	0.09	0.12	0.20	0.23	0.17	0.16	0.13	0.17	0.57	0.51
Rb	5.4	2.0	3.5	1.0	0.5	0.8	0.7	0.6	1.0	1.1	2.1	1.1	0.2	2.1	1.3
Cs	0.04	0.04	0.06	0.01	0.01	0.01	0.00	0.01	0.01	0.01	0.02	0.01	0.00	0.01	0.01
Sr	248	240	244	77	77	78	86	75	77	77	78	89	90	108	109

Note: † = the value is outside the range of the standards used.

Table 1 (continued).

Leg:	163	163	163	163	163	163	163	163	163	163	163	163	163	163	163
Hole:	990A	990A	990A	990A	990A	990A	990A	990A	990A	990A	990A	990A	990A	990A	990A
Sample:	7R-1, 62	7R-3, 4	8R-4, 49	9R-2, 93	10R-3, 32	11R-1, 85	12R-1, 33	13R-3, 124	14R-3, 30	15R-2, 35	16R-3, 35	17R-4, 38	18R-2, 62	19R-5, 85	20R-4, 125
						ILS									
Original total:	100.48	99.84	99.77	99.81	100.13	99.93	100.54	100.18	100.23	100.58	100.18	100.91	100.61	100.39	100.29
LOI (%):	0.93	0.95	1.52	0.77	0.87	0.69	0.64	2.00	1.55	0.92	2.34	1.34	2.04	1.53	2.88
XRF															
SiO_2	52.12	51.48	51.36	51.11	51.16	50.98	51.12	50.81	51.01	50.96	51.02	51.19	51.17	51.03	50.14
Al_2O_3	13.83	13.67	15.32	15.38	15.23	15.37	15.47	15.17	16.27	15.35	14.80	15.25	14.94	14.60	16.78
TiO_2	1.24	1.24	0.92	0.99	0.94	0.96	0.97	0.96	0.99	0.92	0.96	1.00	0.94	0.95	0.74
FeO^*	12.58	13.93	11.17	10.92	11.24	11.13	10.52	11.31	9.44	11.06	11.52	10.46	9.68	10.69	9.62
MnO	0.227	0.225	0.204	0.182	0.224	0.201	0.191	0.196	0.181	0.201	0.182	0.232	0.182	0.217	0.221
CaO	10.56	10.44	11.45	11.83	11.64	11.84	12.11	11.78	12.24	11.94	11.50	12.01	12.60	12.01	11.98
MgO	6.71	6.24	7.10	7.00	7.06	6.93	6.98	7.26	7.15	7.12	7.44	7.27	8.03	8.23	8.13
K_2O	0.21	0.25	0.21	0.18	0.16	0.14	0.18	0.15	0.14	0.11	0.10	0.07	0.09	0.10	0.08
Na_2O	2.41	2.40	2.20	2.31	2.27	2.36	2.35	2.29	2.48	2.26	2.40	2.43	2.28	2.09	2.24
P_2O_5	0.114	0.112	0.090	0.097	0.091	0.091	0.099	0.084	0.089	0.083	0.087	0.094	0.085	0.077	0.065
XRF															
Ni	42	36	60	58	67	67	68	73	78	69	68	68	83	79	87
Cr	53	48	138	133	142	140	136	148	154	148	171	171	227	209	252
Sc	43	44	43	43	35	37	†52	44	46	42	39	44	44	47	38
V	382	377	293	310	288	301	300	311	321	311	301	315	304	309	254
Ba	43	59	41	71	70	62	70	30	40	37	179	38	40	22	14
Rb	2	2	1	2	0	0	1	2	0	0	0	0	0	1	0
Sr	97	95	115	121	118	123	123	92	95	92	115	116	110	75	98
Zr	67	71	57	60	59	60	60	56	57	55	58	61	49	50	46
Y	30	33	24	24	25	24	24	25	25	25	25	25	22	24	20
Nb	3.6	4.3	3.4	3.9	2.4	3.1	2.8	1.5	3.0	2.6	2.5	3.0	2.6	3.0	1.9
Ga	17	17	15	18	18	17	15	18	18	14	14	18	15	17	11
Cu	102	†272	†158	†160	132	147	†171	115	†326	†153	†264	†151	†174	†173	49
Zn	102	97	77	79	81	80	80	82	87	85	78	82	75	85	66
Pb	0	2	0	1	1	2	0	0	0	0	0	1	0	0	0
Th	2	0	0	0	0	2	0	1	0	1	0	1	0	1	1
ICP/MS															
La	4.63	5.09	4.24	4.42	4.28	4.31	4.51	3.54	3.47	3.39	4.13	4.48	3.51	2.54	2.88
Ce	10.42	11.12	9.14	9.83	9.23	9.55	9.87	7.69	7.55	7.58	8.96	9.80	7.69	5.93	6.28
Pr	1.49	1.59	1.33	1.40	1.33	1.36	1.42	1.15	1.12	1.12	1.26	1.38	1.13	0.93	0.92
Nd	7.64	8.05	6.69	6.88	6.72	6.83	7.00	5.81	5.82	5.78	6.31	6.79	5.86	5.04	4.68
Sm	2.89	3.02	2.40	2.50	2.40	2.43	2.50	2.28	2.29	2.24	2.29	2.47	2.17	2.12	1.80
Eu	1.13	1.19	0.94	0.98	0.92	0.95	0.97	0.91	0.93	0.89	0.88	0.97	0.89	0.88	0.73
Gd	4.27	4.45	3.35	3.49	3.35	3.34	3.46	3.38	3.31	3.30	3.25	3.44	3.11	3.29	2.64
Tb	0.82	0.83	0.64	0.66	0.63	0.63	0.65	0.64	0.63	0.63	0.62	0.66	0.58	0.64	0.49
Dy	5.60	5.84	4.38	4.62	4.48	4.49	4.54	4.54	4.44	4.46	4.34	4.56	4.07	4.60	3.41
Ho	1.25	1.28	0.97	1.00	1.00	0.98	0.99	1.00	0.99	0.98	0.96	1.00	0.89	1.01	0.75
Er	3.62	3.65	2.77	2.87	2.86	2.81	2.84	2.90	2.85	2.84	2.74	2.88	2.55	2.90	2.13
Tm	0.52	0.54	0.41	0.42	0.41	0.41	0.41	0.42	0.42	0.41	0.40	0.42	0.36	0.43	0.30
Yb	3.35	3.48	2.63	2.67	2.63	2.65	2.64	2.70	2.72	2.67	2.52	2.75	2.34	2.74	1.92
Lu	0.53	0.55	0.41	0.42	0.42	0.41	0.41	0.42	0.43	0.41	0.40	0.43	0.36	0.43	0.30
Ba	54	60	61	69	68	69	71	39	43	40	93	48	48	25	32
Th	0.37	0.39	0.22	0.23	0.25	0.21	0.24	0.28	0.31	0.28	0.17	0.20	0.18	0.20	0.15
Nb	3.08	3.11	2.30	2.42	2.37	2.39	2.50	2.25	2.20	2.17	2.06	2.33	2.68	1.94	1.69
Y	33.75	34.89	25.69	26.18	26.20	25.43	26.06	26.52	25.45	25.54	25.30	26.07	23.52	27.03	19.80
Hf	1.83	1.89	1.55	1.65	1.58	1.57	1.62	1.53	1.55	1.50	1.50	1.66	1.32	1.46	1.13
Ta	0.17	0.19	0.13	0.14	0.14	0.14	0.15	0.14	0.14	0.13	0.12	0.13	0.16	0.12	0.10
U	0.06	0.06	0.05	0.05	0.05	0.05	0.06	0.05	0.10	0.05	0.04	0.05	0.04	0.05	0.04
Pb	0.54	0.55	0.73	0.71	0.78	0.68	0.76	0.60	0.69	0.60	0.60	0.70	0.47	0.39	0.42
Rb	1.8	2.8	1.6	1.0	1.5	0.8	1.2	1.6	1.2	0.9	0.8	0.4	0.3	0.7	1.6
Cs	0.02	0.02	0.03	0.01	0.03	0.01	0.01	0.02	0.02	0.01	0.01	0.01	0.01	0.00	0.02
Sr	100	104	128	137	133	137	141	103	108	104	122	130	122	84	109

Table 1 (continued).

Leg:	163	163	163	163	163
Hole:	990A	990A	990A	990A	990A
Sample:	21R-4, 84	22-R-1, 26	22R-6, 51	23R-5, 54	24R-3, 10
Original total:	100.27	100.57	100.64	101.03	100.67
LOI (%):	2.72	1.65	4.27	1.63	2.99
XRF					
SiO_2	51.46	51.38	50.93	50.79	51.45
Al_2O_3	15.39	16.44	15.29	16.76	14.82
TiO_2	0.90	0.76	0.91	0.79	0.82
FeO*	9.65	10.19	10.37	9.30	10.63
MnO	0.206	0.193	†0.24	0.200	0.199
CaO	11.92	11.24	12.03	12.60	11.90
MgO	8.06	7.68	7.81	7.18	7.92
K_2O	0.09	0.13	0.08	0.16	0.22
Na_2O	2.24	1.93	2.25	2.16	1.99
P_2O_5	0.080	0.072	0.080	0.070	0.064
XRF					
Ni	101	94	86	84	89
Cr	263	249	222	239	235
Sc	47	36	39	37	36
V	301	255	292	271	274
Ba	38	23	33	9	13
Rb	0	1	0	1	3
Sr	97	89	95	98	75
Zr	52	45	52	47	44
Y	23	21	24	20	21
Nb	3.5	1.9	2.5	1.7	2.5
Ga	15	15	14	17	15
Cu	†225	57	115	41	41
Zn	78	64	77	68	73
Pb	1	0	0	0	1
Th	0	0	1	2	0
ICP/MS					
La	3.17	2.67	3.49	2.93	2.22
Ce	6.97	5.83	7.60	6.23	5.04
Pr	1.03	0.87	1.12	0.94	0.80
Nd	5.18	4.45	5.70	4.71	4.27
Sm	1.97	1.71	2.18	1.84	1.83
Eu	0.82	0.70	0.88	0.76	0.75
Gd	2.91	2.47	3.19	2.65	2.78
Tb	0.55	0.48	0.60	0.52	0.54
Dy	3.89	3.34	4.28	3.67	3.83
Ho	0.86	0.74	0.94	0.80	0.85
Er	2.44	2.14	2.70	2.27	2.47
Tm	0.36	0.31	0.39	0.33	0.36
Yb	2.31	2.00	2.53	2.10	2.23
Lu	0.37	0.31	0.40	0.33	0.36
Ba	34	23	39	30	21
Th	0.17	0.15	0.18	0.15	0.13
Nb	1.93	1.59	2.08	1.73	1.63
Y	22.77	20.03	25.33	20.82	22.41
Hf	1.33	1.10	1.44	1.21	1.16
Ta	0.12	0.09	0.12	0.10	0.10
U	0.04	0.04	0.04	0.03	0.03
Pb	0.49	0.41	0.50	0.44	0.35
Rb	0.7	1.9	0.5	2.2	4.0
Cs	0.01	0.05	0.00	0.01	0.08
Sr	108	96	109	111	84

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Table 2. Leg 163 Sr, Nd, and O isotope ratios.

Sample	$^{87}Sr/^{86}Sr$ measured	$^{87}Sr/^{86}Sr$ corrected	Uncertainty 2 Σ mean	$^{143}Nd/^{144}Nd$ measured	Uncertainty 2 Σ mean	ε Nd present day	Δ O
988A-5R-1,15	0.70339	0.70337	0.00002	0.512869	0.000008	4.5	4.9
989B-10R-1,135	0.70297	0.70295	0.00002	0.513101	0.000014	9.0	6.8
Repeat				0.513092	0.000024	8.9	
989B-11R-2,129							6.1
990A-7R-1,43	0.70442	0.70440	0.00002	0.512582	0.000012	–1.1	6.7
Repeat				0.512582	0.000011	–1.1	
990A-9R-3,70	0.70335	0.70333	0.00002	0.512371	0.000010	–5.2	5.9
Repeat				0.512363	0.000013	–5.4	
990A-11R-2,40							6.8
990A-15R-2,62							5.6
990A-15R-5,3							5.1
990A-16R-3,128							6.2
990A-17R-4,104	0.70335	0.70333	0.00002	0.512368	0.000014	–5.3	5.1
Repeat	0.70335	0.70333	0.00002	0.512395	0.000015	–4.7	
990A-18R-6,82							6.3
990A-19R-5,70							7.5
990A-20R-4,1							6.1
990A-21R-4,89							5.4
990A-22R-1,53	0.70351	0.70349	0.00002	0.512564	0.000012	–1.4	5.3
Repeat				0.512551	0.000010	–1.7	
990A-22R-3,61							6.3
990A-22R-6,15							5.6
990A-23R-4,121							6.4
990A-24R-3,56							5.7