BRITISH GEOLOGICAL SURVEY
Natural Environment Research Council

TECHNICAL REPORT

Hydrogeology Series

Report WD/88/18R

KENYA RIFT VALLEY GEOTHERMAL PROJECT PHASE II
Report on a visit 13 September-8 October 1988

W G Darling
D J Allen

A report prepared for the Overseas Development Administration

Keyworth, Nottinghamshire British Geological Survey 1988

CONTENTS

1. INTRODUCTION AND PURPOSE OF VISIT

This report describes the first hydrogeological visit in connection with the second phase of the UK-Kenya Rift Valley Geothermal Project. The visit was undertaken by W G Darling and D J Allen and was essentially a hydrogeochemical sampling exercise, with the aim of establishing the characteristic fluid chemistry of the accessible thermal areas located so far, and of cold groundwater.

2. ITINERARY

12 September	Depart LHR
13 September	Arrive Nairobi. Prepare sampling equipment. Visit BHC.
14 September	Prepare and load sampling equipment. Travel to Lake Baringo.
15 September	Sampling fumarole, site 162 (Loruk).
16 September	Sampling fumaroles, sites 159, 160, 161 (Nakapron). Sampling borehole, site 132.
17 September	Sampling fumaroles, sites 155, 157 (Chepchok).
18 September	Sampling rivers and streams around Lake Baringo, sites 141, 142, 147.
19 September	Sampling fumarole and thermal springs on Ol Kokwe island, sites 71, 152.
20 September	Sampling thermal spring by Lake Bogoria. Collecting supplies from Nakuru.
21 September	Sampling fumarole, site 156 (Chepchok). Sampling borehole, site 133 (Tangulbei).
22 September	Sampling fumaroles in Paka Crater, sites 163, 164, 165.
23 September	Sampling thermal spring at Lorusio, site 45. Sampling rivers, sites 148, 149.
24 September	Attempted to sample Kapedo springs. Prevented by flooded river.
25 September	Sampling fumaroles on Korosi, sites 153, 154.
26 September	Collecting supplies from Nakuru. Visit to Menengai Crater.
27 September	Sampling fumarole, site 158 (Kinyat). Sampling Lake Tilam and reservoir, site 151.
28 September	Sampling fumaroles on Paka, sites 166, 167.

29 September	Sampling Kapedo thermal springs, sites 48, 50. Sampling thermal spring, site 138 and river, site 148.
30 September	Sampling rivers to E and S of Lake Baringo, sites 143-146. Sampling thermal spring at Ebirisat, site 140.
1 October	Sampling fumaroles in Paka explosion crater, sites 168-171.
2 October	-
3 October	Re-sampling of Loruk fumarole, site 162.
4 October	Sampling thermal spring at Churo, site 139. Sampling boreholes to E of Paka, sites 134-137.
5 October	Packing equipment. Return to Nairobi.
6 October	Packing samples.
7 October	Packing samples, collecting site details.
8 October	Leave Nairobi.

3. PROGRESS

The purpose of this visit was to carry out geochemical sampling of water and steam in the southern half of the Rift Valley Geothermal Project, Phase 2 area.

Despite some unseasonally wet weather, a reasonably good coverage of the Korosi and Paka volcanoes was achieved, with most effort being devoted to fumaroles at or near local boiling point (97^{o}C). Owing to a general lack of wells only a few groundwater samples could be obtained, but surface water in perennial and strong seasonal streams was sampled to assist understanding of the water balance of Lake Baringo, which has a probable subsurface outflow through at least part of the project area. Samples were also collected from thermal and non-thermal manifestations outside the immediate project area, principally at Lake Bogoria and on the Rift flanks, to provide a general context for the results. Details of sites and samples are given in Table 1, Figures 1-3 and the Appendix to this report. Apart from basic properties (pH, temperature and electrical conductivity), all chemical and isotopic measurements of the waters and gases collected will be carried out in the UK following receipt of airfreighted samples. The results of these analyses will be discussed in a subsequent report.

During the visit, discussion of the geochemical results from RVGP Phase 1 took place with Mr G Gislason, Chief Technical Adviser to the UNDP/DTCD project.

4. SUMMARY AND FUTURE WORK

This visit was devoted to the collection of a representative suite of fluid samples from the southern part of the Phase 2 Geothermal Project area. The principal area of interest centred on the Paka and Korosi volcanoes which

have numerous geothermal manifestations, but additional samples were obtained over a substantial area, ranging from Bogoria in the south to Lorusio in the north and extending to the eastern Rift margins.

It is intended in future visits to extend the sampled area to include the less accessible volcanic centres to the north. In addition further sampling in the Paka-Korosi area may be necessary. Time will also be spent obtaining physical hydrological data relevant to the project area.

TABLE 1 - SAMPLE DETAILS

R.V.G.P. REF. NO.	GRID REF.	LOCALITY DESCRIPTION	Chem	S.I.	^{13}C	Gas	NaOH	$CdCl_2$	He
45	AM 788 387	Lorusio Spr.	✓	✓	✓	✓			✓
48a-c	AM 776 299	Kapedo Spr.	✓	✓	✓	✓			✓
50	AM 778 293	Kapedo Spr.	✓	✓					
69	AL 750 290	Bogoria Spr.	✓	✓	✓	✓			✓
71a-c	AL 7530 6925	Ol Kokwe Is. Spr.	✓	✓	✓				
131	AL 6860 6815	Kampi ya Samaki B/h	✓	✓					
132	AL 687 925	Chesirimion B/h	✓	✓	✓				
133	AL 9525 8990	Tangulbei B/h	✓	✓	✓				
134	AL 9940 9900	Kokwo Toto B/h	✓	✓	✓				
135	BM 0050 0605	Orus Mission B/h (Solar)	✓	✓	✓				
136	BM 0040 0580	Orus Mission B/h (Hand)	✓	✓	✓				
137	AL 9340 9750	Katangora B/h	✓	✓	✓				
138	AM 7695 2925	Spr, Nginyang-Kapedo Conf.	✓	✓					
139	BL 1140 8570	Churo Spr.	✓	✓	✓	✓			
140	AL 936 675	Ebirisat Spr.	✓	✓	✓				
141	ZR 324 591	R. Ndau	✓	✓					
142	ZR 305 510	R. Tigeri	✓	✓					
143	AL 661 486	R. Molo	✓	✓					
144	AL7990 5710	R. Arabel	✓	✓					
145	AL 9070 6985	R. Itwa	✓	✓					
146	AL 9660 8290	R. Kabarmel	✓	✓					
147	AL 808 721	R. Mukutan	✓	✓					
148a-c	AM 6755 0505	R. Nginyang		✓					
149	AM 6755 1025	R. Cheptopokwo	✓	✓					
150	AL 7150 6900	L. Baringo	✓	✓					
151a,b	AL 7940 9470	Tilam Lake and Dam		✓					
152	AL 7530 6925	Ol Kokwe OK1 Fum.	✓	✓		✓	✓	✓	✓
153	AL 791 869	Korosi KR10 Fum.		✓					
154	AL 792 857	Korosi KR12 Fum.	✓	✓		✓	✓		✓
155	AL 8817 9362	Korosi KR50 Fum.	✓	✓		✓	✓		
156	AL 8737 9330	Korosi KR52 Fum.	✓	✓		✓	✓		✓
157	AL 8741 9342	Korosi KR53 Fum.	✓	✓		✓	✓		
158	AL 8005 9115	Korosi KR55 Fum.	✓	✓					
159	AL 7685 8935	Korosi KR57 Fum.	✓	✓		✓			
160	AL 7694 8990	Korosi KR58 Fum.		✓					
161	AL 7685 8840	Korosi KR66 Fum.		✓					
162	AL 6790 7375	Loruk KR68 Fum.	✓	✓		✓	✓		✓
163	AM 868 016	Paka PK1a Fum.	✓	✓		✓	✓		✓
164	AM 868 017	Paka PK1b Fum.		✓					
165	AM 868 021	Paka PK1c Fum.		✓					
166	AM 8675 0355	Paka PK4a Fum.	✓	✓		✓	✓	✓	
167	AM 8675 0355	Paka PK4b Fum.	✓	✓					
168	AM 891 010	Paka PK7a Fum.	✓	✓		✓	✓	✓	✓
169	AM 885 014	Paka PK7b Fum.		✓					
170	AM 886 011	Paka PK7c Fum.		✓					
171	AM 890 012	Paka PK7d Fum.	✓	✓					

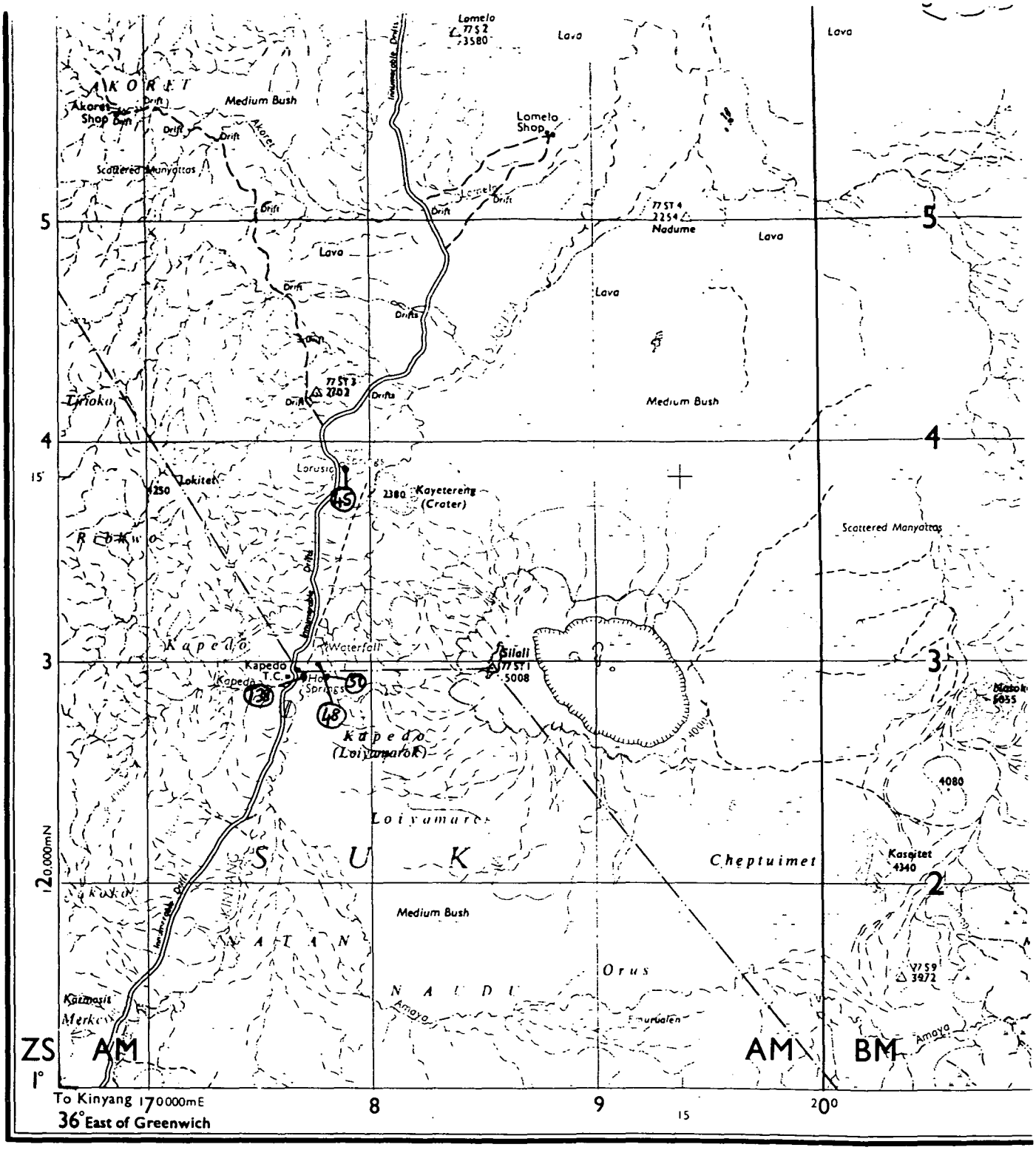


Figure 1 Sampling Sites - Silali Area

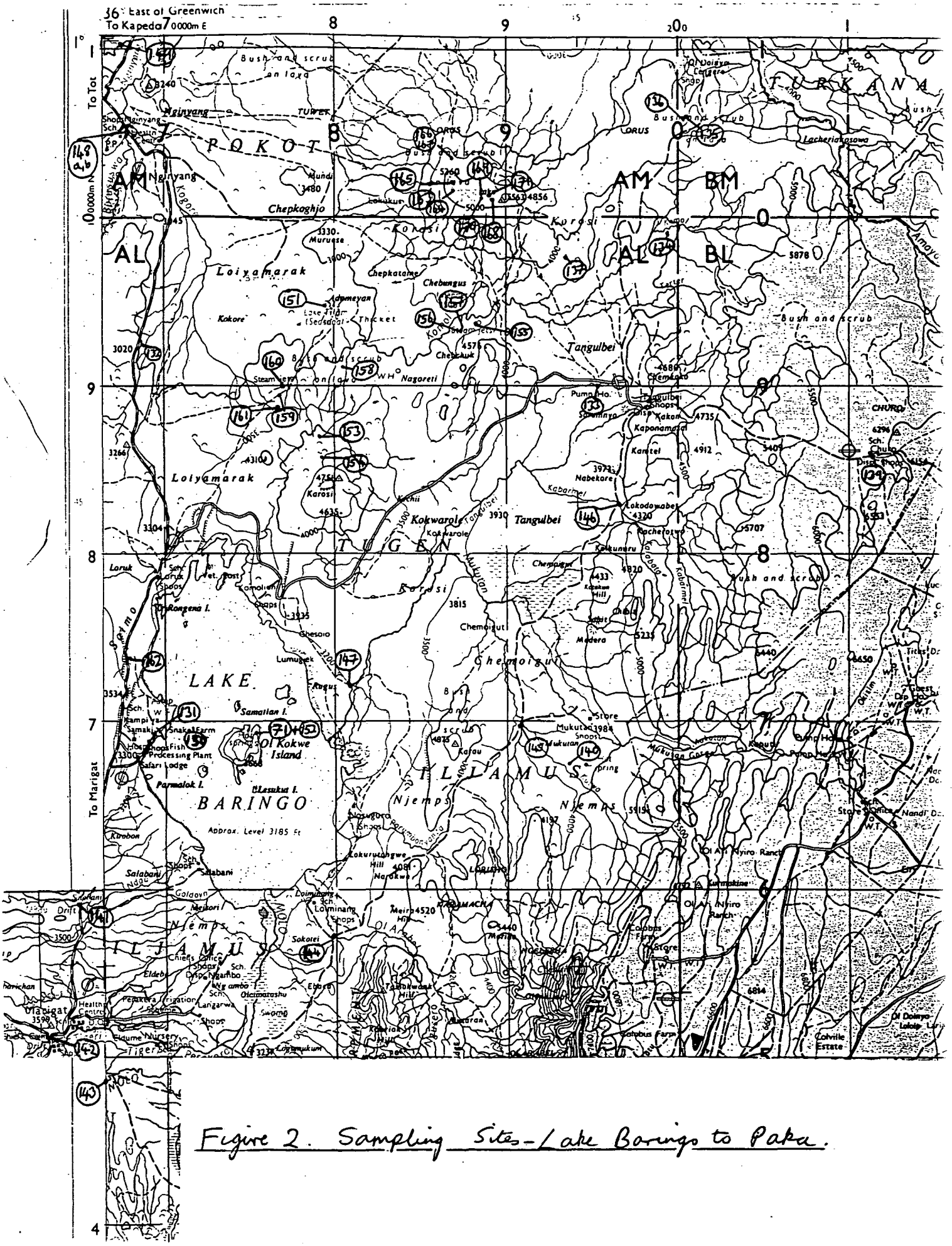


Figure 2. Sampling Sites - Lake Baringo to Paka.

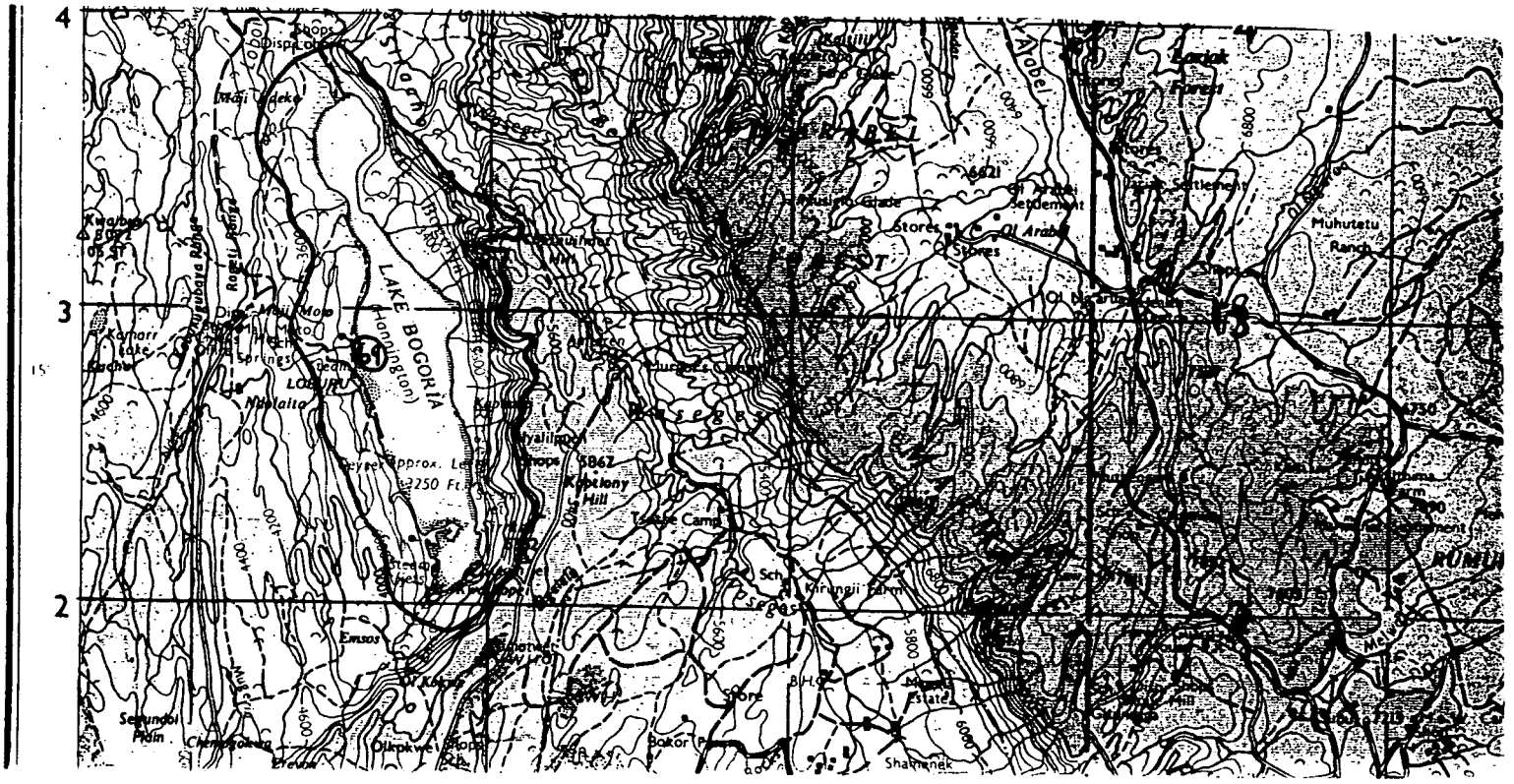


Figure 3. Sampling Site - Lake Bogoria

APPENDIX - SAMPLE DATA SHEETS

KENYA RIFT VALLEY GEOTHERMAL PROJECT

BGS/GOK, MERD DATASHEET FOR WATER SAMPLES

1. Sampled by : WGD | DJA Sample No: 45
Date : 23·9·88
Sample type: WATER, GAS
Temperature: 82.2°C

2. Place name : LORUSIO
Grid Ref. : AM 788387 1:50,000 No.: 77/1
Altitude (m):
Access notes: VEHICLE

3. Description of springs

Area of discharge — SEE PREVIOUS DESCRIPTION BY W.G. BURGESS
Number of springs
Flow rates (liters/second)
Temperature (Max)
Temperature (Range)
Conductivity (μmhos)
pH
Gas (amount and constancy)
Smell
Type of encrustation/alteration
Photograph
Notes

4. Description of streams

Approx. flow rate (liter/second)
Conductivity (μmhos)
pH
Photograph
Notes

5. Description of borehole sample

Sample depth
Discharge rate
pH
Conductivity (μmhos)
Stratigraphy/lithology
Notes

6. Descriptive notes of other samples (rainwater, lakewater)

7. Description of geological setting

Faulting (field evidence, photo interpretation)

Volcanism (age and type of associated activity)

Hydrothermal alteration (general description, ?sample)

Other notes chemistry, S.I., $\delta^{13}C$, gases and He sampled

KENYA RIFT VALLEY GEOTHERMAL PROJECT

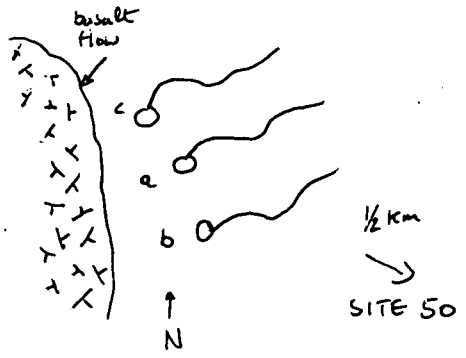
BGS/GOK, MERD DATASHEET FOR WATER SAMPLES

1. Sampled by : WGD /DJA Sample No: 48 a - c
   Date : 29·9·88
   Sample type: WATER
   Temperature: 50·7°c

2. Place name : KAPEDO
   Grid Ref. : AM776294 1:50,000 No.: 77/3
   Altitude (m):
   Access notes: FOOT, 1 Km, RIVER CROSSING

3. Description of springs

   Area of discharge — SEE PREVIOUS DESCRIPTION BY WG BURGESS
   Number of springs
   Flow rates (liters/second)
   Temperature (Max)
   Temperature (Range)
   Conductivity (μmhos)
   pH (a) 8·25 (b) 8·35 (c) 8·35
   Gas (amount and constancy)
   Smell
   Type of encrustation/alteration
   Photograph
   Notes



4. Description of streams

   Approx. flow rate (liter/second)
   Conductivity (μmhos)
   pH
   Photograph
   Notes

5. Description of borehole sample

   Sample depth
   Discharge rate
   pH
   Conductivity (μmhos)
   Stratigraphy/lithology
   Notes

6. Descriptive notes of other samples (rainwater, lakewater)

7. Description of geological setting

   Faulting (field evidence, photo interpretation)

   Volcanism (age and type of associated activity)

   Hydrothermal alteration (general description, ?sample)

   Other notes chemistry, S.I., $\delta^{13}C$, gases and He collected (a)
   (b) and (c) S.I. only

KENYA RIFT VALLEY GEOTHERMAL PROJECT

BGS/GOK, MERD DATASHEET FOR WATER SAMPLES

1. Sampled by : WGD/DJA Sample No: 50
Date : 29·9·88
Sample type: WATER
Temperature: 27°C

2. Place name : KAPEDO
Grid Ref. : AM 778293 1:50,000 No.: 77/3
Altitude (m):
Access notes: FOOT, 1 km, RIVER CROSSING

3. Description of springs

SEE PREVIOUS DESRIPTION BY WG BURGESS

Area of discharge
Number of springs
Flow rates (liters/second)
Temperature (Max)
Temperature (Range)
Conductivity (μmhos)
pH 8·50
Gas (amount and constancy)
Smell
Type of encrustation/alteration
Photograph
Notes

4. Description of streams

Approx. flow rate (liter/second)
Conductivity (μmhos)
pH
Photograph
Notes

..../2.

5. Description of borehole sample

Sample depth
Discharge rate
pH
Conductivity (μmhos)
Stratigraphy/lithology
Notes

6. Descriptive notes of other samples (rainwater, lakewater)

7. Description of geological setting

Faulting (field evidence, photo interpretation)

Volcanism (age and type of associated activity)

Hydrothermal alteration (general description, ?sample)

Other notes chemistry and S.I. samples collected

KENYA RIFT VALLEY GEOTHERMAL PROJECT

BGS/GOK, MERD DATASHEET FOR WATER SAMPLES

1. Sampled by : WGD/DJA Sample No: 69
Date : 20/9/88
Sample type: WATER, GAS
Temperature: 96°c

2. Place name : BOGORIA
Grid Ref. : AL 750290 1:50,000 No.:
Altitude (m):
Access notes: VEHICLE

3. Description of springs

Area of discharge SEE PREVIOUS DESCRIPTION BY W.G. BURGESS
Number of springs
Flow rates (liters/second)
Temperature (Max)
Temperature (Range)
Conductivity (μmhos)
pH
Gas (amount and constancy)
Smell
Type of encrustation/alteration
Photograph
Notes

4. Description of streams

Approx. flow rate (liter/second)
Conductivity (μmhos)
pH
Photograph
Notes

5. Description of borehole sample

Sample depth
Discharge rate
pH
Conductivity (μmhos)
Stratigraphy/lithology
Notes

6. Descriptive notes of other samples (rainwater, lakewater)

7. Description of geological setting

Faulting (field evidence, photo interpretation)

Volcanism (age and type of associated activity)

Hydrothermal alteration (general description, ?sample)

Other notes chemistry, S.I, $\delta^{13}C$, gases and He samples collected.

KENYA RIFT VALLEY GEOTHERMAL PROJECT

BGS/GOK, MERD DATASHEET FOR WATER SAMPLES

1. Sampled by : WGD / DJA Sample No: 71 a - c
   Date : 19·9·88
   Sample type: WATER
   Temperature: 95·8°c

2. Place name : OL KOKWE ISLAND
   Grid Ref. : AL 7530 6925 a,b 1:50,000 No.: 91/3
   Altitude (m): 7490 6935 c
   Access notes: BOAT

3. Description of springs

   Area of discharge — SEE PREVIOUS DESCRIPTION BY WG. BURGESS
   Number of springs
   Flow rates (liters/second)
   Temperature (Max)
   Temperature (Range)
   Conductivity (μmhos)
   pH (a) 6·90 (b) 9·05 (c) 6·40
   Gas (amount and constancy)
   Smell
   Type of encrustation/alteration
   Photograph
   Notes

4. Description of streams

   Approx. flow rate (liter/second)
   Conductivity (μmhos)
   pH
   Photograph
   Notes

5. Description of borehole sample

   Sample depth
   Discharge rate
   pH
   Conductivity (μmhos)
   Stratigraphy/lithology
   Notes

6. Descriptive notes of other samples (rainwater, lakewater)

7. Description of geological setting

   Faulting (field evidence, photo interpretation)

   Volcanism (age and type of associated activity)

   Hydrothermal alteration (general description, ?sample)

   Other notes Sampled for :
   (a) chemistry, S.I., $\delta^{13}C$
   (b)&(c) chemistry, S.I.

KENYA RIFT VALLEY GEOTHERMAL PROJECT

BGS/GOK, MERD DATASHEET FOR WATER SAMPLES

1. Sampled by : WRD Sample No: 131
   Date : 25.9.88
   Sample type: WATER
   Temperature:

2. Place name : KAMPI YA SAMAKI
   Grid Ref. : AL 68606815 1:50,000 No.: 91/3
   Altitude (m):
   Access notes:

3. Description of springs

   Area of discharge
   Number of springs
   Flow rates (liters/second)
   Temperature (Max)
   Temperature (Range)
   Conductivity (μmhos)
   pH
   Gas (amount and constancy)
   Smell
   Type of encrustation/alteration
   Photograph
   Notes

4. Description of streams

   Approx. flow rate (liter/second)
   Conductivity (μmhos)
   pH
   Photograph
   Notes

5. Description of borehole sample

   Sample depth
   Discharge rate
   pH 7.70
   Conductivity (μmhos) 969
   Stratigraphy/lithology
   Notes camp water supply from shallow well near L. Baringo

6. Descriptive notes of other samples (rainwater, lakewater)

7. Description of geological setting

   Faulting (field evidence, photo interpretation)

   Volcanism (age and type of associated activity)

   Hydrothermal alteration (general description, ?sample)

   Other notes chemistry and S.I. sampled.

KENYA RIFT VALLEY GEOTHERMAL PROJECT

BGS/GOK, MERD DATASHEET FOR WATER SAMPLES

1. Sampled by : WGD/DJA Sample No: 132
   Date : 16·9·88
   Sample type: WATER
   Temperature:

2. Place name : CHESIRIMION
   Grid Ref. : AL 0687 0925 1:50,000 No.: 91/1
   Altitude (m):
   Access notes: VEHICLE

3. Description of springs

   Area of discharge
   Number of springs
   Flow rates (liters/second)
   Temperature (Max)
   Temperature (Range)
   Conductivity (μmhos)
   pH
   Gas (amount and constancy)
   Smell
   Type of encrustation/alteration
   Photograph
   Notes

4. Description of streams

   Approx. flow rate (liter/second)
   Conductivity (μmhos)
   pH
   Photograph
   Notes

5. Description of borehole sample

   Sample depth
   Discharge rate
   pH 7·20
   Conductivity (μmhos) 338
   Stratigraphy/lithology
   Notes

6. Descriptive notes of other samples (rainwater, lakewater)

7. Description of geological setting

   Faulting (field evidence, photo interpretation)

   Volcanism (age and type of associated activity)

   Hydrothermal alteration (general description, ?sample)

   Other notes chemistry, S.I. and $\delta^{13}C$ taken

KENYA RIFT VALLEY GEOTHERMAL PROJECT

BGS/GOK, MERD DATASHEET FOR WATER SAMPLES

1. Sampled by : WGD/DJA Sample No: 133
   Date : 21/9/88
   Sample type: WATER
   Temperature: 30.2°c

2. Place name : TANGULBEI
   Grid Ref. : AL 9525 8990 1:50,000 No.: 91/2
   Altitude (m):
   Access notes: VEHICLE

3. Description of springs

   Area of discharge
   Number of springs
   Flow rates (liters/second)
   Temperature (Max)
   Temperature (Range)
   Conductivity (μmhos)
   pH
   Gas (amount and constancy)
   Smell
   Type of encrustation/alteration
   Photograph
   Notes

4. Description of streams

   Approx. flow rate (liter/second)
   Conductivity (μmhos)
   pH
   Photograph
   Notes

5. Description of borehole sample

   Sample depth
   Discharge rate
   pH 7.70
   Conductivity (μmhos) 772
   Stratigraphy/lithology
   Notes PISTON PUMP

6. Descriptive notes of other samples (rainwater, lakewater)

7. Description of geological setting

   Faulting (field evidence, photo interpretation)

   Volcanism (age and type of associated activity)

   Hydrothermal alteration (general description, ?sample)

   Other notes chemistry, S.I. and $\delta^{13}C$ sampled

..../2.

KENYA RIFT VALLEY GEOTHERMAL PROJECT

BGS/GOK, MERD DATASHEET FOR WATER SAMPLES

1. Sampled by : WGO/DJA Sample No: 134
   Date : 4·10·88
   Sample type: WATER
   Temperature: 28°c

2. Place name : KOKWO TOTO
   Grid Ref. AL 1940 9900 1:50,000 No.: 91/2.
   Altitude (m):
   Access notes: VEHICLE

3. Description of springs

   Area of discharge
   Number of springs
   Flow rates (liters/second)
   Temperature (Max)
   Temperature (Range)
   Conductivity (μmhos)
   pH
   Gas (amount and constancy)
   Smell
   Type of encrustation/alteration
   Photograph
   Notes

4. Description of streams

   Approx. flow rate (liter/second)
   Conductivity (μmhos)
   pH
   Photograph
   Notes

5. Description of borehole sample

   Sample depth
   Discharge rate
   pH 7·05
   Conductivity (μmhos) 668
   Stratigraphy/lithology
   Notes ELECTRIC SUBMERSIBLE PUMP

6. Descriptive notes of other samples (rainwater, lakewater)

7. Description of geological setting

   Faulting (field evidence, photo interpretation)

   Volcanism (age and type of associated activity)

   Hydrothermal alteration (general description, ?sample)

   Other notes chemistry, S.I. and $\delta^{13}C$ collected

..../2.

KENYA RIFT VALLEY GEOTHERMAL PROJECT

BGS/GOK, MERD DATASHEET FOR WATER SAMPLES

1. Sampled by : WGO/DJA Sample No: 135
   Date : 4·10·88
   Sample type: WATER
   Temperature: 28°C

2. Place name : ORUS MISSION
   Grid Ref. : BM 0050 0605 1:50,000 No.: 91/2.
   Altitude (m):
   Access notes: VEHICLE

3. Description of springs

   Area of discharge
   Number of springs
   Flow rates (liters/second)
   Temperature (Max)
   Temperature (Range)
   Conductivity (μmhos)
   pH
   Gas (amount and constancy)
   Smell
   Type of encrustation/alteration
   Photograph
   Notes

4. Description of streams

   Approx. flow rate (liter/second)
   Conductivity (μmhos)
   pH
   Photograph
   Notes

5. Description of borehole sample

   Sample depth
   Discharge rate
   pH 7·00
   Conductivity (μmhos) 772
   Stratigraphy/lithology
   Notes SOLAR-POWERED PUMP, DEEPER WELL

6. Descriptive notes of other samples (rainwater, lakewater)

7. Description of geological setting

   Faulting (field evidence, photo interpretation)

   Volcanism (age and type of associated activity)

   Hydrothermal alteration (general description, ?sample)

   Other notes chemistry, S.I. and $\delta^{13}C$ collected.

..../2.

KENYA RIFT VALLEY GEOTHERMAL PROJECT

BGS/GOK, MERD DATASHEET FOR WATER SAMPLES

1. Sampled by : WGD/DJA Sample No: 136
   Date : 4.10.88
   Sample type: WATER
   Temperature: ~ 28°C

2. Place name : ORUS MISSION
   Grid Ref. : 0M0040 0580 1:50,000 No.: 9/2.
   Altitude (m):
   Access notes: VEHICLE

3. Description of springs

   Area of discharge
   Number of springs
   Flow rates (liters/second)
   Temperature (Max)
   Temperature (Range)
   Conductivity (μmhos)
   pH
   Gas (amount and constancy)
   Smell
   Type of encrustation/alteration
   Photograph
   Notes

4. Description of streams

   Approx. flow rate (liter/second)
   Conductivity (μmhos)
   pH
   Photograph
   Notes

5. Description of borehole sample

   Sample depth
   Discharge rate
   pH 6.45
   Conductivity (μmhos) 322
   Stratigraphy/lithology
   Notes HAND-PUMPED, SHALLOW AQUIFER

6. Descriptive notes of other samples (rainwater, lakewater)

7. Description of geological setting

   Faulting (field evidence, photo interpretation)

   Volcanism (age and type of associated activity)

   Hydrothermal alteration (general description, ?sample)

   Other notes chemistry, S.I. and $\delta^{13}C$ collected

..../2.

KENYA RIFT VALLEY GEOTHERMAL PROJECT

BGS/GOK, MERD DATASHEET FOR WATER SAMPLES

1. Sampled by : WGD/OJA Sample No: 137
   Date : 4.10.88
   Sample type: WATER
   Temperature: >35°c

2. Place name : KATANGORA
   Grid Ref. : AL 9340 9750 1:50,000 No.: 91/1
   Altitude (m):
   Access notes: VEHICLE

3. Description of springs

   Area of discharge
   Number of springs
   Flow rates (liters/second)
   Temperature (Max)
   Temperature (Range)
   Conductivity (μmhos)
   pH
   Gas (amount and constancy)
   Smell
   Type of encrustation/alteration
   Photograph
   Notes

4. Description of streams

   Approx. flow rate (liter/second)
   Conductivity (μmhos)
   pH
   Photograph
   Notes

5. Description of borehole sample

   Sample depth
   Discharge rate
   pH 8.30
   Conductivity (μmhos) 585
   Stratigraphy/lithology
   Notes STANDING WATER - SURFACE SAMPLE
   NO PUMP INSTALLED

6. Descriptive notes of other samples (rainwater, lakewater)

7. Description of geological setting

   Faulting (field evidence, photo interpretation)

   Volcanism (age and type of associated activity)

   Hydrothermal alteration (general description, ?sample)

   Other notes chemistry, S.I. and $\delta^{13}C$ collected

KENYA RIFT VALLEY GEOTHERMAL PROJECT

BGS/GOK, MERD DATASHEET FOR WATER SAMPLES

1. Sampled by : WD/DOA Sample No: 138
   Date : 29/9/88
   Sample type: WATER
   Temperature: SLIGHTLY ABOVE AMBIENT

2. Place name : NGINYANG-KAPEDO CONFLUENCE
   Grid Ref. : AM 7695 2925 1:50,000 No.: 77/3
   Altitude (m):
   Access notes: VEHICLE

3. Description of springs

   Area of discharge
   Number of springs 2 small springs flowing into Kapedo. Spring furthest from Nginyang sampled
   Flow rates (liters/second) 0.2 l/s.
   Temperature (Max) 36°C
   Temperature (Range)
   Conductivity (µmhos) 2972
   pH 8.30
   Gas (amount and constancy)
   Smell
   Type of encrustation/alteration
   Photograph
   Notes

4. Description of streams

   Approx. flow rate (liter/second)
   Conductivity (µmhos)
   pH
   Photograph
   Notes

5. Description of borehole sample

   Sample depth
   Discharge rate
   pH
   Conductivity (µmhos)
   Stratigraphy/lithology
   Notes

6. Descriptive notes of other samples (rainwater, lakewater)

7. Description of geological setting

   Faulting (field evidence, photo interpretation)

   Volcanism (age and type of associated activity)

   Hydrothermal alteration (general description, ?sample)

   Other notes chemistry and SI collected

KENYA RIFT VALLEY GEOTHERMAL PROJECT

BGS/GOK, MERD DATASHEET FOR WATER SAMPLES

1. Sampled by : NOD/OJA Sample No: 139
   Date : 4.10.88
   Sample type: WATER
   Temperature: 28°C

2. Place name : CHURO
   Grid Ref. : BL 1140 8570 1:50,000 No.: 91/2
   Altitude (m):
   Access notes: VEHICLE

3. Description of springs

   Area of discharge warm spring entering pool with cold stream flowing through.
   Number of springs TOTAL flow ~40 l/s. Spring flow into pool < 5 l/s.
   Flow rates (liters/second)
   Temperature (Max) ~28 l/s (Base of Pool)
   Temperature (Range)
   Conductivity (μmhos) 438
   pH 7.20
   Gas (amount and constancy) fairly constant bubbling
   Smell
   Type of encrustation/alteration
   Photograph
   Notes turbid water

4. Description of streams

   Approx. flow rate (liter/second)
   Conductivity (μmhos)
   pH
   Photograph
   Notes

5. Description of borehole sample

   Sample depth
   Discharge rate
   pH
   Conductivity (μmhos)
   Stratigraphy/lithology
   Notes

6. Descriptive notes of other samples (rainwater, lakewater)

7. Description of geological setting

   Faulting (field evidence, photo interpretation)

   Volcanism (age and type of associated activity)

   Hydrothermal alteration (general description, ?sample)

   Other notes chemistry, S.I., $\delta^{13}C$ and gases sampled

KENYA RIFT VALLEY GEOTHERMAL PROJECT

BGS/GOK, MERD DATASHEET FOR WATER SAMPLES

1. Sampled by : WRD/DOA Sample No: 140
   Date : 30/9/88
   Sample type: WATER
   Temperature: 37·5°C

2. Place name : EBIRISAT
   Grid Ref. : AL 936 675 1:50,000 No.: 91/3
   Altitude (m):
   Access notes: VEHICLE

3. Description of springs

   Area of discharge Area of reeded wet ground c 200m diam with numerous warm
   Number of springs seepages. some dome springs. Pool fed by seep sampled.
   Flow rates (liters/second)
   Temperature (Max) 37·5°C
   Temperature (Range)
   Conductivity (µmhos) 601
   pH 9·00
   Gas (amount and constancy)
   Smell
   Type of encrustation/alteration
   Photograph
   Notes

4. Description of streams

   Approx. flow rate (liter/second)
   Conductivity (µmhos)
   pH
   Photograph
   Notes

5. Description of borehole sample

   Sample depth
   Discharge rate
   pH
   Conductivity (µmhos)
   Stratigraphy/lithology
   Notes

6. Descriptive notes of other samples (rainwater, lakewater)

7. Description of geological setting

   Faulting (field evidence, photo interpretation)

   Volcanism (age and type of associated activity)

   Hydrothermal alteration (general description, ?sample)

   Other notes chemistry, S.I. and $\delta^{13}C$ taken

KENYA RIFT VALLEY GEOTHERMAL PROJECT

BGS/GOK, MERD DATASHEET FOR WATER SAMPLES

1. Sampled by : WGD/DJA Sample No: 141
   Date : 18·9·88
   Sample type: WATER
   Temperature: ~20°c

2. Place name : R.NDAU
   Grid Ref. : ZR 324 591 1:50,000 No.: 90/4
   Altitude (m):
   Access notes: VEHICLE

3. Description of springs

   Area of discharge
   Number of springs
   Flow rates (liters/second)
   Temperature (Max)
   Temperature (Range)
   Conductivity (μmhos)
   pH
   Gas (amount and constancy)
   Smell
   Type of encrustation/alteration
   Photograph
   Notes

4. Description of streams

   Approx. flow rate (liter/second) 2 m³/s (seasonal)
   Conductivity (μmhos) 201
   pH 8·85
   Photograph
   Notes FAIRLY CLEAR

5. Description of borehole sample

   Sample depth
   Discharge rate
   pH
   Conductivity (μmhos)
   Stratigraphy/lithology
   Notes

6. Descriptive notes of other samples (rainwater, lakewater)

7. Description of geological setting

   Faulting (field evidence, photo interpretation)

   Volcanism (age and type of associated activity)

   Hydrothermal alteration (general description, ?sample)

   Other notes chemistry and S I samples taken

KENYA RIFT VALLEY GEOTHERMAL PROJECT

BGS/GOK, MERD DATASHEET FOR WATER SAMPLES

1. Sampled by : WGD/DJA Sample No: 142
   Date :
   Sample type: WATER
   Temperature: AMBIENT

2. Place name : R. TIGERI
   Grid Ref. : ZR 305510 1:50,000 No.: 104/2.
   Altitude (m):
   Access notes: VEHICLE

3. Description of springs

   Area of discharge
   Number of springs
   Flow rates (liters/second)
   Temperature (Max)
   Temperature (Range)
   Conductivity (μmhos)
   pH
   Gas (amount and constancy)
   Smell
   Type of encrustation/alteration
   Photograph
   Notes

4. Description of streams

   Approx. flow rate (liter/second) River >10 m3/s
   Conductivity (μmhos) 82
   pH 7.65
   Photograph
   Notes MUDDY

5. Description of borehole sample

   Sample depth
   Discharge rate
   pH
   Conductivity (μmhos)
   Stratigraphy/lithology
   Notes

6. Descriptive notes of other samples (rainwater, lakewater)

7. Description of geological setting

   Faulting (field evidence, photo interpretation)

   Volcanism (age and type of associated activity)

   Hydrothermal alteration (general description, ?sample)

   Other notes chemistry + SI samples taken

..../2.

KENYA RIFT VALLEY GEOTHERMAL PROJECT

BGS/GOK, MERD DATASHEET FOR WATER SAMPLES

1. Sampled by : WRD/DSA Sample No: 143
   Date : 30.9.88
   Sample type: WATER
   Temperature: AMBIENT

2. Place name : R.MOLO
   Grid Ref. : AL661486 1:50,000 No.: 105/1
   Altitude (m):
   Access notes: VEHICLE

3. Description of springs

   Area of discharge
   Number of springs
   Flow rates (liters/second)
   Temperature (Max)
   Temperature (Range)
   Conductivity (μmhos)
   pH
   Gas (amount and constancy)
   Smell
   Type of encrustation/alteration
   Photograph
   Notes

4. Description of streams

   Approx. flow rate (liter/second) ≈40 M³/S River in flood.
   Conductivity (μmhos) 99
   pH 7.75
   Photograph
   Notes VERY MUDDY

5. Description of borehole sample

   Sample depth
   Discharge rate
   pH
   Conductivity (μmhos)
   Stratigraphy/lithology
   Notes

6. Descriptive notes of other samples (rainwater, lakewater)

7. Description of geological setting

   Faulting (field evidence, photo interpretation)

   Volcanism (age and type of associated activity)

   Hydrothermal alteration (general description, ?sample)

   Other notes chemistry + S.I. sampled

..../2.

KENYA RIFT VALLEY GEOTHERMAL PROJECT

BGS/GOK, MERD DATASHEET FOR WATER SAMPLES

1. Sampled by : WGD/DJA Sample No: 144
   Date : 30.9.88
   Sample type: WATER
   Temperature: AMBIENT

2. Place name : R. ARABEL
   Grid Ref. : AL 7990 5710 1:50,000 No.: 91/3
   Altitude (m):
   Access notes: VEHICLE

3. Description of springs

   Area of discharge
   Number of springs
   Flow rates (liters/second)
   Temperature (Max)
   Temperature (Range)
   Conductivity (μmhos)
   pH
   Gas (amount and constancy)
   Smell
   Type of encrustation/alteration
   Photograph
   Notes

4. Description of streams

   Approx. flow rate (liter/second) 3 M3/S
   Conductivity (μmhos) 228
   pH 8.55
   Photograph
   Notes FAIRLY CLEAR

5. Description of borehole sample

   Sample depth
   Discharge rate
   pH
   Conductivity (μmhos)
   Stratigraphy/lithology
   Notes

6. Descriptive notes of other samples (rainwater, lakewater)

7. Description of geological setting

   Faulting (field evidence, photo interpretation)

   Volcanism (age and type of associated activity)

   Hydrothermal alteration (general description, ?sample)

   Other notes chemistry + S.I. samples collected

KENYA RIFT VALLEY GEOTHERMAL PROJECT

BGS/GOK, MERD DATASHEET FOR WATER SAMPLES

1. Sampled by : WGD/DJA Sample No: 145
   Date : 30.9.88
   Sample type: WATER
   Temperature: AMBIENT

2. Place name : R. ITWA
   Grid Ref. : AL907069 85 1:50,000 No.: 91/3
   Altitude (m):
   Access notes: VEHICLE

3. Description of springs

   Area of discharge
   Number of springs
   Flow rates (liters/second)
   Temperature (Max)
   Temperature (Range)
   Conductivity (μmhos)
   pH
   Gas (amount and constancy)
   Smell
   Type of encrustation/alteration
   Photograph
   Notes

4. Description of streams

   Approx. flow rate (liter/second) $0.1\ m^3/s$
   Conductivity (μmhos) 361
   pH 8.60
   Photograph
   Notes QUITE CLEAR

5. Description of borehole sample

   Sample depth
   Discharge rate
   pH
   Conductivity (μmhos)
   Stratigraphy/lithology
   Notes

6. Descriptive notes of other samples (rainwater, lakewater)

7. Description of geological setting

   Faulting (field evidence, photo interpretation)

   Volcanism (age and type of associated activity)

   Hydrothermal alteration (general description, ?sample)

   Other notes chemistry + isotopes sampled

..../2.

KENYA RIFT VALLEY GEOTHERMAL PROJECT

BGS/GOK, MERD DATASHEET FOR WATER SAMPLES

1. Sampled by : WGD/DJA Sample No: 146
   Date : 20.9.88
   Sample type: WATER
   Temperature: AMBIENT

2. Place name : R. KAB. 2MEL
   Grid Ref. : AL 9660 8240 1:50,000 No.: 91/4
   Altitude (m):
   Access notes: VEHICLE

3. Description of springs

   Area of discharge
   Number of springs
   Flow rates (liters/second)
   Temperature (Max)
   Temperature (Range)
   Conductivity (μmhos)
   pH
   Gas (amount and constancy)
   Smell
   Type of encrustation/alteration
   Photograph
   Notes

4. Description of streams

   Approx. flow rate (liter/second) 0.1 m^3/s
   Conductivity (μmhos) 272
   pH 8.05
   Photograph
   Notes FAIRLY CLEAR

5. Description of borehole sample

   Sample depth
   Discharge rate
   pH
   Conductivity (μmhos)
   Stratigraphy/lithology
   Notes

6. Descriptive notes of other samples (rainwater, lakewater)

7. Description of geological setting

   Faulting (field evidence, photo interpretation)

   Volcanism (age and type of associated activity)

   Hydrothermal alteration (general description, ?sample)

   Other notes chemistry + S.I. samples taken

KENYA RIFT VALLEY GEOTHERMAL PROJECT

BGS/GOK, MERD DATASHEET FOR WATER SAMPLES

1. Sampled by : PND/TKB Sample No: 147
   Date : 18.9.88
   Sample type: WATER
   Temperature: AMBIENT

2. Place name : R. MUKUTAN
   Grid Ref. : AL 808721 1:50,000 No.: 91/3.
   Altitude (m):
   Access notes: VEHICLE

3. Description of springs

   Area of discharge
   Number of springs
   Flow rates (liters/second)
   Temperature (Max)
   Temperature (Range)
   Conductivity (μmhos)
   pH
   Gas (amount and constancy)
   Smell
   Type of encrustation/alteration
   Photograph
   Notes

4. Description of streams

   Approx. flow rate (liter/second)
   Conductivity (μmhos) 357
   pH 8.15
   Photograph
   Notes TURBID . seasonal river

5. Description of borehole sample

   Sample depth
   Discharge rate
   pH
   Conductivity (μmhos)
   Stratigraphy/lithology
   Notes

6. Descriptive notes of other samples (rainwater, lakewater)

7. Description of geological setting

   Faulting (field evidence, photo interpretation)

   Volcanism (age and type of associated activity)

   Hydrothermal alteration (general description, ?sample)

   Other notes chemistry and SI samples collected

KENYA RIFT VALLEY GEOTHERMAL PROJECT

BGS/GOK, MERD DATASHEET FOR WATER SAMPLES

1. Sampled by : WGD/DJA Sample No: 148
   Date : 23·9 (a), 24·9 (b) and 29·9 (c)·88
   Sample type: WATER
   Temperature: AMBIENT

2. Place name : R.NGINYANG
   Grid Ref. : AM 6755 0505 (23+24/9) 1:50,000 No.: 77/3c
   Altitude (m): AM 7700 2875 (29/9) 91/1a,b.
   Access notes: VEHICLE

3. Description of springs

   Area of discharge
   Number of springs
   Flow rates (liters/second)
   Temperature (Max)
   Temperature (Range)
   Conductivity (μmhos)
   pH
   Gas (amount and constancy)
   Smell
   Type of encrustation/alteration
   Photograph
   Notes

4. Description of streams

   Approx. flow rate (liter/second) 710 m³/s
   Conductivity (μmhos) (a) 211
   pH (a) 8·15 (b) 8·10 (c) 8·45
   Photograph
   Notes VERY MUDDY

5. Description of borehole sample

   Sample depth
   Discharge rate
   pH
   Conductivity (μmhos)
   Stratigraphy/lithology
   Notes

6. Descriptive notes of other samples (rainwater, lakewater)

7. Description of geological setting

   Faulting (field evidence, photo interpretation)

   Volcanism (age and type of associated activity)

   Hydrothermal alteration (general description, ?sample)

   Other notes stable isotope samples only

KENYA RIFT VALLEY GEOTHERMAL PROJECT

BGS/GOK, MERD DATASHEET FOR WATER SAMPLES

1. Sampled by : WRD/OJA Sample No: 149
   Date : 23.9.88
   Sample type: WATER
   Temperature: AMBIENT

2. Place name : R. CHEPTOPOKWO
   Grid Ref. : AM 6755 1025 1:50,000 No.: 91/1
   Altitude (m):
   Access notes: VEHICLE

3. Description of springs

   Area of discharge
   Number of springs
   Flow rates (liters/second)
   Temperature (Max)
   Temperature (Range)
   Conductivity (μmhos)
   pH
   Gas (amount and constancy)
   Smell
   Type of encrustation/alteration
   Photograph
   Notes

4. Description of streams

   Approx. flow rate (liter/second) 0.5 M³/S
   Conductivity (μmhos) 177
   pH 7.95
   Photograph
   Notes FAIRLY CLEAR

5. Description of borehole sample

   Sample depth
   Discharge rate
   pH
   Conductivity (μmhos)
   Stratigraphy/lithology
   Notes

6. Descriptive notes of other samples (rainwater, lakewater)

7. Description of geological setting

   Faulting (field evidence, photo interpretation)

   Volcanism (age and type of associated activity)

   Hydrothermal alteration (general description, ?sample)

   Other notes chemistry and SI. samples collected

..../2.

KENYA RIFT VALLEY GEOTHERMAL PROJECT

BGS/GOK, MERD DATASHEET FOR WATER SAMPLES

1. Sampled by : WRD/DOA Sample No: 150
   Date : 19/9/88
   Sample type: WATER
   Temperature: AMBIENT

2. Place name : L. BARINGO
   Grid Ref. : AL 7150 6900 1:50,000 No.: 91/3
   Altitude (m):
   Access notes: BOAT

3. Description of springs

   Area of discharge
   Number of springs
   Flow rates (liters/second)
   Temperature (Max)
   Temperature (Range)
   Conductivity (μmhos)
   pH
   Gas (amount and constancy)
   Smell
   Type of encrustation/alteration
   Photograph
   Notes

4. Description of streams

   Approx. flow rate (liter/second)
   Conductivity (μmhos)
   pH
   Photograph
   Notes

5. Description of borehole sample

   Sample depth
   Discharge rate
   pH
   Conductivity (μmhos)
   Stratigraphy/lithology
   Notes

6. Descriptive notes of other samples (rainwater, lakewater)

   pH 9.05
   TURBID LAKEWATER, COLL. BETWEEN OL KOKWE ISLAND AND KAMPI YA SAMAKI

7. Description of geological setting

   Faulting (field evidence, photo interpretation)

   Volcanism (age and type of associated activity)

   Hydrothermal alteration (general description, ?sample)

   Other notes chemistry and S.I. samples collected

KENYA RIFT VALLEY GEOTHERMAL PROJECT

BGS/GOK, MERD DATASHEET FOR WATER SAMPLES

1. Sampled by : WGD / DJA Sample No: 151
   Date : 27·9·88
   Sample type: WATER
   Temperature: AMBIENT

2. Place name : TILAM LAKE (a) TILAM EARTH DAM (b)
   Grid Ref. : (a) AL 794094 90
   (b) AL 775 965 1:50,000 No.: 91/1
   Altitude (m):
   Access notes: VEHICLE

3. Description of springs

   Area of discharge
   Number of springs
   Flow rates (liters/second)
   Temperature (Max)
   Temperature (Range)
   Conductivity (μmhos)
   pH
   Gas (amount and constancy)
   Smell
   Type of encrustation/alteration
   Photograph
   Notes

4. Description of streams

   Approx. flow rate (liter/second)
   Conductivity (μmhos)
   pH
   Photograph
   Notes

5. Description of borehole sample

   Sample depth
   Discharge rate
   pH
   Conductivity (μmhos)
   Stratigraphy/lithology
   Notes

6. Descriptive notes of other samples (rainwater, lakewater)

   (a) pH = 8·70 condy = 108 μS
   (b) pH = 8·15 condy = 91 μS

   STAGNANT WATERS

7. Description of geological setting

   Faulting (field evidence, photo interpretation)

   Volcanism (age and type of associated activity)

   Hydrothermal alteration (general description, ?sample)

   Other notes Stable isotope samples only.

KENYA RIFT VALLEY GEOTHERMAL PROJECT

BGS/GOK, MERD DATASHEET FOR WATER SAMPLES

1. Sampled by : WGD / DJA Sample No: 152
   Date : 19.9.88
   Sample type: STEAM + GAS
   Temperature: 95.8°C

2. Place name : OL KOKWE OK1
   Grid Ref. : AL 7530 6925 1:50,000 No.: 91/3
   Altitude (m):
   Access notes: BOAT

3. Description of springs

   Area of discharge
   Number of springs
   Flow rates (liters/second)
   Temperature (Max)
   Temperature (Range)
   Conductivity (μmhos)
   pH
   Gas (amount and constancy)
   Smell
   Type of encrustation/alteration
   Photograph
   Notes

4. Description of streams

   Approx. flow rate (liter/second)
   Conductivity (μmhos)
   pH
   Photograph
   Notes

5. Description of borehole sample

   Sample depth
   Discharge rate
   pH
   Conductivity (μmhos)
   Stratigraphy/lithology
   Notes

6. Descriptive notes of other samples (rainwater, lakewater)

   FUMAROLE, MODERATE FLOW, SLIGHTLY SULPHUROUS
   pH = 5.90 96.0% CO_2 (ORSAT-TKB)

7. Description of geological setting

   Faulting (field evidence, photo interpretation)

   Volcanism (age and type of associated activity)

   Hydrothermal alteration (general description, ?sample)

   Other notes chemistry, S.I., gases, He isotopes, NaOH and $CdCl_2$ samples taken.

KENYA RIFT VALLEY GEOTHERMAL PROJECT

BGS/GOK, MERD DATASHEET FOR WATER SAMPLES

1. Sampled by : WGD/DJA Sample No: 153
   Date : 25.9.88
   Sample type: STEAM/GAS
   Temperature: 85.5°C

2. Place name : KIBROSI KR 10
   Grid Ref. : AL 791 869 1:50,000 No.: 91/1
   Altitude (m):
   Access notes: FOOT - LONG DISTANCE

3. Description of springs

   Area of discharge
   Number of springs
   Flow rates (liters/second)
   Temperature (Max)
   Temperature (Range)
   Conductivity (μmhos)
   pH
   Gas (amount and constancy)
   Smell
   Type of encrustation/alteration
   Photograph
   Notes

4. Description of streams

   Approx. flow rate (liter/second)
   Conductivity (μmhos)
   pH
   Photograph
   Notes

5. Description of borehole sample

   Sample depth
   Discharge rate
   pH
   Conductivity (μmhos)
   Stratigraphy/lithology
   Notes

6. Descriptive notes of other samples (rainwater, lakewater)

   FUMAROLE, WEAK FLOW.
   pH = 5.60 CO_2 = 6.4% (ORSAT - TKB)

7. Description of geological setting

   Faulting (field evidence, photo interpretation)

   Volcanism (age and type of associated activity)

   Hydrothermal alteration (general description, ?sample)

   Other notes Stable isotope sample only.

KENYA RIFT VALLEY GEOTHERMAL PROJECT

BGS/GOK, MERD DATASHEET FOR WATER SAMPLES

1. Sampled by : WBD/DJA Sample No: 154
   Date : 25.9.88
   Sample type: STEAM/GAS
   Temperature: 95.7°C

2. Place name : KAROSI KR 12
   Grid Ref. : AL 792 857 1:50,000 No.: 91/1
   Altitude (m):
   Access notes: FOOT, LONG DISTANCE

3. Description of springs

   Area of discharge
   Number of springs
   Flow rates (liters/second)
   Temperature (Max)
   Temperature (Range)
   Conductivity (μmhos)
   pH
   Gas (amount and constancy)
   Smell
   Type of encrustation/alteration
   Photograph
   Notes

4. Description of streams

   Approx. flow rate (liter/second)
   Conductivity (μmhos)
   pH
   Photograph
   Notes

5. Description of borehole sample

   Sample depth
   Discharge rate
   pH
   Conductivity (μmhos)
   Stratigraphy/lithology
   Notes

6. Descriptive notes of other samples (rainwater, lakewater)

   FUMAROLE, MODERATE FLOW
   pH = 5.05 CO_2 = 48.5% (TKB, ORSAT)

7. Description of geological setting

   Faulting (field evidence, photo interpretation)

   Volcanism (age and type of associated activity)

   Hydrothermal alteration (general description, ?sample)

   Other notes chemistry, S.I., gases, Helium isotope and NaOH samples collected

KENYA RIFT VALLEY GEOTHERMAL PROJECT

BGS/GOK, MERD DATASHEET FOR WATER SAMPLES

1. Sampled by : WGD/DSA Sample No: 155
   Date : 17.9.88
   Sample type: STEAM, GAS
   Temperature: 94°C

2. Place name : KAROSI KR50
   Grid Ref. : AL8817 9362 1:50,000 No.: 91/1
   Altitude (m):
   Access notes: FOOT, MEDIUM DISTANCE

3. Description of springs

   Area of discharge
   Number of springs
   Flow rates (liters/second)
   Temperature (Max)
   Temperature (Range)
   Conductivity (μmhos)
   pH
   Gas (amount and constancy)
   Smell
   Type of encrustation/alteration
   Photograph
   Notes

4. Description of streams

   Approx. flow rate (liter/second)
   Conductivity (μmhos)
   pH
   Photograph
   Notes

5. Description of borehole sample

   Sample depth
   Discharge rate
   pH
   Conductivity (μmhos)
   Stratigraphy/lithology
   Notes

6. Descriptive notes of other samples (rainwater, lakewater)

   FUMAROLE, MODERATE FLOW
   pH = 5.30 · CO_2 = 30.5% (ORSAT-TKB)

7. Description of geological setting

   Faulting (field evidence, photo interpretation)

   Volcanism (age and type of associated activity)

   Hydrothermal alteration (general description, ?sample)

   Other notes chemistry, S.I., gases and NaOH samples taken

..../2.

KENYA RIFT VALLEY GEOTHERMAL PROJECT

BGS/COK, MERD DATASHEET FOR WATER SAMPLES

1. Sampled by : WGD /OSA Sample No: 156
   Date : 21·9·89
   Sample type: STEAM /GAS
   Temperature: 96·4°c

2. Place name : KAROSI KR 52
   Grid Ref. : AL 87379330 1:50,000 No.: 91/1
   Altitude (m):
   Access notes: FOOT, MEDIUM DISTANCE

3. Description of springs

   Area of discharge
   Number of springs
   Flow rates (liters/second)
   Temperature (Max)
   Temperature (Range)
   Conductivity (μmhos)
   pH
   Gas (amount and constancy)
   Smell
   Type of encrustation/alteration
   Photograph
   Notes

4. Description of streams

   Approx. flow rate (liter/second)
   Conductivity (μmhos)
   pH
   Photograph
   Notes

5. Description of borehole sample

   Sample depth
   Discharge rate
   pH
   Conductivity (μmhos)
   Stratigraphy/lithology
   Notes

6. Descriptive notes of other samples (rainwater, lakewater)

   FUMAROLE, MODERATE FLOW

7. Description of geological setting

   Faulting (field evidence, photo interpretation)

   Volcanism (age and type of associated activity)

   Hydrothermal alteration (general description, ?sample)

   Other notes chemistry, S.I., gases, He isotopes and NaOH samples collected.

KENYA RIFT VALLEY GEOTHERMAL PROJECT

BGS/GOK, MERD DATASHEET FOR WATER SAMPLES

1. Sampled by : WGD/DSA Sample No: 157
   Date : 17.9.88
   Sample type: STEAM, GAS
   Temperature: 95.9°C

2. Place name : KAROSI KR 53
   Grid Ref. : AL 8741 9342 1:50,000 No.: 91/1
   Altitude (m):
   Access notes: FOOT, MEDIUM DISTANCE

3. Description of springs

   Area of discharge
   Number of springs
   Flow rates (liters/second)
   Temperature (Max)
   Temperature (Range)
   Conductivity (μmhos)
   pH
   Gas (amount and constancy)
   Smell
   Type of encrustation/alteration
   Photograph
   Notes

4. Description of streams

   Approx. flow rate (liter/second)
   Conductivity (μmhos)
   pH
   Photograph
   Notes

5. Description of borehole sample

   Sample depth
   Discharge rate
   pH
   Conductivity (μmhos)
   Stratigraphy/lithology
   Notes

6. Descriptive notes of other samples (rainwater, lakewater)

   MODERATE FUMAROLE.
   pH = 4.90 CO_2 = 96.7% (ORSAT - THB)

7. Description of geological setting

   Faulting (field evidence, photo interpretation)

   Volcanism (age and type of associated activity)

   Hydrothermal alteration (general description, ?sample)

   Other notes chemistry, S.I., gases and NaOH samples taken

KENYA RIFT VALLEY GEOTHERMAL PROJECT

BGS/GOK, MERD DATASHEET FOR WATER SAMPLES

1. Sampled by : WGD / DJA Sample No: 158
   Date : 27.9.88
   Sample type: STEAM, GAS
   Temperature: 90.1°C

2. Place name : KAROSI KR55
   Grid Ref. : AL 8005 9115 1:50,000 No.: 91/1
   Altitude (m):
   Access notes: FOOT, MEDIUM DISTANCE

3. Description of springs

   Area of discharge
   Number of springs
   Flow rates (liters/second)
   Temperature (Max)
   Temperature (Range)
   Conductivity (μmhos)
   pH
   Gas (amount and constancy)
   Smell
   Type of encrustation/alteration
   Photograph
   Notes

4. Description of streams

   Approx. flow rate (liter/second)
   Conductivity (μmhos)
   pH
   Photograph
   Notes

5. Description of borehole sample

   Sample depth
   Discharge rate
   pH
   Conductivity (μmhos)
   Stratigraphy/lithology
   Notes

6. Descriptive notes of other samples (rainwater, lakewater)

   WEAK FUMAROLE
   pH = 6.00

7. Description of geological setting

   Faulting (field evidence, photo interpretation)

   Volcanism (age and type of associated activity)

   Hydrothermal alteration (general description, ?sample)

   Other notes chemistry + S.I. samples only

KENYA RIFT VALLEY GEOTHERMAL PROJECT

BGS/GOK, MERD DATASHEET FOR WATER SAMPLES

1. Sampled by : WGD | DJA Sample No: 159
   Date : 16.9.88
   Sample type: STEAM, GAS
   Temperature: 95.4

2. Place name : KAROSI KRS7
   Grid Ref. : AL 7685 8935 1:50,000 No.: 91/1
   Altitude (m):
   Access notes: FOOT; MEDIUM DISTANCE

3. Description of springs

   Area of discharge
   Number of springs
   Flow rates (liters/second)
   Temperature (Max)
   Temperature (Range)
   Conductivity (μmhos)
   pH
   Gas (amount and constancy)
   Smell
   Type of encrustation/alteration
   Photograph
   Notes

4. Description of streams

   Approx. flow rate (liter/second)
   Conductivity (μmhos)
   pH
   Photograph
   Notes

5. Description of borehole sample

   Sample depth
   Discharge rate
   pH
   Conductivity (μmhos)
   Stratigraphy/lithology
   Notes

6. Descriptive notes of other samples (rainwater, lakewater)

   MODERATE FUMAROLE WITH CONDENSER.
   pH = 5.60 CO_2 = 17.5

7. Description of geological setting

   Faulting (field evidence, photo interpretation)

   Volcanism (age and type of associated activity)

   Hydrothermal alteration (general description, ?sample)

   Other notes chemistry, S.I. and gases sampled

KENYA RIFT VALLEY GEOTHERMAL PROJECT

BGS/GOK, MERD DATASHEET FOR WATER SAMPLES

1. Sampled by : WGO /DDA Sample No: 160
   Date :
   Sample type: STEAM
   Temperature: 82·5°c

2. Place name : KAROSI KR 58
   Grid Ref. : AL 7694 8990 1:50,000 No.: 91/1
   Altitude (m):
   Access notes: FOOT, MEDIUM DISTANCE

3. Description of springs

   Area of discharge
   Number of springs
   Flow rates (liters/second)
   Temperature (Max)
   Temperature (Range)
   Conductivity (μmhos)
   pH
   Gas (amount and constancy)
   Smell
   Type of encrustation/alteration
   Photograph
   Notes

4. Description of streams

   Approx. flow rate (liter/second)
   Conductivity (μmhos)
   pH
   Photograph
   Notes

5. Description of borehole sample

   Sample depth
   Discharge rate
   pH
   Conductivity (μmhos)
   Stratigraphy/lithology
   Notes

6. Descriptive notes of other samples (rainwater, lakewater)

   WEAK FUMAROLE
   pH = 6·45

7. Description of geological setting

   Faulting (field evidence, photo interpretation)

   Volcanism (age and type of associated activity)

   Hydrothermal alteration (general description, ?sample)

   Other notes Stable isotopes only sampled

KENYA RIFT VALLEY GEOTHERMAL PROJECT

BGS/GOK, MERD DATASHEET FOR WATER SAMPLES

1. Sampled by : WGD/DJA Sample No: 161
   Date : 16·9·88
   Sample type: STEAM
   Temperature: 91·5°C

2. Place name : KOROSI KR66
   Grid Ref. : AL 768 588 40 1:50,000 No.: 91/1
   Altitude (m):
   Access notes: FOOT, MEDIUM DISTANCE

3. Description of springs

   Area of discharge
   Number of springs
   Flow rates (liters/second)
   Temperature (Max)
   Temperature (Range)
   Conductivity (μmhos)
   pH
   Gas (amount and constancy)
   Smell
   Type of encrustation/alteration
   Photograph
   Notes

4. Description of streams

   Approx. flow rate (liter/second)
   Conductivity (μmhos)
   pH
   Photograph
   Notes

5. Description of borehole sample

   Sample depth
   Discharge rate
   pH
   Conductivity (μmhos)
   Stratigraphy/lithology
   Notes

6. Descriptive notes of other samples (rainwater, lakewater)

   WEAK FUMAROLE
   LOW CO_2 CONTENT

7. Description of geological setting

   Faulting (field evidence, photo interpretation)

   Volcanism (age and type of associated activity)

   Hydrothermal alteration (general description, ?sample)

   Other notes stable isotopes only sampled

KENYA RIFT VALLEY GEOTHERMAL PROJECT

BGS/GOK, MERD DATASHEET FOR WATER SAMPLES

1. Sampled by : WGD/DJA Sample No: 162
   Date : 15·9·88 (a) and 3·10·88 (b)
   Sample type: STEAM + GAS
   Temperature: (a) 93·1°c (b) 91·0°c

2. Place name : KR68 LORUK
   Grid Ref. : AL 6790 7375 1:50,000 No.: 91/3
   Altitude (m):
   Access notes: VEHICLE

3. Description of springs

   Area of discharge
   Number of springs
   Flow rates (liters/second)
   Temperature (Max)
   Temperature (Range)
   Conductivity (μmhos)
   pH
   Gas (amount and constancy)
   Smell
   Type of encrustation/alteration
   Photograph
   Notes

4. Description of streams

   Approx. flow rate (liter/second)
   Conductivity (μmhos)
   pH
   Photograph
   Notes

5. Description of borehole sample

   Sample depth
   Discharge rate
   pH
   Conductivity (μmhos)
   Stratigraphy/lithology
   Notes

6. Descriptive notes of other samples (rainwater, lakewater)

   WEAK FUMAROLE
   pH = 5.30
   CO_2 = 93.9 (orsat)

7. Description of geological setting

   Faulting (field evidence, photo interpretation)

   Volcanism (age and type of associated activity)

   Hydrothermal alteration (general description, ?sample)

   Other notes Samples collected :
   (a) chemistry, S.I., NaOH
   (b) chemistry, S.I., NaOH, gases, He

KENYA RIFT VALLEY GEOTHERMAL PROJECT

BGS/GOK, MERD DATASHEET FOR WATER SAMPLES

1. Sampled by : WGD/DJA Sample No: 163
   Date : 22.9.88
   Sample type: STEAM + GAS
   Temperature: 96.2°C

2. Place name : PAKA PK1 a
   Grid Ref. : AM 868 016 1:50,000 No.: 91/1
   Altitude (m):
   Access notes: FOOT - LONG DISTANCE

3. Description of springs

   Area of discharge
   Number of springs
   Flow rates (liters/second)
   Temperature (Max)
   Temperature (Range)
   Conductivity (μmhos)
   pH
   Gas (amount and constancy)
   Smell
   Type of encrustation/alteration
   Photograph
   Notes

4. Description of streams

   Approx. flow rate (liter/second)
   Conductivity (μmhos)
   pH
   Photograph
   Notes

5. Description of borehole sample

   Sample depth
   Discharge rate
   pH
   Conductivity (μmhos)
   Stratigraphy/lithology
   Notes

6. Descriptive notes of other samples (rainwater, lakewater)

   FAIRLY STRONG FUMAROLE
   HIGH CO_2 CONTENT

7. Description of geological setting

   Faulting (field evidence, photo interpretation)

   Volcanism (age and type of associated activity)

   Hydrothermal alteration (general description, ?sample)

   Other notes chemistry, S.I., NaOH, gases and He sampled

KENYA RIFT VALLEY GEOTHERMAL PROJECT

BGS/GOK, MERD DATASHEET FOR WATER SAMPLES

1. Sampled by : WGD/DJA Sample No: 164
   Date : 22.4.88
   Sample type: STEAM
   Temperature: 91.2°C

2. Place name : PAKA PK1 b
   Grid Ref. : AM 868 017 1:50,000 No.: 91/1
   Altitude (m):
   Access notes: FOOT, LONG DISTANCE

3. Description of springs

   Area of discharge
   Number of springs
   Flow rates (liters/second)
   Temperature (Max)
   Temperature (Range)
   Conductivity (μmhos)
   pH
   Gas (amount and constancy)
   Smell
   Type of encrustation/alteration
   Photograph
   Notes

4. Description of streams

   Approx. flow rate (liter/second)
   Conductivity (μmhos)
   pH
   Photograph
   Notes

5. Description of borehole sample

   Sample depth
   Discharge rate
   pH
   Conductivity (μmhos)
   Stratigraphy/lithology
   Notes

6. Descriptive notes of other samples (rainwater, lakewater)

   WEAK FUMAROLE

7. Description of geological setting

   Faulting (field evidence, photo interpretation)

   Volcanism (age and type of associated activity)

   Hydrothermal alteration (general description, ?sample)

   Other notes stable isotopes only sampled

KENYA RIFT VALLEY GEOTHERMAL PROJECT

BGS/GOK, MERD DATASHEET FOR WATER SAMPLES

1. Sampled by : WGD/OJA Sample No: 165
   Date : 22·9·88
   Sample type: STEAM
   Temperature: 91·0°C

2. Place name : PAKA PK1C
   Grid Ref. : AM 868 021 1:50,000 No.: 91/1
   Altitude (m):
   Access notes: FOOT, LONG DISTANCE

3. Description of springs

   Area of discharge
   Number of springs
   Flow rates (liters/second)
   Temperature (Max)
   Temperature (Range)
   Conductivity (μmhos)
   pH
   Gas (amount and constancy)
   Smell
   Type of encrustation/alteration
   Photograph
   Notes

4. Description of streams

   Approx. flow rate (liter/second)
   Conductivity (μmhos)
   pH
   Photograph
   Notes

5. Description of borehole sample

   Sample depth
   Discharge rate
   pH
   Conductivity (μmhos)
   Stratigraphy/lithology
   Notes

6. Descriptive notes of other samples (rainwater, lakewater)

   WEAK FUMAROLE

7. Description of geological setting

   Faulting (field evidence, photo interpretation)

   Volcanism (age and type of associated activity)

   Hydrothermal alteration (general description, ?sample)

   Other notes Stable isotopes only collected.

KENYA RIFT VALLEY GEOTHERMAL PROJECT

BGS/GOK, MERD DATASHEET FOR WATER SAMPLES

1. Sampled by : WGD / DJA Sample No: 166
   Date : 28·9·88
   Sample type: STEAM + GAS
   Temperature: 95·3°c

2. Place name : PAKA PK4 a
   Grid Ref. : AM 8675 0355 1:50,000 No.: 91/1
   Altitude (m):
   Access notes: FOOT, LONG DISTANCE

3. Description of springs

   Area of discharge
   Number of springs
   Flow rates (liters/second)
   Temperature (Max)
   Temperature (Range)
   Conductivity (μmhos)
   pH
   Gas (amount and constancy)
   Smell
   Type of encrustation/alteration
   Photograph
   Notes

4. Description of streams

   Approx. flow rate (liter/second)
   Conductivity (μmhos)
   pH
   Photograph
   Notes

5. Description of borehole sample

   Sample depth
   Discharge rate
   pH
   Conductivity (μmhos)
   Stratigraphy/lithology
   Notes

6. Descriptive notes of other samples (rainwater, lakewater)

   FAIRLY STRONG FUMAROLE
   pH = 4·55 CO_2 = 59·5% (ORSAT, TKB)

7. Description of geological setting

   Faulting (field evidence, photo interpretation)

   Volcanism (age and type of associated activity)

   Hydrothermal alteration (general description, ?sample)

   Other notes chemistry, S.I., NaOH, gases and $CdCl_2$ samples collected

KENYA RIFT VALLEY GEOTHERMAL PROJECT

BGS/GOK, MERD DATASHEET FOR WATER SAMPLES

1. Sampled by : WGD / DJA Sample No: 168
   Date : 1·10·88
   Sample type: STEAM + GAS
   Temperature: 94°c

2. Place name : PAKA PK7 a
   Grid Ref. : AM 891 010 1:50,000 No.: 9111
   Altitude (m):
   Access notes: FOOT - LONG DISTANCE

3. Description of springs

   Area of discharge
   Number of springs
   Flow rates (liters/second)
   Temperature (Max)
   Temperature (Range)
   Conductivity (μmhos)
   pH
   Gas (amount and constancy)
   Smell
   Type of encrustation/alteration
   Photograph
   Notes

4. Description of streams

   Approx. flow rate (liter/second)
   Conductivity (μmhos)
   pH
   Photograph
   Notes

5. Description of borehole sample

   Sample depth
   Discharge rate
   pH
   Conductivity (μmhos)
   Stratigraphy/lithology
   Notes

6. Descriptive notes of other samples (rainwater, lakewater)

   VIGOROUS FUMAROLE
   pH = 3·90 CO_2 = 67·0 % (ORSAT, TKB)

7. Description of geological setting

   Faulting (field evidence, photo interpretation)

   Volcanism (age and type of associated activity)

   Hydrothermal alteration (general description, ?sample)

   Other notes chemistry, S.I., NaOH, $CdCl_2$; gases and He isotope samples taken

KENYA RIFT VALLEY GEOTHERMAL PROJECT

BGS/GOK, MERD DATASHEET FOR WATER SAMPLES

1. Sampled by : WGD / DJA Sample No: 169
   Date : 1·10·88
   Sample type: STEAM
   Temperature: > 90°

2. Place name : PAKA PK7 b
   Grid Ref. : AM 885 014 1:50,000 No.: 91/1
   Altitude (m):
   Access notes: FOOT, LONG DISTANCE

3. Description of springs

   Area of discharge
   Number of springs
   Flow rates (liters/second)
   Temperature (Max)
   Temperature (Range)
   Conductivity (μmhos)
   pH
   Gas (amount and constancy)
   Smell
   Type of encrustation/alteration
   Photograph
   Notes

4. Description of streams

   Approx. flow rate (liter/second)
   Conductivity (μmhos)
   pH
   Photograph
   Notes

5. Description of borehole sample

   Sample depth
   Discharge rate
   pH
   Conductivity (μmhos)
   Stratigraphy/lithology
   Notes

6. Descriptive notes of other samples (rainwater, lakewater)

   FUMAROLE IN HISSING GROUND - LOW FLOW
   pH = 5·00 CO_2 ~ 6% (ORSAT, TK3)

7. Description of geological setting

   Faulting (field evidence, photo interpretation)

   Volcanism (age and type of associated activity)

   Hydrothermal alteration (general description, ?sample)

   Other notes Stable isotope only sampled

KENYA RIFT VALLEY GEOTHERMAL PROJECT

BGS/GOK, MERD DATASHEET FOR WATER SAMPLES

1. Sampled by : WGD /DJA Sample No: 170
   Date : 1·10·88
   Sample type: STEAM
   Temperature: >90°

2. Place name : PAKA PK7 C
   Grid Ref. : AM 886 011 1:50,000 No.: 91/1
   Altitude (m):
   Access notes: FOOT - LONG DISTANCE

3. Description of springs

   Area of discharge
   Number of springs
   Flow rates (liters/second)
   Temperature (Max)
   Temperature (Range)
   Conductivity (μmhos)
   pH
   Gas (amount and constancy)
   Smell
   Type of encrustation/alteration
   Photograph
   Notes

4. Description of streams

   Approx. flow rate (liter/second)
   Conductivity (μmhos)
   pH
   Photograph
   Notes

5. Description of borehole sample

   Sample depth
   Discharge rate
   pH
   Conductivity (μmhos)
   Stratigraphy/lithology
   Notes

6. Descriptive notes of other samples (rainwater, lakewater)

   WEAK FUMAROLE
   pH = 5·25 CO_2 ~ 3% (GREAT)

7. Description of geological setting

   Faulting (field evidence, photo interpretation)

   Volcanism (age and type of associated activity)

   Hydrothermal alteration (general description, ?sample)

   Other notes Stable isotopes only collected.

KENYA RIFT VALLEY GEOTHERMAL PROJECT

BGS/GOK, MERD DATASHEET FOR WATER SAMPLES

1. Sampled by : WGD / DJA Sample No: 171
   Date : 1·10·88
   Sample type: STEAM
   Temperature: 92·0°C

2. Place name : PAKA PK 7 d
   Grid Ref. : AM 890 012 1:50,000 No.: 91/1
   Altitude (m):
   Access notes: FOOT, LONG DISTANCE

3. Description of springs

   Area of discharge
   Number of springs
   Flow rates (liters/second)
   Temperature (Max)
   Temperature (Range)
   Conductivity (μmhos)
   pH
   Gas (amount and constancy)
   Smell
   Type of encrustation/alteration
   Photograph
   Notes

4. Description of streams

   Approx. flow rate (liter/second)
   Conductivity (μmhos)
   pH
   Photograph
   Notes

5. Description of borehole sample

   Sample depth
   Discharge rate
   pH
   Conductivity (μmhos)
   Stratigraphy/lithology
   Notes

6. Descriptive notes of other samples (rainwater, lakewater)

   STRONG FUMAROLE, LARGE VENT
   pH = 4·90 CO_2 = 5.6% (ORSAT-TKB)

7. Description of geological setting

   Faulting (field evidence, photo interpretation)

   Volcanism (age and type of associated activity)

   Hydrothermal alteration (general description, ?sample)

   Other notes chemistry and stable isotope samples collected