

## **2.2 Water Quality Data**



# KENYA INDUSTRIAL RESEARCH & DEVELOPMENT INSTITUTE

P.O. Box 30650 NAIROBI

## LABORATORY REPORT

BOREHOLE WATER SAMPLES

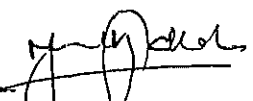
Material.....  
Laboratory No. 9265 to 9267 Sender's No. AS SHOWN BELOW  
Date Received 12-11-90 Sampled by SENDER  
Received from AQUASEARCH LIMITED Box 15072 NAIROBI

### RESULTS OF ANALYSIS

LAB. NO.	9265	9266	9267
SENDERS NO.	C 5627	C 3960	C 4573

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Silica ( Mg/LSiO <sub>2</sub> )	14.5	20.1	10.3
Nitrates (Mg/L NO <sub>3</sub> )	0.54	1.71	0.04

  
M.G.O. Omballah  
FOR DIRECTOR

Aquasearch Ltd.,  
P.O. Box 15072  
NAIROBI

Att: Mr. L. Lane

Res/W.7/6/126

To pay Kshs. 850/=

30/11/90

# KENYA INDUSTRIAL RESEARCH & DEVELOPMENT INSTITUTE

P.O. Box 30650 NAIROBI

## LABORATORY REPORT

Material.....BOREHOLE...WATER...SAMPLES.....  
Laboratory No.....9271 to 9275.....Sender's No.....AS SHOWN BELOW.....  
Date Received.....20-11-90.....Sampled by.....SENDER.....  
Received from.....Aquasearch Ltd.....

### RESULTS OF ANALYSIS

LAB NO.	9271	9273	9274	9275
SENDER NO.	C 7878	C 8810	C 3541	C 4124

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Silica content					
(mg/L SiO <sub>2</sub> )	12.8	18.8	16.3	15.4	8.13
Nitrates(mg/L NO <sub>3</sub> )	0.05	0.02	5.58	1.46	2.99



T. Ndonga  
FOR DIRECTOR

7-12-90  
RES/W7/6/132  
Aqua Search Ltd  
P.O. Box 15072  
NAIROBI

I -142

Att: Mr. Lane

# KENYA INDUSTRIAL RESEARCH & DEVELOPMENT INSTITUTE

P.O. Box 30650 NAIROBI

## LABORATORY REPORT

Material.....WATER  
Laboratory No.....9281 - 9283.....Sender's No.....C 3660 C 7064 C 9180  
Date Received.....30-11-90.....Sampled by.....OWNER  
Received from.....AQUA SEARCH LTD P.O. BOX 15672 NAIROBI

### RESULTS OF CHEMICAL ANALYSIS

Lab. No.	9281	9282	9283
Senders No.	C. 3660	C 7064	C. 9180

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Silica content as mg/L $\text{SiO}_2$	26.1	36.0	33
Nitrates (as mg/L $\text{NO}_3$ )	0.008	0.086	0.00

  
T. Ndonga

FOR DIRECTOR

17/12/90

Res/W7/6/133

Aqua Search Ltd  
P. O. Box 15072  
NAIROBI

Att: Mr. Lane

I -143

/rao

## LABORATORY REPORT

Material... Water Samples.....  
Laboratory No... 9289 - 9295..... Sender's No... as shown below.....  
Date Received... 6/12/90..... Sampled by... owner.....  
Received from... Aqua Search Limited - P.O. Box 15072, NAIROBI.....

### RESULTS OF CHEMICAL ANALYSIS

Lab. No.	9289	9290	9291	9292	9293	9294	9295
Sender's No.	C 6084	C 3861	C 7804	C 3959	C 3682	C 8062	C 7581
Nitrates (as mg/L $\text{NO}_3$ )	0.1	2.44	0.76	0.15	0.18	0.1	0.0
Silica (as mg/L $\text{SiO}_2$ )	30.0	28.5	27.2	28.9	28.5	27.6	27.2

  
T. NDONGA  
FOR: DIRECTOR

27/12/90

Res/W7/6/136

Aqua Search Limited,  
P.O. Box 15072,  
NAIROBI.

(Att: Mr. Lane)

To pay KShs.1680/= (Discount on filtration)

# KENYA INDUSTRIAL RESEARCH & DEVELOPMENT INSTITUTE

P.O. Box 30650 NAIROBI

## LABORATORY REPORT

Material....Water..Samples.....  
Laboratory No...9299 - 9301.....Sender's No...as..shown..below.....  
Date Received..17/12/90.....Sampled by...owner.....  
Received from...Aqua Search Limited - P.O. Box 15072, NAIROBI.....

### RESULTS OF CHEMICAL ANALYSIS

Lab. No.	9299	9300	9301
Sender's No.	C 4303	C 3625	C 8923
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Nitrates (as mg/L $\text{NO}_3^-$ )	0.01	0.24	0.0
Silica (as mg/L $\text{SiO}_2$ )	28.5	28.0	28.5



T. NDONGA  
FOR: DIRECTOR

31/12/90

Res/W7/6/137

Aqua Search Ltd.,  
P.O. Box 15072,  
NAIROBI.

Att: Mr. Lane

To pay KShs.880/= (Discount on filtration)

KENYA INDUSTRIAL RESEARCH & DEVELOPMENT INSTITUTE  
P.O. Box 30650 NAIROBI

## LABORATORY REPORT

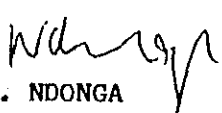
Material..... Water Samples  
Laboratory No..... 9303 - 9304..... Sender's No..... As Shown below  
Date Received..... 7.1.91..... Sampled by..... Owner  
Received from..... Aqua Search Ltd, P.O. Box 15072, Nairobi.....

### RESULTS OF CHEMICAL ANALYSIS

Lab No.	9403	9404
Sender's No.	C4415	C5894

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Nitrate (as mg/h $\text{No}_3$ )	8.50	19.71
Silica (as mg/h $\text{Sio}_2$ )	0.306	0.384

  
T. NDONGA  
for: DIRECTOR

18.1.91

res W7/6/141

Aqua Search Ltd  
P.O. Box 15072  
NAIROBI

(Att: Mr. Lane)

To pay KShs.680/=. Discount on filtration.

/tco



## LABORATORY REPORT

Material..... Water Samples.....  
Laboratory No..... 9304 - 9402..... Sender's No..... As shown below.....  
Date Received..... 2.1.91..... Sampled by..... Owner.....  
Received from..... Aqua Search Ltd, P.O. Box 15072, Nairobi.....

### RESULTS OF CHEMICAL ANALYSIS

Lab No.	9304	9305	9306	9307	9308
Sender's No.	C4442	C4729	C8298	C6975	C4270

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Nitrates (as mg/h $\text{No}_3$ )	3.234	5.095	5.050	0.00	0.00
Silica (as mg/h $\text{SiO}_2$ )	0.180	0.238	0.158	0.344	0.00

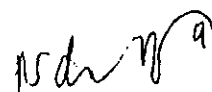
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Lab No.	9309	9400	9401	9402
Sender's No.	C5795	C3695	C7451	C5278

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Nitrates (as mg/h $\text{No}_3$ )	1.196	6.202	0.842	0.00
Silica (as mg/h $\text{SiO}_2$ )	0.00	0.00	0.234	0.212

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T. NDONGA  
for: DIRECTOR

18.1.91  
Res W7/6/140

Aqua Search Ltd  
P.O. Box 15072  
NAIROBI

(Att: Mr. Lane)  
I -147

To pay KShs.2,080/=. Discount on filtration

# KENYA INDUSTRIAL RESEARCH & DEVELOPMENT INSTITUTE

P.O. Box 30650 NAIROBI

## LABORATORY REPORT

Material..... WATER  
Laboratory No..... 9407 - 9503..... Sender's No..... AS SHOWN BELOW  
Date Received..... 15/1/91..... Sampled by..... OWNER  
Received from..... AQUA SEARCH LIMITED - P.O. BOX 15072 - NAIROBI

### RESULTS OF CHEMICAL ANALYSIS

Lab. No.	9407	9408	9409	9500	9501	9502	9503
Sender No.	C4422	C9400	C4130	C3360	C3981	C3463	C6498

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Nitrate (as $\text{Mg/LNO}_3$ )	1.20	14.20	3.7	2.21	14.2	2.84	5.7
Silica (as $\text{Mg/LSiO}_2$ )	0.14	0.20	0.14	0.16	0.11	0.25	0.11

  
T. NDONGA  
FOR : DIRECTOR

28th January, 1991

RES/W.7/6/145

Aqua Search Limited  
P.O. Box 15072  
NAIROBI

Att.: Mr. Lane

To pay 1680/- (Discount on Filtration)

TD/jmm

# KENYA INDUSTRIAL RESEARCH & DEVELOPMENT INSTITUTE

P.O. Box 30650 NAIROBI

## LABORATORY REPORT

Material..... Water Samples  
Laboratory No..... 9511, 9512, 9519, 9520, 9521..... Sender's No..... As shown  
Date Received..... 25 & 28/1/91..... Sampled by..... Owner  
Received from..... Aqua Search Limited, P.O. Box 15072, Nairobi

### RESULTS OF CHEMICAL ANALYSIS


Lab. No.	9511	9512	9519	9520	9521
Sender's No.	C6072	C9170	C6507	C3813	C9002

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Silica (Mg/L SiO <sub>2</sub> )	0.132	0.264	0.088	0.264	0.300
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Nitrate (Mg/L NO <sub>3</sub> )	2.0	27.0	0.44	226.0	0.221
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T. NDONGA  
for: DIRECTOR

14/2/91

Res W7/6/149

Aqua Search Limited  
P.O. Box 15072  
NAIROBI

Att: Mr. Lane

To pay KShs.1,280/- (Discount on filtration)

TN/tco

**KENYA INDUSTRIAL RESEARCH & DEVELOPMENT INSTITUTE**  
**P.O. Box 30650 NAIROBI**

## ***LABORATORY REPORT***

Material..... Water Samples  
Laboratory No..... 9538 - 9539..... Sender's No..... As shown  
Date Received..... 5/2/91..... Sampled by..... Owner  
Received from..... Aqua Search Limited, P.O. Box 15072, Nairobi

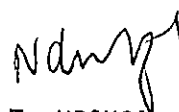
### RESULTS OF CHEMICAL ANALYSIS

Lab. No.	9538	9539
Sender's No.	C8062	C4246

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Silica (Mg.L SiO <sub>2</sub> )	1.00	0.156
Nitrate (Mg/L NO <sub>3</sub> )	18.61	5.54

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T. NDONGA  
for: DIRECTOR

14/2/91

Res W7/6/150

Aqua Search Ltd.  
P.O. Box 15072  
NAIROBI

Att: Mr. Lane

To pay KShs.680/- (Discount on filtration)

TN/tco

# MINISTRY OF WATER DEVELOPMENT

## Water Quality and Pollution Control Laboratory

Tel. No. 557088, Ext. 93  
P.O. Box 30521  
NAIROBI.

Vortex - Drilling,  
P.O. Box 17662,  
NAIROBI.

Date.....7th Feb. 1991.....

### WATER ANALYSIS REPORT

Sample No.....36.....

Date Received.....15.1.91.....

Source.....B/H C. 3360, Ruarenyi ranch (Taita - Taveta).....

Submitted by.....Vortex - Drill.....

Date of Sampling.....(Taita Taveta).....

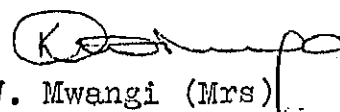
Purpose of Sampling.....Research.....

1.1.91

PARAMETERS	UNIT	RESULTS	REMARKS
pH	pH Scale	7.4	
Colour	mg pt/l	Less than 5	
Turbidity	N.T.U.	0.7	
Permanganate No. (20 min. boiling)	mgO <sub>2</sub> /l	1.6	
Conductivity (25°C)	µS/cm	1,505	
Iron	mgFe/l	0.1	
Manganese	mgMn/l	Less than 0.1	
Calcium	mgCa/l	103	
Magnesium	mgMg/l	67	
Sodium	mgNa/l	88	
Potassium	mgK/l	9.5	
Aluminium	mgAl/l	-	
Total Hardness	mgCaCO <sub>3</sub> /l	534	
Total Alkalinity	mgCaCO <sub>3</sub> /l	418	
Chloride mg Cl/l	mgCl/l	245	
Flouride	mgF/l	0.6	
Nitrate	mgN/l	- 2.2/	
Nitrite	mgN/l	Less than 0.01	
Ammonia	mgN/l	-	
Total Nitrogen	mgN/l	-	
Sulphate	mgSO <sub>4</sub> /l	130	
Orthophosphate	mgP/l	0.04	
Total Suspended Solids	mg/l	-	
Free Carbon Dioxide	mg/l	56	
Dissolved Oxygen	mg/l	-	
TDS	mg/l	903	
Others Bicarbonate	mgCaCO <sub>3</sub> /l	418	

COMMENTS: For research

0/6



for:

K.W. Mwangi (Mrs)  
Senior Chemist  
Water Quality Laboratory  
MINISTRY OF WATER DEVELOPMENT  
NAIROBI.

WATER QUALITY LABORATORY  
P.O. BOX 30521, NAIROBI

# MINISTRY OF WATER DEVELOPMENT

## Water Quality and Pollution Control Laboratory

Tel. No. 557088, Ext. 93  
P.O. Box 30521  
NAIROBI.

Vortex Drilling,  
P.O. Box 17662,  
NAIROBI.

Date.....7th February, 1991

### WATER ANALYSIS REPORT

Sample No. 37 Date Recieved. 15.1.91  
Source. 11191 B/H - C. 3463, Witu Police Station (Lamu) Vortex  
Date of Sampling. 1.1.91 (Station Lamu) Purpose of Sampling. Research

PARAMETERS	UNIT	RESULTS	REMARKS
pH	pH Scale	7.5	
Colour	mg pt/l	Less than 5	
Turbidity	N.T.U.	6.3	
Permanganate No. (20 min. boiling)	mgO <sub>2</sub> /l	0.8	
Conductivity (25°C)	μS/cm	1,300	
Iron	mgFe/l	0.5	
Manganese	mgMn/l	0.6	
Calcium	mgCa/l	27	
Magnesium	mgMg/l	7.3	
Sodium	mgNa/l	265	
Potassium	mgK/l	2.8	
Aluminium	mgAl/l	-	
Total Hardness	mgCaCO <sub>3</sub> /l	98	
Total Alkalinity	mgCaCO <sub>3</sub> /l	752	
Chloride mg Cl/l	mgCl/l	225	
Flouride	mgF/l	0.5	
Nitrate	mgN/l	- 284	
Nitrite	mgN/l	0.05	
Ammonia	mgN/l	-	
Total Nitrogen	mgN/l	-	
Sulphate	mgSO <sub>4</sub> /l	27	
Orthophosphate	mgP/l	0.08	
Total Suspended Solids	mg/l	-	
Free Carbon Dioxide	mg/l	56	
Dissolved Oxygen	mg/l	-	
TDS	mg/l	1,080	
Others Bicarbonate	mgCaCO <sub>3</sub> /l	752	

COMMENTS: For research

WATER QUALITY LABORATORY  
P.O. BOX 30521, NAIROBI

for:

K.W. Mwengi (Mrs)  
Senior Chemist  
Water Quality Laboratory  
MINISTRY OF WATER DEVELOPMENT  
NAIROBI.

# MINISTRY OF WATER DEVELOPMENT

## Water Quality and Pollution Control Laboratory

Tel. No. 557088, Ext. 93  
P.O. Box 30521  
NAIROBI.

Date..18-12-90.....

### WATER ANALYSIS REPORT

Sample No. 1417  
Source B/H - C 3541, Eldas (Wajir) ✓  
Date of Sampling 14-11-90.....

Date Recieved 21-11-90  
Submitted by Vortex drilling- Box 17662 NBI  
Purpose of Sampling Research

PARAMETERS	UNIT	RESULTS	REMARKS
pH	pH Scale	7.8	
Colour	mg pt/l	<5	
Turbidity	N.T.U.	1.3	
Permanganate No. (20 min. boiling)	mgO <sub>2</sub> /l	2.8	
Conductivity (25°C)	μS/cm	1350	
Iron	mgFe/l	0.1	
Manganese	mgMn/l	<0.1	
Calcium	mgCa/l	41	
Magnesium	mgMg/l	65	
Sodium	mgNa/l	309	
Potassium	mgK/l	9.6	
Aluminium	mgAl/l	-	
Total Hardness	mgCaCO <sub>3</sub> /l	390	
Total Alkalinity	mgCaCO <sub>3</sub> /l	402	
Chloride mg Cl/l	mgCl/l	215	
Flouride	mgF/l	0.2	
Nitrate	mgN/l	- 5.58	
Nitrite	mgN/l	<0.01	
Ammonia	mgN/l	-	
Total Nitrogen	mgN/l	-	
Sulphate	mgSO <sub>4</sub> /l	23	
Orthophosphate	mgP/l	<0.01	
Total Suspended Solids	mg/l	-	
Free Carbon Dioxide	mg/l	16	
Dissolved Oxygen	mg/l	-	
TDS	mg/l	810	
<del>Other</del> Bicarbonate	mg/lCaCO <sub>3</sub>	402	

#### COMMENTS:

For Research purposes

16.3

*M.A. Abira*

M.A. Abira (Mrs.)  
Senior Chemist

for: Water Quality Laboratory  
MINISTRY OF WATER DEVELOPMENT  
NAIROBI.

I -153  
WATER QUALITY LABORATORY  
P.O. BOX 30521, NAIROBI

# MINISTRY OF WATER DEVELOPMENT

## Water Quality and Pollution Control Laboratory

Tel. No. 557088, Ext. 93  
P.O. Box 30521  
NAIROBI.

P.O. Box 17662,  
NAIROBI.

Date.....22.1.1991.....

### WATER ANALYSIS REPORT

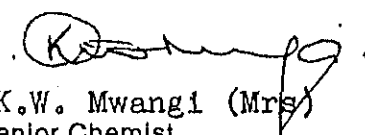
Sample No.....1538.....  
Source.....R/H - C. 3625 Laisamis (Marsabit)  
Date of Sampling.....3.12.90.....

Date Recieved.....17.12.90.....  
Submitted by.....Vortex drilling.....  
Purpose of Sampling.....

PARAMETERS	UNIT	RESULTS	REMARKS
pH	pH Scale	7.8	
Colour	mg pt/l	Less than 5	
Turbidity	N.T.U.	0.6	
Permanganate No. (20 min. boiling)	mgO <sub>2</sub> /l	0.4	
Conductivity (25°C)	µS/cm	1300	
Iron	mgFe/l	Less than 0.1	
Manganese	mgMn/l	Less than 0.1	
Calcium	mgCa/l	44	
Magnesium	mgMg/l	49	
Sodium	mgNa/l	176	
Potassium	mgK/l	13	
Aluminium	mgAl/l	-	
Total Hardness	mgCaCO <sub>3</sub> /l	306	
Total Alkalinity	mgCaCO <sub>3</sub> /l	638	
Chloride mg Cl/l	mgCl/l	124	
Flouride	mgF/l	2.0	
Nitrate	mgN/l	- 0.24	
Nitrite	mgN/l	Less than 0.01	
Ammonia	mgN/l	-	
Total Nitrogen	mgN/l	-	
Sulphate	mgSO <sub>4</sub> /l	37	
Orthophosphate	mgP/l	Less than 0.01	
Total Suspended Solids	mg/l	-	
Free Carbon Dioxide	mg/l	42	
Dissolved Oxygen	mg/l	-	
TDS	mg/l	-	
Others			

COMMENTS: For research purposes.

28.0

  
 K.W. Mwangi (Mrs)  
 for: Senior Chemist  
 Water Quality Laboratory  
 MINISTRY OF WATER DEVELOPMENT  
 NAIROBI.



# MINISTRY OF WATER DEVELOPMENT

## Water Quality and Pollution Control Laboratory

Tel. No. 557088, Ext. 93  
P.O. Box 30521  
NAIROBI.

P.O. Box 17662,  
NAIROBI.

Date.....22.1.91.....

### WATER ANALYSIS REPORT

Sample No.....1479.....

Date Recieved.....3.12.90.....

Source.....B/H - C, 3660, E.A.T.E.C. Uasin-Gishu Submitted by ~~Vortex~~ Drilling

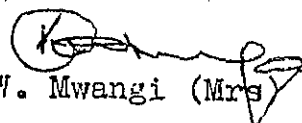
Date of Sampling.....24.11.90.....

Purpose of Sampling.....Domestic

PARAMETERS	UNIT	RESULTS	REMARKS
pH	pH Scale	8.7	
Colour	mg pt/l	Less than 5	
Turbidity	N.T.U.	0.3	
Permanganate No. (20 min. boiling)	mgO <sub>2</sub> /l	5.9	
Conductivity (25°C)	µS/cm	360	
Iron	mgFe/l	Less than 0.1	
Manganese	mgMn/l	Less than 0.1	
Calcium	mgCa/l	4.8	
Magnesium	mgMg/l	1.5	
Sodium	mgNa/l	67	
Potassium	mgK/l	4.1	
Aluminium	mgAl/l	-	
Total Hardness	mgCaCO <sub>3</sub> /l	18	
Total Alkalinity	mgCaCO <sub>3</sub> /l	206	
Chloride mg Cl/l	mgCl/l	8	
Flouride	mgF/l	0.4	
Nitrate	mgN/l	- 0.008	
Nitrite	mgN/l	Less than 0.01	
Ammonia	mgN/l	-	
Total Nitrogen	mgN/l	-	
Sulphate	mgSO <sub>4</sub> /l	40	
Orthophosphate	mgP/l	Less than 0.01	
Total Suspended Solids	mg/l	-	
Free Carbon Dioxide	mg/l	Nil	
Dissolved Oxygen	mg/l	-	
TDS	mg/l	216	
Others			

COMMENTS: For Research

>6.1

  
K.W. Mwangi (Mrs)

for:

I -155

Senior Chemist  
Water Quality Laboratory  
MINISTRY OF WATER DEVELOPMENT  
NAIROBI.

# MINISTRY OF WATER DEVELOPMENT

## Water Quality and Pollution Control Laboratory

Tel. No. 557088, Ext. 93  
P.O. Box 30521  
NAIROBI.

P.O. Box 17662,  
NAIROBI.

Date.....22.1.91.....

### WATER ANALYSIS REPORT

Sample No.....1502.....  
Source.....B/H - C. 3682, Logologo (Marsabit)  
Date of Sampling.....1.12.90.....

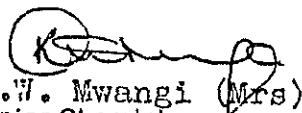
Date Recieved.....5.12.90.....  
Submitted by.....Vortex drilling  
Purpose of Sampling.....Domestic

PARAMETERS	UNIT	RESULTS	REMARKS
pH	pH Scale	7.9	
Colour	mg pt/l	Less than 5	
Turbidity	N.T.U.	0.7	
Permanganate No. (20 min. boiling)	mgO <sub>2</sub> /l	2.0	
Conductivity (25°C)	μS/cm	770	
Iron	mgFe/l	Less than 0.1	
Manganese	mgMn/l	Less than 0.1	
Calcium	mgCa/l	25	
Magnesium	mgMg/l	30	
Sodium	mgNa/l	85	
Potassium	mgK/l	11	
Aluminium	mgAl/l	-	
Total Hardness	mgCaCO <sub>3</sub> /l	184	
Total Alkalinity	mgCaCO <sub>3</sub> /l	400	
Chloride mg Cl/l	mgCl/l	50	
Flouride	mgF/l	0.6	
Nitrate	mgN/l	- 0.17	
Nitrite	mgN/l	Less than 0.01	
Ammonia	mgN/l	-	
Total Nitrogen	mgN/l	-	
Sulphate	mgSO <sub>4</sub> /l	9.6	
Orthophosphate	mgP/l	Less than 0.01	
Total Suspended Solids	mg/l	-	
Free Carbon Dioxide	mg/l	26	
Dissolved Oxygen	mg/l	-	
TDS	mg/l	-	
Others CO <sub>3</sub> <sup>2-</sup>	mgCaCO <sub>3</sub> /l	400	

COMMENTS: For researchh.

for:

I -156

  
 K.W. Mwangi (Mrs)  
 Senior Chemist  
 Water Quality Laboratory  
 MINISTRY OF WATER DEVELOPMENT  
 NAIROBI.

# MINISTRY OF WATER DEVELOPMENT

## Water Quality and Pollution Control Laboratory

Tel. No. 557088, Ext. 93  
P.O. Box 30521  
NAIROBI.

Vortex - drilling  
P.O. Box 17662, NAIROBI

Date ~~21.1.91~~ 7th Feb. 1991

### WATER ANALYSIS REPORT

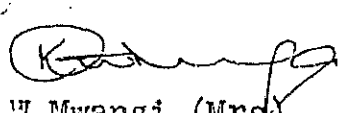
Sample No. 15  
Source B/H - C. 3695 Ifo (Garissa)  
Date of Sampling 15.12.90

Date Recieved 2.1.91  
Submitted by Vortex - Drilling  
Purpose of Sampling Research

PARAMETERS	UNIT	RESULTS	REMARKS
pH	pH Scale	7.8	
Colour	mg pt/l	Less than 5	
Turbidity	N.T.U.	0.8	
Permanganate No. (20 min. boiling)	mgO <sub>2</sub> /l	4.0	
Conductivity (25°C)	μS/cm	650	
Iron	mgFe/l	Less than 0.1	
Manganese	mgMn/l	Less than 0.1	
Calcium	mgCa/l	31	
Magnesium	mgMg/l	29	
Sodium	mgNa/l	66	
Potassium	mgK/l	15	
Aluminium	mgAl/l	-	
Total Hardness	mgCaCO <sub>3</sub> /l	194	
Total Alkalinity	mgCaCO <sub>3</sub> /l	362	
Chloride mg Cl/l	mgCl/l	35	
Flouride	mgF/l	0.8	
Nitrate	mgN/l	-	
Nitrite	mgN/l	Less than 0.01	
Ammonia	mgN/l	-	
Total Nitrogen	mgN/l	-	
Sulphate	mgSO <sub>4</sub> /l	37	
Orthophosphate	mgP/l	Less than 0.01	
Total Suspended Solids	mg/l	-	
Free Carbon Dioxide	mg/l	20	
Dissolved Oxygen	mg/l	-	
TDS	mg/l	390	
Others Bicarbonates	mgCaCO <sub>3</sub> /l	362	

COMMENTS: For research

WATER QUALITY LABORATORY  
P.O. BOX 30521, NAIROBI

0.00  
  
K.W. Mwangi (Mrs)  
for: Senior Chemist  
Water Quality Laboratory  
MINISTRY OF WATER DEVELOPMENT  
NAIROBI.

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## Water Quality and Pollution Control Laboratory

Tel. No. 557088, Ext. 93  
P.O. Box 30521  
NAIROBI.

P.O. Box 17662,  
NAIROBI.

Date.....21.2.1991.....

### WATER ANALYSIS REPORT

Sample No.....75.....

Date Recieved.....28.1.91.....

Source.....B/H - C.....3813, Makindu (Machakos)

Submitted by.....Vortex Drilling

Date of Sampling.....23.1.91.....

Purpose of Sampling.....Research

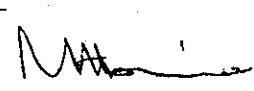
PARAMETERS	UNIT	RESULTS	REMARKS
pH	pH Scale	7.9	
Colour	mg pt/l	Less than 5	
Turbidity	N.T.U.	0.6	
Permanganate No. (20 min. boiling)	mgO <sub>2</sub> /l	1.2	
Conductivity (25°C)	μS/cm	5,000	
Iron	mgFe/l	Less than 0.1	
Manganese	mgMn/l	Less than 0.1	
Calcium	mgCa/l	513	
Magnesium	mgMg/l	204	
Sodium	mgNa/l	704	
Potassium	mgK/l	34	
Aluminium	mgAl/l	-	
Total Hardness	mgCaCO <sub>3</sub> /l	2,120	
Total Alkalinity	mgCaCO <sub>3</sub> /l	348	
Chloride mg Cl/l	mgCl/l	840	
Flouride	mgF/l	1.5	
Nitrate	mgN/l	- >6.0	
Nitrite	mgN/l	0.01	
Ammonia	mgN/l	-	
Total Nitrogen	mgN/l	-	
Sulphate	mgSO <sub>4</sub> /l	535.2	
Orthophosphate	mgP/l	Less than 0.01	
Total Suspended Solids	mg/l	-	
Free Carbon Dioxide	mg/l	56	
Dissolved Oxygen	mg/l	-	
TDS	mg/l	3,000	
Others Bicarbonates	mgCaCO <sub>3</sub> /l	348	

COMMENTS: For research

WATER QUALITY LABORATORY  
P.O. BOX 30521, NAIROBI

for:

I -158

0.264  
  
M.A. Abira (Mrs)  
Senior Chemist  
Water Quality Laboratory  
MINISTRY OF WATER DEVELOPMENT  
NAIROBI.

# MINISTRY OF WATER DEVELOPMENT

## Water Quality and Pollution Control Laboratory

Tel. No. 557088, Ext. 93  
P.O. Box 30521  
NAIROBI.

P.O. Box 17662,  
NAIROBI.

Date.....22.1.1991.....

### WATER ANALYSIS REPORT

Sample No.....1501.....  
Source.....B/H - C 3861, Asabaha 11 (Marsabit) <sup>mandera</sup>.....  
Date of Sampling.....28.11.90.....  
Date Recieved.....5.12.90.....  
Submitted by.....Vortex Drilling.....  
Purpose of Sampling.....Domestic.....

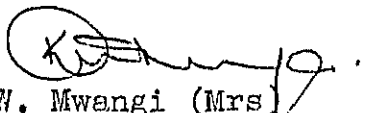
PARAMETERS	UNIT	RESULTS	REMARKS
pH	pH Scale	7.3	
Colour	mg pt/l	Less than 5	
Turbidity	N.T.U.	1.0	
Permanganate No. (20 min. boiling)	mgO <sub>2</sub> /l	2.0	
Conductivity (25°C)	µS/cm	3450	
Iron	mgFe/l	Less than 0.1	
Manganese	mgMn/l	Less than 0.1	
Calcium	mgCa/l	160	
Magnesium	mgMg/l	141	
Sodium	mgNa/l	353	
Potassium	mgK/l	19	
Aluminium	mgAl/l	-	
Total Hardness	mgCaCO <sub>3</sub> /l	980	
Total Alkalinity	mgCaCO <sub>3</sub> /l	360	
Chloride mg Cl/l	mgCl/l	167	
Flouride	mgF/l	2.0	
Nitrate	mgN/l	- 2.47	
Nitrite	mgN/l	Less than 0.01	
Ammonia	mgN/l	-	
Total Nitrogen	mgN/l	-	
Sulphate	mgSO <sub>4</sub> /l	106	
Orthophosphate	mgP/l	Less than 0.01	
Total Suspended Solids	mg/l	-	
Free Carbon Dioxide	mg/l	30	
Dissolved Oxygen	mg/l	-	
TDS	mg/l	2070	
Others CO <sub>3</sub> <sup>-</sup>	mgCaCO <sub>3</sub> /l	360	

COMMENTS: For Res earch

28.5

for:

I -159

  
K.W. Mwangi (Mrs)  
Senior Chemist  
Water Quality Laboratory  
MINISTRY OF WATER DEVELOPMENT  
NAIROBI.

# MINISTRY OF WATER DEVELOPMENT

## Water Quality and Pollution Control Laboratory

Tel. No. 557088, Ext. 93  
P.O. Box 30521  
NAIROBI.

Date 18th Dec, 1990

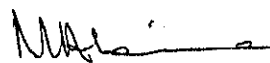
### WATER ANALYSIS REPORT

Sample No. 1415  
Source B/H - C 3899 Dambas (Wajir) ✓  
Date of Sampling 6-11-90

Date Received 21-11-90  
Submitted by Vortex drilling- Box 17662 NBI  
Purpose of Sampling Research

PARAMETERS	UNIT	RESULTS	REMARKS
pH	pH Scale	7.2	
Colour	mg pt/l	<5	
Turbidity	N.T.U.	0.5	
Permanganate No. (20 min. boiling)	mgO <sub>2</sub> /l	4.4	
Conductivity (25°C)	μS/cm	4900	
Iron	mgFe/l	<0.1	
Manganese	mgMn/l	<0.1	
Calcium	mgCa/l	208	
Magnesium	mgMg/l	294	
Sodium	mgNa/l	617	
Potassium	mgK/l	42	
Aluminium	mgAl/l	-	
Total Hardness	mgCaCO <sub>3</sub> /l	1710	
Total Alkalinity	mgCaCO <sub>3</sub> /l	118	
Chloride mg Cl/l	mgCl/l	1396	
Fluoride	mgF/l	<0.1	
Nitrate	mgN/l	-	
Nitrite	mgN/l	<0.01	
Ammonia	mgN/l	-	
Total Nitrogen	mgN/l	-	
Sulphate	mgSO <sub>4</sub> /l	83	
Orthophosphate	mgP/l	-	
Total Suspended Solids	mg/l	-	
Free Carbon Dioxide	mg/l	50	
Dissolved Oxygen	mg/l	-	
TDS	mg/l	2940	
Other Bicarbonate	mg/l CaCO <sub>3</sub>	118	

COMMENTS: For research purposes

  
M.A. Abira (Mrs)

for: Senior Chemist  
Water Quality Laboratory

WATER QUALITY LABORATORY MINISTRY OF WATER DEVELOPMENT  
P.O. BOX 30521, NAIROBI NAIROBI.

# MINISTRY OF WATER DEVELOPMENT

## Water Quality and Pollution Control Laboratory

Tel. No. 557088, Ext. 93  
P.O. Box 30521  
NAIROBI.

Vortex - drilling  
P.O. Box 17662, NBI

Date 22.1.91

### WATER ANALYSIS REPORT

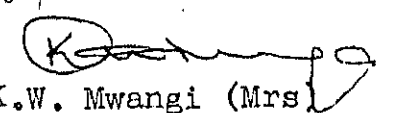
Sample No. 1498  
Source B/H - C 3959, Butie marsabit  
Date of Sampling 18.11.90

Date Recieved ~~Vortex~~ 5.12.90  
Submitted by Vortex  
Purpose of Sampling Domestic

PARAMETERS	UNIT	RESULTS	REMARKS
pH	pH Scale	7.2	
Colour	mg pt/l	Less than 5	
Turbidity	N.T.U.	2.4	
Permanganate No. (20 min. boiling)	mgO <sub>2</sub> /l	1.2	
Conductivity (25°C)	µS/cm	1650	
Iron	mgFe/l	Less than 0.1	
Manganese	mgMn/l	Less than 0.1	
Calcium	mgCa/l	122	
Magnesium	mgMg/l	50	
Sodium	mgNa/l	199	
Potassium	mgK/l	4.5	
Aluminium	mgAl/l	-	
Total Hardness	mgCaCO <sub>3</sub> /l	510	
Total Alkalinity	mgCaCO <sub>3</sub> /l	470	
Chloride mg Cl/l	mgCl/l	282	
Flouride	mgF/l	0.8	
Nitrate	mgN/l	- 0.15	
Nitrite	mgN/l	Less than 0.01	
Ammonia	mgN/l	-	
Total Nitrogen	mgN/l	-	
Sulphate	mgSO <sub>4</sub> /l	133	
Orthophosphate	mgP/l	Less than 0.01	
Total Suspended Solids	mg/l	-	
Free Carbon Dioxide	mg/l	78	
Dissolved Oxygen	mg/l	-	
TDS	mg/l	990	
Others CO <sub>3</sub> -	mgCaCO <sub>3</sub> /l	470	

COMMENTS: For research

- 28.9

  
K.W. Mwangi (Mrs)

for: Senior Chemist  
Water Quality Laboratory  
MINISTRY OF WATER DEVELOPMENT  
NAIROBI.

# MINISTRY OF WATER DEVELOPMENT

## Water Quality and Pollution Control Laboratory

Tel. No. 557088, Ext. 93  
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NAIROBI.

Date..18th..Dec.....1990.....

### WATER ANALYSIS REPORT

Sample No. 1363  
Source B/H...C. 3960...Kargi (Marsabit)  
Date of Sampling 3-11-90

Date Recieved 12-11-90  
Submitted by Votex drilling-Box 17  
Purpose of Sampling Research NBI

PARAMETERS	UNIT	RESULTS	REMARKS
pH	pH Scale	8.6	
Colour	mg pt/l	5	
Turbidity	N.T.U.	1.0	
Permanganate No. (20 min. boiling)	mgO <sub>2</sub> /l	1.6	
Conductivity (25°C)	µS/cm	2650	
Iron	mgFe/l	<0.1	
Manganese	mgMn/l	<0.1	
Calcium	mgCa/l	7.2	
Magnesium	mgMg/l	11	
Sodium	mgNa/l	525	
Potassium	mgK/l	13	
Aluminium	mgAl/l	-	
Total Hardness	mgCaCO <sub>3</sub> /l	62	
Total Alkalinity	mgCaCO <sub>3</sub> /l	874	
Chloride mg Cl/l	mgCl/l	372	
Flouride	mgF/l	1.5	
Nitrate	mgN/l	- 1.71	
Nitrite	mgN/l	<0.01	
Ammonia	mgN/l	-	
Total Nitrogen	mgN/l	-	
Sulphate	mgSO <sub>4</sub> /l	20	
Orthophosphate	mgP/l	<0.01	
Total Suspended Solids	mg/l	-	
Free Carbon Dioxide	mg/l	-	
<del>Dissolved Oxygen</del> Carbonate	mg/l	164	
TDS	mg/l CaCO <sub>3</sub>	10 1598	
<del>Dissolved Oxygen</del> Bicarbonate	mg/CaCO <sub>3</sub>	710	

#### COMMENTS:

For research purposes

I -162

WATER QUALITY LABORATORY  
P.O. BOX 30521 NAIROBI

M.A. Abira (Mrs)  
for: Senior Chemist  
Water Quality Laboratory  
MINISTRY OF WATER DEVELOPMENT  
NAIROBI.



# MINISTRY OF WATER DEVELOPMENT

## Water Quality and Pollution Control Laboratory

Tel. No. 557088, Ext. 93  
P.O. Box 30521  
NAIROBI.

Date 18th-Dec., 1990

### WATER ANALYSIS REPORT

Sample No. 1415  
Source B/H-C-4124, Wajir, MOWD, Camp  
Date of Sampling 9-11-90

Date Recieved 21-11-90  
Submitted by Vortex drilling Box  
Purpose of Sampling 17662 NBI

Research

PARAMETERS	UNIT	RESULTS	REMARKS
pH	pH Scale	7.7	
Colour	mg pt/l	<5	
Turbidity	N.T.U.	38	
Permanganate No. (20 min. boiling)	mgO <sub>2</sub> /l	0.4	
Conductivity (25°C)	µS/cm	1530	
Iron	mgFe/l	1.2	
Manganese	mgMn/l	0.1	
Calcium	mgCa/l	49	
Magnesium	mgMg/l	44	
Sodium	mgNa/l	243	
Potassium	mgK/l	27	
Aluminium	mgAl/l	-	
Total Hardness	mgCaCO <sub>3</sub> /l	302	
Total Alkalinity	mgCaCO <sub>3</sub> /l	340	
Chloride mg Cl/l	mgCl/l	495	
Flouride	mgF/l	1.0	
Nitrate	mgN/l	- >99	
Nitrite	mgN/l	0.01	
Ammonia	mgN/l	-	
Total Nitrogen	mgN/l	-	
Sulphate	mgSO <sub>4</sub> /l	12	
Orthophosphate	mgP/l	<0.01	
Total Suspended Solids	mg/l	-	
Free Carbon Dioxide	mg/l	8	
Dissolved Oxygen	mg/l	-	
TDS	mg/l	918	
Other Bicarbonate	mg/l CaCO <sub>3</sub>	340	

COMMENTS:

For Research purposes

8.13

I -163

WATER QUALITY LABORATORY  
P.O. BOX 30521, NAIROBI

for: M.A. Abira (Mrs)  
Senior Chemist  
Water Quality Laboratory  
MINISTRY OF WATER DEVELOPMENT  
NAIROBI.

# MINISTRY OF WATER DEVELOPMENT

## Water Quality and Pollution Control Laboratory

Tel. No. 557088, Ext. 93  
P.O. Box 30521  
NAIROBI.

Vortex drilling  
P.O. Box 17662,  
NAIROBI.

Date..... 7th Feb. 1991

### WATER ANALYSIS REPORT

Sample No..... 35  
Source..... B/H - C 4130, Taveta Town  
Date of Sampling..... 28.12.90

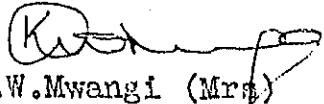
Date Recieved..... 15.1.91  
Submitted by..... Vortex Drilling  
Purpose of Sampling..... Research

PARAMETERS	UNIT	RESULTS	REMARKS
pH	pH Scale	7.4	
Colour	mg pt/l	Less than 5	
Turbidity	N.T.U.	0.6	
Permanganate No. (20 min. boiling)	mgO <sub>2</sub> /l	1.6	
Conductivity (25°C)	μS/cm	270	
Iron	mgFe/l	Less than 0.1	
Manganese	mgMn/l	Less than 0.1	
Calcium	mgCa/l	16	
Magnesium	mgMg/l	21	
Sodium	mgNa/l	9.5	
Potassium	mgK/l	4.5	
Aluminium	mgAl/l	-	
Total Hardness	mgCaCO <sub>3</sub> /l	126	
Total Alkalinity	mgCaCO <sub>3</sub> /l	138	
Chloride mg Cl/l	mgCl/l	6	
Flouride	mgF/l	0.2	
Nitrate	mgN/l	- 3.7	
Nitrite	mgN/l	0.01	
Ammonia	mgN/l	-	
Total Nitrogen	mgN/l	-	
Sulphate	mgSO <sub>4</sub> /l	1.7	
Orthophosphate	mgP/l	0.06	
Total Suspended Solids	mg/l	-	
Free Carbon Dioxide	mg/l	10	
Dissolved Oxygen	mg/l	-	
TDS	mg/l	162	
Others Bicarbonates	mgCaCO <sub>3</sub> /l	138	

COMMENTS: For research

0.14

WATER QUALITY LABORATORY  
P.O. BOX 30521, NAIROBI

  
 K.W. Mwangi (Mrs)  
 for: Senior Chemist  
 Water Quality Laboratory  
 MINISTRY OF WATER DEVELOPMENT  
 NAIROBI.

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Tel. No. 557088, Ext. 93  
P.O. Box 30521  
NAIROBI.

Vortex drilling,  
P.O. Box 17662,  
NAIROBI.

Date.....21.2.1991.....

### WATER ANALYSIS REPORT

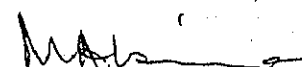
Sample No. 88  
Source.....B/H - C 4246, Olembo Sec School  
(Nyandarua)  
Date of Sampling.....27.1.91.....

Date Recieved.....5.2.91.....  
Submitted by.....Vortex drilling  
Purpose of Sampling.....Research

PARAMETERS	UNIT	RESULTS	REMARKS
pH	pH Scale	8.3	
Colour	mg pt/l	Less than 5	
Turbidity	N.T.U.	0.5	
Permanganate No. (20 min. boiling)	mgO <sub>2</sub> /l	0.38	
Conductivity (25°C)	µS/cm	1,100	
Iron	mgFe/l	Less than 0.1	
Manganese	mgMn/l	Less than 0.1	
Calcium	mgCa/l	84	
Magnesium	mgMg/l	44	
Sodium	mgNa/l	53	
Potassium	mgK/l	6	
Aluminium	mgAl/l	-	
Total Hardness	mgCaCO <sub>3</sub> /l	390	
Total Alkalinity	mgCaCO <sub>3</sub> /l	560	
Chloride mg Cl/l	mgCl/l	35	
Flouride	mgF/l	2.0	
Nitrate	mgN/l	- 5.54	
Nitrite	mgN/l	-	
Ammonia	mgN/l	-	
Total Nitrogen	mgN/l	-	
Sulphate	mgSO <sub>4</sub> /l	25.6	
Orthophosphate	mgP/l	Less than 0.01	
Total Suspended Solids	mg/l	-	
Free Carbon Dioxide	mg/l	58	
Dissolved Oxygen	mg/l	-	
TDS	mg/l	660	
Others Bicarbonates	mgCaCO <sub>3</sub> /l	560	

COMMENTS:

For Research

0.156 

WATER QUALITY LABORATORY  
P.O. BOX 30521, NAIROBI

I -165

for: M.A. Abira (Mrs)  
Senior Chemist  
Water Quality Laboratory  
MINISTRY OF WATER DEVELOPMENT  
NAIROBI.

# MINISTRY OF WATER DEVELOPMENT

## Water Quality and Pollution Control Laboratory

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NAIROBI.

Vortex - Drilling,  
P.O. Box 17662,  
NAIROBI.

Date.....7th Feb. 1991.....

### WATER ANALYSIS REPORT

Sample No. 14  
Source B/H - C 4270, Abakaily (Garissa)  
Date of Sampling 13.12.90

Date Recieved 2.1.91  
Submitted by Vortex - Drilling  
Purpose of Sampling Research

PARAMETERS	UNIT	RESULTS	REMARKS
pH	pH Scale	8.6	
Colour	mg pt/l	Less than 5	
Turbidity	N.T.U.	0.5	
Permanganate No. (20 min. boiling)	mgO <sub>2</sub> /l	1.6	
Conductivity (25°C)	μS/cm	1,350	
Iron	mgFe/l	Less than 0.1	
Manganese	mgMn/l	Less than 0.1	
Calcium	mgCa/l	1.6	
Magnesium	mgMg/l	3.4	
Sodium	mgNa/l	397	
Potassium	mgK/l	3.2	
Aluminium	mgAl/l	-	
Total Hardness	mgCaCO <sub>3</sub> /l	18	
Total Alkalinity	mgCaCO <sub>3</sub> /l	628	
Chloride mg Cl/l	mgCl/l	64	
Flouride	mgF/l	1.5	
Nitrate	mgN/l	- 0.00	
Nitrite	mgN/l	Less than 0.01	
Ammonia	mgN/l	-	
Total Nitrogen	mgN/l	-	
Sulphate	mgSO <sub>4</sub> /l	65	
Orthophosphate	mgP/l	Less than 0.01	
Total Suspended Solids	mg/l	-	
Free Carbon Dioxide	mg/l	Nil	
Dissolved Oxygen	mg/l	-	
TDS	mg/l	-	
Others Carbonates	mgCaCO <sub>3</sub> /l	52	

COMMENTS: Bicarbonates  
For Research

mgCaCO<sub>3</sub>/l 576

0.00 

WATER QUALITY LABORATORY  
P.O. BOX 30521, NAIROBI

for:

K.W. Mwangi (Mrs)  
Senior Chemist  
Water Quality Laboratory  
MINISTRY OF WATER DEVELOPMENT  
NAIROBI.

# MINISTRY OF WATER DEVELOPMENT

## Water Quality and Pollution Control Laboratory

Tel. No. 557088, Ext. 93  
P.O. Box 30521  
NAIROBI.

P.O. Box 17662,  
NAIROBI.

Date...22.1.91.....

### WATER ANALYSIS REPORT

Sample No. 1526  
Source... B/H - G 4303, Kiamokama tea factory  
Date of Sampling... 13.12.90 (KISII)

Date Recieved...13.12.90.....  
Submitted by...Vortex drilling  
Purpose of Sampling...Research

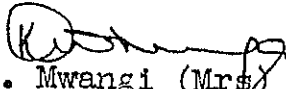
PARAMETERS	UNIT	RESULTS	REMARKS
pH	pH Scale	7.2	
Colour	mg pt/l	Less than 5	
Turbidity	N.T.U.	1.0	
Permanganate No. (20 min. boiling)	mgO <sub>2</sub> /l	1.2	
Conductivity (25°C)	µS/cm	103	
Iron	mgFe/l	Less than 0.1	
Manganese	mgMn/l	Less than 0.1	
Calcium	mgCa/l	8.8	
Magnesium	mgMg/l	5.3	
Sodium	mgNa/l	7.4	
Potassium	mgK/l	6.1	
Aluminium	mgAl/l	-	
Total Hardness	mgCaCO <sub>3</sub> /l	44	
Total Alkalinity	mgCaCO <sub>3</sub> /l	56	
Chloride mg Cl/l	mgCl/l	5.0	
Flouride	mgF/l	1.0	
Nitrate	mgN/l	- 0.01	
Nitrite	mgN/l	Less than 0.01	
Ammonia	mgN/l	-	
Total Nitrogen	mgN/l	-	
Sulphate	mgSO <sub>4</sub> /l	3.8	
Orthophosphate	mgP/l	Less than 0.01	
Total Suspended Solids	mg/l	-	
Free Carbon Dioxide	mg/l	70	
Dissolved Oxygen	mg/l	-	
TDS	mg/l	62	
Others			

COMMENTS: For research purposes.

28.5

for:

I -167

  
K.W. Mwangi (Mrs)  
Senior Chemist  
Water Quality Laboratory  
MINISTRY OF WATER DEVELOPMENT  
NAIROBI.

# MINISTRY OF WATER DEVELOPMENT

## Water Quality and Pollution Control Laboratory

Tel. No. 557088, Ext. 93  
P.O. Box 30521  
NAIROBI.

Date...7th February...1991

### WATER ANALYSIS REPORT

Sample No. 23  
Source...B/H - C 4415, Kisisiz (Kajiado)  
Date of Sampling...1.1.91

Date Received...7.1.91  
Submitted by...Vortex Drilling  
Purpose of Sampling...Research

PARAMETERS	UNIT	RESULTS	REMARKS
pH	pH Scale	8.2	
Colour	mg pt/l	Less than 5	
Turbidity	N.T.U.	0.5	
Permanganate No. (20 min. boiling)	mgO <sub>2</sub> /l	0.4	
Conductivity (25°C)	μS/cm	1,340	
Iron	mgFe/l	Less than 0.1	
Manganese	mgMn/l	Less than 0.1	
Calcium	mgCa/l	14	
Magnesium	mgMg/l	6.3	
Sodium	mgNa/l	243	
Potassium	mgK/l	19	
Aluminium	mgAl/l	-	
Total Hardness	mgCaCO <sub>3</sub> /l	60	
Total Alkalinity	mgCaCO <sub>3</sub> /l	502	
Chloride mg Cl/l	mgCl/l	154	
Flouride	mgF/l	2.0	
Nitrate	mgN/l	- 8.50	
Nitrite	mgN/l	Less than 0.01	
Ammonia	mgN/l	-	
Total Nitrogen	mgN/l	-	
Sulphate	mgSO <sub>4</sub> /l	38	
Orthophosphate	mgP/l	Less than 0.01	
Total Suspended Solids	mg/l	-	
Free Carbon Dioxide	mg/l	20	
Dissolved Oxygen	mg/l	-	
TDS	mg/l	804	
Others Bicarbonates	mgCaCO <sub>3</sub> /l	502	

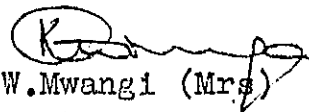
COMMENTS: For research

0.306

WATER QUALITY LABORATORY  
P.O. BOX 30521, NAIROBI

for:

I -168

  
K.W. Mwangi (Mrs)  
Senior Chemist  
Water Quality Laboratory  
MINISTRY OF WATER DEVELOPMENT  
NAIROBI.

# MINISTRY OF WATER DEVELOPMENT

## Water Quality and Pollution Control Laboratory

Tel. No. 557088, Ext. 93  
P.O. Box 30521  
NAIROBI.

Vortex Drilling  
P.O. Box 17662,  
NAIROBI.

Date.....7th February, 1991

### WATER ANALYSIS REPORT

Sample No.....40.....  
Source.....B/H.....G.....4422, Ganze Ser. School  
Date of Sampling.....(Kilifi).....  
10.12.91

Date Recieved.....15.1.91  
Submitted by.....Vortex Drilling  
Purpose of Sampling.....Research

PARAMETERS	UNIT	RESULTS	REMARKS
pH	pH Scale	8.5	
Colour	mg pt/l	5.0	
Turbidity	N.T.U.	4.0	
Permanganate No. (20 min. boiling)	mgO <sub>2</sub> /l	4.0	
Conductivity (25°C)	µS/cm	3,650	
Iron	mgFe/l	0.8	
Manganese	mgMn/l	Less than 0.1	
Calcium	mgCa/l	3.2	
Magnesium	mgMg/l	1.0	
Sodium	mgNa/l	684	
Potassium	mgK/l	4.1	
Aluminium	mgAl/l	-	
Total Hardness	mgCaCO <sub>3</sub> /l	12	
Total Alkalinity	mgCaCO <sub>3</sub> /l	1,434	
Chloride mg Cl/l	mgCl/l	680	
Flouride	mgF/l	2.0	
Nitrate	mgN/l	- 1.20	
Nitrite	mgN/l	Less than 0.01	
Ammonia	mgN/l	-	
Total Nitrogen	mgN/l	-	
Sulphate	mgSO <sub>4</sub> /l	1.5	
Orthophosphate	mgP/l	0.12	
Total Suspended Solids	mg/l	-	
Free Carbon Dioxide	mg/l	Nil	
Dissolved Oxygen	mg/l	-	
TDS	mg/l	2,190	
Others Carbonates	mgCaCO <sub>3</sub> /l	128	

COMMENTS: Bicarbonates mgCaCO<sub>3</sub>/l 1,306

WATER QUALITY LABORATORY  
P.O. BOX 30521, NAIROBI

for:

K.W. Mwangi (Mrs)  
Senior Chemist  
Water Quality Laboratory  
MINISTRY OF WATER DEVELOPMENT  
NAIROBI.

# MINISTRY OF WATER DEVELOPMENT

## Water Quality and Pollution Control Laboratory

Tel. No. 557088, Ext. 93 Vortex - Drilling  
P.O. Box 30521 P.O. Box 17662, NAIROBI.  
NAIROBI.

Date.....7th Feb. 1991.....

### WATER ANALYSIS REPORT

Sample No. 13  
Source.....B/H - C. 4442, M.O.W.D. Lamek (Narok)  
Date of Sampling.....13.12.90.....

Date Received.....2.1.91  
Submitted by.....Vortex - Drilling  
Purpose of Sampling.....Research

PARAMETERS	UNIT	RESULTS	REMARKS
pH	pH Scale	8.2	
Colour	mg pt/l	Less than 5	
Turbidity	N.T.U.	0.6	
Permanganate No. (20 min. boiling)	mgO <sub>2</sub> /l	1.6	
Conductivity (25°C)	μS/cm	650	
Iron	mgFe/l	Less than 0.1	
Manganese	mgMn/l	Less than 0.1	
Calcium	mgCa/l	14	
Magnesium	mgMg/l	10	
Sodium	mgNa/l	44	
Potassium	mgK/l	46	
Aluminium	mgAl/l	-	
Total Hardness	mgCaCO <sub>3</sub> /l	76	
Total Alkalinity	mgCaCO <sub>3</sub> /l	350	
Chloride mg Cl/l	mgCl/l	19	
Flouride	mgF/l	2.0	
Nitrate	mgN/l	- 3.34	
Nitrite	mgN/l	Less than 0.01	
Ammonia	mgN/l	-	
Total Nitrogen	mgN/l	-	
Sulphate	mgSO <sub>4</sub> /l	36	
Orthophosphate	mgP/l	Less than 0.01	
Total Suspended Solids	mg/l	-	
Free Carbon Dioxide	mg/l	6	
Dissolved Oxygen	mg/l	-	
TDS	mg/l	-	
Others Bicarbonate s	MgCaCO <sub>3</sub> /l	350	

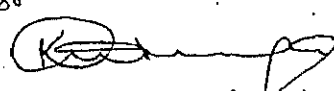
COMMENTS: For research

0.180

WATER QUALITY LABORATORY  
P.O. BOX 30521, NAIROBI

for:

I -170

  
K.W. Mwangi (Mrs)  
Senior Chemist  
Water Quality Laboratory  
MINISTRY OF WATER DEVELOPMENT  
NAIROBI.



# MINISTRY OF WATER DEVELOPMENT

## Water Quality and Pollution Control Laboratory

Tel. No. 557088, Ext. 93  
P.O. Box 30521  
NAIROBI.

Date 18th Dec., 1990

### WATER ANALYSIS REPORT

Sample No. 1362  
Source B/H - C 4573, Dinb Gombo (Marsabit) ✓  
Date of Sampling 30-10-90

Date Received 12-11-90  
Submitted by Votex drinking-Box 1766  
Purpose of Sampling Research NBI

PARAMETERS	UNIT	RESULTS	REMARKS
pH	pH Scale	7.3	
Colour	mg pt/l	5	
Turbidity	N.T.U.	2.0	
Permanganate No. (20 min. boiling)	mgO <sub>2</sub> /l	0.4	
Conductivity (25°C)	µS/cm	830	
Iron	mgFe/l	<0.1	
Manganese	mgMn/l	<0.1	
Calcium	mgCa/l	72	
Magnesium	mgMg/l	60	
Sodium	mgNa/l	19	
Potassium	mgK/l	3.6	
Aluminium	mgAl/l	-	
Total Hardness	mgCaCO <sub>3</sub> /l	428	
Total Alkalinity	mgCaCO <sub>3</sub> /l	500	
Chloride mg Cl/l	mgCl/l	66	
Flouride	mgF/l	0.4	
Nitrate	mgN/l	- 0.04	
Nitrite	mgN/l	<0.01	
Ammonia	mgN/l	-	
Total Nitrogen	mgN/l	-	
Sulphate	mgSO <sub>4</sub> /l	1.9	
Orthophosphate	mgP/l	<0.01	
Total Suspended Solids	mg/l	-	
Free Carbon Dioxide	mg/l	-	
Dissolved Oxygen Bicarconate	mg/l	500	
TDS	mg/l	498	
Others			

COMMENTS: For Research purposes

10.3

*M.A. ABIRA*  
M.A. ABIRA (Mrs.)  
Senior Chemist

for: Water Quality Laboratory  
MINISTRY OF WATER DEVELOPMENT  
NAIROBI.

# MINISTRY OF WATER DEVELOPMENT

## Water Quality and Pollution Control Laboratory

Tel. No. 557088, Ext. 93  
P.O. Box 30521  
NAIROBI.

Vortex - Drilling  
P.O. Box 17662, NAIROBI.

Date.....7th Feb. 1991.....

### WATER ANALYSIS REPORT

Sample No.....16.....  
Source B/H - C 4729, Ikanga (Kitui)  
Date of Sampling.....17.12.90.....

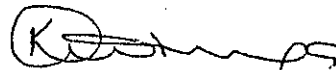
Date Recieved.....2.1.91.....  
Submitted by Vortex - Drilling  
Purpose of Sampling...Res. earch

PARAMETERS	UNIT	RESULTS	REMARKS
pH	pH Scale	8.3	
Colour	mg pt/l	Less than 5	
Turbidity	N.T.U.	0.5	
Permanganate No. (20 min. boiling)	mgO <sub>2</sub> /l	5.5	
Conductivity (25°C)	μS/cm	790	
Iron	mgFe/l	Less than 0.1	
Manganese	mgMn/l	Less than 0.1	
Calcium	mgCa/l	17	
Magnesium	mgMg/l	22	
Sodium	mgNa/l	110	
Potassium	mgK/l	0.3	
Aluminium	mgAl/l	-	
Total Hardness	mgCaCO <sub>3</sub> /l	138	
Total Alkalinity	mgCaCO <sub>3</sub> /l	294	
Chloride mg Cl/l	mgCl/l	61	
Flouride	mgF/l	1.3	
Nitrate	mgN/l	- 5.95	
Nitrite	mgN/l	0.01	
Ammonia	mgN/l	-	
Total Nitrogen	mgN/l	-	
Sulphate	mgSO <sub>4</sub> /l	43	
Orthophosphate	mgP/l	Less than 0.01	
Total Suspended Solids	mg/l	-	
Free Carbon Dioxide	mg/l	-	
Dissolved Oxygen	mg/l	-	
TDS	mg/l	474	
Others <u>Bicarbonates</u>	mgCaCO <sub>3</sub> /l	294	

#### COMMENTS:

For rese arch

0.258



K.W. Mwangi (Mrs)

for: Senior Chemist  
Water Quality Laboratory  
MINISTRY OF WATER DEVELOPMENT  
NAIROBI.

WATER QUALITY LABORATORY  
P.O. BOX 30521, NAIROBI I -172

# MINISTRY OF WATER DEVELOPMENT

## Water Quality and Pollution Control Laboratory

Tel. No. 557088, Ext. 93  
P.O. Box 30521  
NAIROBI.

Vortex - drilling  
P.O. Box 17662,  
NAIROBI.

Date.....7th, February, 1991

### WATER ANALYSIS REPORT

Sample No.....19.....  
Source.....B/H - C. 5278, Mutumyi (Narok)  
Date of Sampling.....22.12.90.....

Date Recieved.....2.1.91.....  
Submitted by.....Vortex.....  
Purpose of Sampling.....Research.....

PARAMETERS	UNIT	RESULTS	REMARKS
pH	pH Scale	8.7	
Colour	mg pt/l	Less than 5	
Turbidity	N.T.U.	0.8	
Permanganate No. (20 min. boiling)	mgO <sub>2</sub> /l	13	
Conductivity (25°C)	µS/cm	2,350	
Iron	mgFe/l	Less than 0.1	
Manganese	mgMn/l	Less than 0.1	
Calcium	mgCa/l	2.4	
Magnesium	mgMg/l	3.9	
Sodium	mgNa/l	684	
Potassium	mgK/l	19	
Aluminium	mgAl/l	-	
Total Hardness	mgCaCO <sub>3</sub> /l	22	
Total Alkalinity	mgCaCO <sub>3</sub> /l	1,100	
Chloride mg Cl/l	mgCl/l	167	
Flouride	mgF/l	2.0	
Nitrate	mgN/l	- 0.00	
Nitrite	mgN/l	Less than 0.01	
Ammonia	mgN/l	-	
Total Nitrogen	mgN/l	-	
Sulphate	mgSO <sub>4</sub> /l	83	
Orthophosphate	mgP/l	Less than 0.01	
Total Suspended Solids	mg/l	-	
Free Carbon Dioxide	mg/l	Nil	
Dissolved Oxygen	mg/l	-	
TDS	mg/l	-	
Others Carbonates	mgCaCO <sub>3</sub> /l	76	

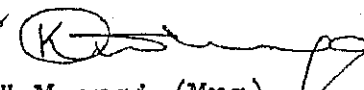
COMMENTS: Bicarbonates MgCaCO<sub>3</sub>/l 1,024

For research

WATER QUALITY LABORATORY  
P.O. BOX 30521, NAIROBI

for:

I -173

02/7   
K.W. Mwangi (Mrs)

Senior Chemist  
Water Quality Laboratory  
MINISTRY OF WATER DEVELOPMENT  
NAIROBI.

# MINISTRY OF WATER DEVELOPMENT

## Water Quality and Pollution Control Laboratory

Tel. No. 557088, Ext. 93  
P.O. Box 30521  
NAIROBI.

Date 18-12-90

### WATER ANALYSIS REPORT

Sample No. 1364  
Source B/H. C. 5627 Kaaling (Turkana)  
Date of Sampling 3-11-90

Date Received 12-11-90  
Submitted by Vortex Drilling-Box  
NB1  
Purpose of Sampling Research

PARAMETERS	UNIT	RESULTS	REMARKS
pH	pH Scale	8.5	
Colour	mg pt/l	<5	
Turbidity	N.T.U.	1.0	
Permanganate No. (20 min. boiling)	mgO <sub>2</sub> /l	0.4	
Conductivity (25°C)	μS/cm	930	
Iron	mgFe/l	0.1	
Manganese	mgMn/l	<0.1	
Calcium	mgCa/l	43	
Magnesium	mgMg/l	29	
Sodium	mgNa/l	13	
Potassium	mgK/l	1.0	
Aluminium	mgAl/l	-	
Total Hardness	mgCaCO <sub>3</sub> /l	226	
Total Alkalinity	mgCaCO <sub>3</sub> /l	408	
Chloride mg Cl/l	mgCl/l	84	
Flouride	mgF/l	0.4	
Nitrate	mgN/l	- 0.54	
Nitrite	mgN/l	<0.01	
Ammonia	mgN/l	-	
Total Nitrogen	mgN/l	-	
Sulphate	mgSO <sub>4</sub> /l	19	
Orthophosphate	mgP/l	<0.01	
Total Suspended Solids	mg/l	-	
Free Carbon Dioxide	mg/l	-	
<del>0.884</del> Carbonate	mg/l CaCO <sub>3</sub>	88	
TDS	mg/l	558	
<del>0.884</del> Bicarbonate	mg/l CaCO <sub>3</sub>	320	

COMMENTS:

For research purposes

14.5

*M. A. Abira*

# MINISTRY OF WATER DEVELOPMENT

## Water Quality and Pollution Control Laboratory

Tel. No. 557088, Ext. 93  
P.O. Box 30521  
NAIROBI.

Vortex Drilling,  
P.O. Box 17662, NAIROBI.

Date 7th Feb. 1991

### WATER ANALYSIS REPORT

Sample No. 12  
Source B/H- C - 5795, Habaswein (Wajir)  
Date of Sampling 4.12.90

Date Recieved 2.1.91  
Submitted by Vortex - Drilling  
Purpose of Sampling Research

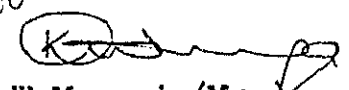
PARAMETERS	UNIT	RESULTS	REMARKS
pH	pH Scale	8.2	
Colour	mg pt/l	Less than <del>5</del> 5	
Turbidity	N.T.U.	0.5	
Permanganate No. (20 min. boiling)	mgO <sub>2</sub> /l	0.8	
Conductivity (25°C)	μS/cm	900	
Iron	mgFe/l	Less than 0.1	
Manganese	mgMn/l	Less than 0.1	
Calcium	mgCa/l	23	
Magnesium	mgMg/l	19	
Sodium	mgNa/l	132	
Potassium	mgK/l	17	
Aluminium	mgAl/l	-	
Total Hardness	mgCaCO <sub>3</sub> /l	136	
Total Alkalinity	mgCaCO <sub>3</sub> /l	464	
Chloride mg Cl/l	mgCl/l	42	
Flouride	mgF/l	1.5	
Nitrate	mgN/l	- 1.176	
Nitrite	mgN/l	Less than 0.01	
Ammonia	mgN/l	-	
Total Nitrogen	mgN/l	-	
Sulphate	mgSO <sub>4</sub> /l	32	
Orthophosphate	mgP/l	Less than 0.01	
Total Suspended Solids	mg/l	-	
Free Carbon Dioxide	mg/l	12	
Dissolved Oxygen	mg/l	-	
TDS	mg/l	-	
Others Bicarbonat es	mgCaCO <sub>3</sub> /l	464	

COMMENTS: For research

WATER QUALITY LABORATORY  
P.O. BOX 30521, NAIROBI

for:

I -175

0.00  
  
K.W. Mwangi (Mrs)  
Senior Chemist  
Water Quality Laboratory  
MINISTRY OF WATER DEVELOPMENT  
NAIROBI.

# MINISTRY OF WATER DEVELOPMENT

## Water Quality and Pollution Control Laboratory

Tel. No. 557088, Ext. 93  
P.O. Box 30521  
NAIROBI.

Vortex - Drilling,  
P.O. Box 17662, NAIROBI.

Date 7th Feb. 1991

### WATER ANALYSIS REPORT

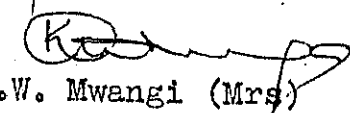
Sample No. 24  
Source B/H...C...5894, Isinya (Kajiado)  
Date of Sampling 4.1.91

Date Received 7.1.91  
Submitted by Vortex...Drilling  
Purpose of Sampling Research

PARAMETERS	UNIT	RESULTS	REMARKS
pH	pH Scale	8.1	
Colour	mg pt/l	Less than 5	
Turbidity	N.T.U.	2.0	
Permanganate No. (20 min. boiling)	mgO <sub>2</sub> /l	1.2	
Conductivity (25°C)	μS/cm	880	
Iron	mgFe/l	0.3	
Manganese	mgMn/l	Less than 0.1	
Calcium	mgCa/l	59	
Magnesium	mgMg/l	56	
Sodium	mgNa/l	110	
Potassium	mgK/l	15	
Aluminium	mgAl/l	-	
Total Hardness	mgCaCO <sub>3</sub> /l	376	
Total Alkalinity	mgCaCO <sub>3</sub> /l	326	
Chloride mg Cl/l	mgCl/l	80	
Flouride	mgF/l	2.0	
Nitrate	mgN/l	- /9.7/	
Nitrite	mgN/l	Less than 0.01	
Ammonia	mgN/l	-	
Total Nitrogen	mgN/l	-	
Sulphate	mgSO <sub>4</sub> /l	47	
Orthophosphate	mgP/l	Less than 0.01	
Total Suspended Solids	mg/l	-	
Free Carbon Dioxide	mg/l	38	
Dissolved Oxygen	mg/l	-	
TDS	mg/l	528	
Others Bicarbonates	mgCaCO <sub>3</sub> /l	326	

COMMENTS: For rese arch

**WATER QUALITY LABORATORY**  
P.O. BOX 30521, NAIROBI

0.384  
  
for: **K.W. Mwangi (Mrs)**  
Senior Chemist  
Water Quality Laboratory  
**MINISTRY OF WATER DEVELOPMENT**  
NAIROBI.

# MINISTRY OF WATER DEVELOPMENT

## Water Quality and Pollution Control Laboratory

Tel. No. 557088, Ext. 93  
P.O. Box 30521  
NAIROBI.

Vortex Drilling,  
P.O. Box 17662,  
NAIROBI.

Date.....21.2.1991.....

### WATER ANALYSIS REPORT

Sample No.....61.....  
Source.....B/H.....C.....6072, Khosla farm (Kilifi)  
Date of Sampling.....15.1.91.....

Date Recieved.....25.1.91.....  
Submitted by.....Vortex drilling  
Purpose of Sampling.....Research

PARAMETERS	UNIT	RESULTS	REMARKS
pH	pH Scale	7.6	
Colour	mg pt/l	Less than 5	
Turbidity	N.T.U.	0.2	
Permanganate No. (20 min. boiling)	mgO <sub>2</sub> /l	9.9	
Conductivity (25°C)	μS/cm	1,160	
Iron	mgFe/l	Less than 0.1	
Manganese	mgMn/l	Less than 0.1	
Calcium	mgCa/l	91	
Magnesium	mgMg/l	22	
Sodium	mgNa/l	158	
Potassium	mgK/l	8.4	
Aluminium	mgAl/l	-	
Total Hardness	mgCaCO <sub>3</sub> /l	320	
Total Alkalinity	mgCaCO <sub>3</sub> /l	194	
Chloride mg Cl/l	mgCl/l	240	
Flouride	mgF/l	0.8	
Nitrate	mgN/l	-2.0	
Nitrite	mgN/l	Less than 0.01	
Ammonia	mgN/l	-	
Total Nitrogen	mgN/l	-	
Sulphate	mgSO <sub>4</sub> /l	20	
Orthophosphate	mgP/l	Less than 0.01	
Total Suspended Solids	mg/l	-	
Free Carbon Dioxide	mg/l	120	
Dissolved Oxygen	mg/l	-	
TDS	mg/l	696	
Others Bicarbonate	mgCaCO <sub>3</sub> /l	194	

COMMENTS: For research

0.137 

WATER QUALITY LABORATORY  
P.O. BOX 30521, NAIROBI

for:

I -177

M.A. Abira (Mrs)

Senior Chemist  
Water Quality Laboratory

MINISTRY OF WATER DEVELOPMENT  
NAIROBI.

# MINISTRY OF WATER DEVELOPMENT

## Water Quality and Pollution Control Laboratory

Tel. No. 557088, Ext. 93  
P.O. Box 30521  
NAIROBI.

Vortex - drilling  
P.O. Box 17662, NAIROBI

Date 22.1.91

### WATER ANALYSIS REPORT

Sample No. 1499  
Source B/H - C 6084, Elwak (Mandera)  
Date of Sampling 21.11.90

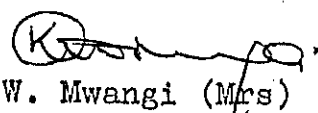
Date Recieved 5.12.90  
Submitted by Vortex - Drilling  
Purpose of Sampling Domestic

PARAMETERS	UNIT	RESULTS	REMARKS
pH	pH Scale	7.2	
Colour	mg pt/l	Less than 5	
Turbidity	N.T.U.	2.0	
Permanganate No. (20 min. boiling)	mgO <sub>2</sub> /l	0.4	
Conductivity (25°C)	µS/cm	2800	
Iron	mgFe/l	Less than 0.1	
Manganese	mgMn/l	Less than 0.1	
Calcium	mgCa/l	633	
Magnesium	mgMg/l	131	
Sodium	mgNa/l	287	
Potassium	mgK/l	113	
Aluminium	mgAl/l	-	
Total Hardness	mgCaCO <sub>3</sub> /l	2120	
Total Alkalinity	mgCaCO <sub>3</sub> /l	260	
Chloride mg Cl/l	mgCl/l	378	
Flouride	mgF/l	2.0	
Nitrate	mgN/l	- 0.1	
Nitrite	mgN/l	Less than 0.01	
Ammonia	mgN/l	-	
Total Nitrogen	mgN/l	-	
Sulphate	mgSO <sub>4</sub> /l	165	
Orthophosphate	mgP/l	Less than 0.01	
Total Suspended Solids	mg/l	-	
Free Carbon Dioxide	mg/l	36	
Dissolved Oxygen	mg/l	-	
TDS	mg/l	1680	
Others CO <sub>3</sub>	mgCaCO <sub>3</sub> /l	260	

COMMENTS: For research

for:

I -178

  
 K.W. Mwangi (Mrs)  
 Senior Chemist  
 Water Quality Laboratory  
 MINISTRY OF WATER DEVELOPMENT  
 NAIROBI.



# MINISTRY OF WATER DEVELOPMENT

## Water Quality and Pollution Control Laboratory

Tel. No. 557088, Ext. 93  
P.O. Box 30521  
NAIROBI.

Vortex Drilling,  
P.O. Box 32 17662,  
NAIROBI.

Date.....~~15~~.....7th February, 1991

### WATER ANALYSIS REPORT

Sample No. 41  
Source.....B/H - C. 6498, Mwena (Kwale)  
Date of Sampling.....12.1.91

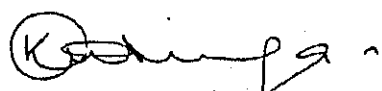
Date Received.....15.1.91  
Submitted by.....Vortex - Drilling  
Purpose of Sampling.....Research

PARAMETERS	UNIT	RESULTS	REMARKS
pH	pH Scale	7.6	
Colour	mg pt/l	40	
Turbidity	N.T.U.	76	
Permanganate No. (20 min. boiling)	mgO <sub>2</sub> /l	2.4	
Conductivity (25°C)	μS/cm	4,800	
Iron	mgFe/l	2.0	
Manganese	mgMn/l	Less than 0.1	
Calcium	mgCa/l	473	
Magnesium	mgMg/l	138	
Sodium	mgNa/l	331	
Potassium	mgK/l	15	
Aluminium	mgAl/l	-	
Total Hardness	mgCaCO <sub>3</sub> /l	1,750	
Total Alkalinity	mgCaCO <sub>3</sub> /l	390	
Chloride mg Cl/l	mgCl/l	1,695	
Fluoride	mgF/l	0.2	
Nitrate	mgN/l	5.7	
Nitrite	mgN/l	0.01	
Ammonia	mgN/l	-	
Total Nitrogen	mgN/l	-	
Sulphate	mgSO <sub>4</sub> /l	67	
Orthophosphate	mgP/l	0.06	
Total Suspended Solids	mg/l	-	
Free Carbon Dioxide	mg/l	30	
Dissolved Oxygen	mg/l	-	
TDS	mg/l	2,880	
Others Bicarbonates	mgCaCO <sub>3</sub> /l	390	

COMMENTS: For research

WATER QUALITY LABORATORY  
P.O. BOX 30521, NAIROBI

for:

  
K.W. Mwangi (Mrs)

Senior Chemist  
Water Quality Laboratory

MINISTRY OF WATER DEVELOPMENT  
NAIROBI.

# MINISTRY OF WATER DEVELOPMENT

## Water Quality and Pollution Control Laboratory

Tel. No. 557088, Ext. 93  
P.O. Box 30521  
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P.O. Box 17662,  
NAIROBI.

Date.....21.2.1991.....

### WATER ANALYSIS REPORT

Sample No.....74..... Date Recieved.....28.1.91.....  
Source.....B/H @ C.6507 - Kasigeni Primary School..... Submitted by.....Vortex Drilling.....  
Date of Sampling.....17.1.91..... Purpose of Sampling.....Research.....

PARAMETERS	UNIT	RESULTS	REMARKS
pH	pH Scale	7.2	
Colour	mg pt/l	Less than 5	
Turbidity	N.T.U.	3	
Permanganate No. (20 min. boiling)	mgO <sub>2</sub> /l	0.4	
Conductivity (25°C)	µS/cm	3,200	
Iron	mgFe/l	2.0	
Manganese	mgMn/l	Less than 0.1	
Calcium	mgCa/l	184	
Magnesium	mgMg/l	150	
Sodium	mgNa/l	452	
Potassium	mgK/l	4.5	
Aluminium	mgAl/l	-	
Total Hardness	mgCaCO <sub>3</sub> /l	1,080	
Total Alkalinity	mgCaCO <sub>3</sub> /l	516	
Chloride mg Cl/l	mgCl/l	780	
Flouride	mgF/l	1.0	
Nitrate	mgN/l	- 0.44	
Nitrite	mgN/l	Less than 0.01	
Ammonia	mgN/l	-	
Total Nitrogen	mgN/l	-	
Sulphate	mgSO <sub>4</sub> /l	Less than 0.3	
Orthophosphate	mgP/l	Less than 0.01	
Total Suspended Solids	mg/l	-	
Free Carbon Dioxide	mg/l	108	
Dissolved Oxygen	mg/l	-	
TDS	mg/l	1,920	
Others Bicarbonates	mgCaCO <sub>3</sub> /l	516	

COMMENTS: For research

0.058

WATER QUALITY LABORATORY  
P.O. BOX 30521, NAIROBI

for:

M.A. Abira (Mrs)  
Senior Chemist  
Water Quality Laboratory  
MINISTRY OF WATER DEVELOPMENT  
NAIROBI.

# MINISTRY OF WATER DEVELOPMENT

## Water Quality and Pollution Control Laboratory

Tel. No. 557088, Ext. 93 Vortex - Drilling,  
P.O. Box 30521 P.O. Box 17662, NAIROBI.  
NAIROBI.

Date 7th Feb. 1991

### WATER ANALYSIS REPORT

Sample No. 18  
Source B/H - C. 6975. (Kima (Machakos))  
Date of Sampling 21.12.90

Date Recieved 2.1.91  
Submitted by Vortex - Drilling  
Purpose of Sampling Res earch

PARAMETERS	UNIT	RESULTS	REMARKS
pH	pH Scale	7.3	
Colour	mg pt/l	5	
Turbidity	N.T.U.	15	
Permanganate No. (20 min. boiling)	mgO <sub>2</sub> /l	3.2	
Conductivity (25°C)	μS/cm	1,750	
Iron	mgFe/l	0.8	
Manganese	mgMn/l	0.1	
Calcium	mgCa/l	172	
Magnesium	mgMg/l	153	
Sodium	mgNa/l	154	
Potassium	mgK/l	21	
Aluminium	mgAl/l	-	
Total Hardness	mgCaCO <sub>3</sub> /l	1,062	
Total Alkalinity	mgCaCO <sub>3</sub> /l	334	
Chloride mg Cl/l	mgCl/l	126	
Flouride	mgF/l	0.7	
Nitrate	mgN/l	- 0.50	
Nitrite	mgN/l	Less than 0.01	
Ammonia	mgN/l	-	
Total Nitrogen	mgN/l	-	
Sulphate	mgSO <sub>4</sub> /l	358	
Orthophosphate	mgP/l	Less than 0.01	
Total Suspended Solids	mg/l	-	
Free Carbon Dioxide	mg/l	42	
Dissolved Oxygen	mg/l	-	
TDS	mg/l	1,050	
Others Bicarbonates	mgCaCO <sub>3</sub> /l	334	

COMMENTS: For res earch

**WATER QUALITY LABORATORY**  
P.O. BOX 30521. NAIROBI

for:

0.344  
  
K.W. Mwangi (Mrs)

Senior Chemist

Water Quality Laboratory

**MINISTRY OF WATER DEVELOPMENT**  
NAIROBI.

# MINISTRY OF WATER DEVELOPMENT

## Water Quality and Pollution Control Laboratory

Tel. No. 557088, Ext. 93  
P.O. Box 30521  
NAIROBI.

Date.....18-12-90.....

### WATER ANALYSIS REPORT

Sample No.....1446.....  
Source B/H- C7064, South Kabras (Kakamega) ✓  
Date of Sampling.....20-11-90.....

Date Received.....26-11-90.....  
Submitted by Vortex drilling.. Box  
Purpose of Sampling.....17662, NBI  
Research

PARAMETERS	UNIT	RESULTS	REMARKS
pH	pH Scale	6.1	
Colour	mg pt/l	<5	
Turbidity	N.T.U.	4.5	
Permanganate No. (20 min. boiling)	mgO <sub>2</sub> /l	2.0	
Conductivity (25°C)	μS/cm	87	
Iron	mgFe/l	<0.1	
Manganese	mgMn/l	<0.1	
Calcium	mgCa/l	4.8	
Magnesium	mgMg/l	3.4	
Sodium	mgNa/l	7.4	
Potassium	mgK/l	2.4	
Aluminium	mgAl/l	-	
Total Hardness	mgCaCO <sub>3</sub> /l	26	
Total Alkalinity	mgCaCO <sub>3</sub> /l	68	
Chloride mg Cl/l	mgCl/l	1.0	
Flouride	mgF/l	<0.1	
Nitrate	mgN/l	- 12.86	
Nitrite	mgN/l	<0.01	
Ammonia	mgN/l	-	
Total Nitrogen	mgN/l	-	
Sulphate	mgSO <sub>4</sub> /l	0.7	
Orthophosphate	mgP/l	<0.01	
Total Suspended Solids	mg/l	-	
Free Carbon Dioxide	mg/l	-	
Dissolved Oxygen	mg/l	-	
TDS	mg/l	52	
Others Bicarbonate	mg/l CaCO <sub>3</sub>	68	

#### COMMENTS:

For research purposes

36.0

I -182  
WATER QUALITY LABORATORY  
P.O. BOX 30521, NAIROBI

for: M.A. Abira (Mrs)  
Senior Chemist  
Water Quality Laboratory  
MINISTRY OF WATER DEVELOPMENT  
NAIROBI.

# MINISTRY OF WATER DEVELOPMENT

## Water Quality and Pollution Control Laboratory

Tel. No. 557088, Ext. 93  
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NAIROBI.

Vortex drilling,  
P.O. Box 17662,  
NAIROBI.

Date.....7th. Feb. 1991.....

### WATER ANALYSIS REPORT

Sample No. 20  
Source B/H - C. 7451, Ndabibi (Nakuru)  
Date of Sampling 27.12.90

Date Recieved 2.1.90  
Submitted by Vortex - drillin  
Purpose of Sampling Research.

PARAMETERS	UNIT	RESULTS	REMARKS
pH	pH Scale	8.8	
Colour	mg pt/l	Less than 5	
Turbidity	N.T.U.	0.7	
Permanganate No. (20 min. boiling)	mgO <sub>2</sub> /l	7.9	
Conductivity (25°C)	μS/cm	770	
Iron	mgFe/l	0.1	
Manganese	mgMn/l	Less than 0.1	
Calcium	mgCa/l	14	
Magnesium	mgMg/l	5.8	
Sodium	mgNa/l	176	
Potassium	mgK/l	9.8	
Aluminium	mgAl/l	-	
Total Hardness	mgCaCO <sub>3</sub> /l	60	
Total Alkalinity	mgCaCO <sub>3</sub> /l	400	
Chloride mg Cl/l	mgCl/l	18	
Flouride	mgF/l	2.0	
Nitrate	mgN/l	-	0.84✓
Nitrite	mgN/l	Less than 0.01	
Ammonia	mgN/l	-	
Total Nitrogen	mgN/l	-	
Sulphate	mgSO <sub>4</sub> /l	Less than 0.3	
Orthophosphate	mgP/l	Less than 0.01	
Total Suspended Solids	mg/l	-	
Free Carbon Dioxide	mg/l	Nil	
Dissolved Oxygen	mg/l	-	
TDS	mg/l	-	
Others Carbonates	mgCaCO <sub>3</sub> /l	36	

COMMENTS: Bicarbonates Mg Ca CO<sub>3</sub> /l 364

For Research

WATER QUALITY LABORATORY  
P.O. BOX 30521, NAIROBI

for:

K.W. Mwangi (Mrs)

Senior Chemist

Water Quality Laboratory

MINISTRY OF WATER DEVELOPMENT  
NAIROBI.

# MINISTRY OF WATER DEVELOPMENT

## Water Quality and Pollution Control Laboratory

Tel. No. 557088, Ext. 93  
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NAIROBI.

P.O. Box 17662,  
NAIROBI.

Date.....22nd.1.1991.....

### WATER ANALYSIS REPORT

Sample No. 1511  
Source.....B/H - C- 7581, Nyadiere Primary school  
(South Nyenza)  
Date of Sampling.....3.12.90

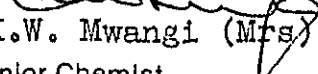
Date Recieved.....6.12.90  
Submitted by.....Vortex drilling  
Purpose of Sampling.....Domestic

PARAMETERS	UNIT	RESULTS	REMARKS
pH	pH Scale	8.0	
Colour	mg pt/l	Less than 5	
Turbidity	N.T.U.	1.0	
Permanganate No. (20 min. boiling)	mgO <sub>2</sub> /l	0.4	
Conductivity (25° C)	μS/cm	700	
Iron	mgFe/l	Less than 0.1	
Manganese	mgMn/l	Less than 0.1	
Calcium	mgCa/l	70 <del>7.0</del>	
Magnesium	mgMg/l	45	
Sodium	mgNa/l	91	
Potassium	mgK/l	4.7	
Aluminium	mgAl/l	-	
Total Hardness	mgCaCO <sub>3</sub> /l	358	
Total Alkalinity	mgCaCO <sub>3</sub> /l	572	
Chloride mg Cl/l	mgCl/l	11	
Flouride	mgF/l	2.0	
Nitrate	mgN/l	- 0.0	
Nitrite	mgN/l	Less than 0.01	
Ammonia	mgN/l	-	
Total Nitrogen	mgN/l	-	
Sulphate	mgSO <sub>4</sub> /l	6.4	
Orthophosphate	mgP/l	Less than 0.01	
Total Suspended Solids	mg/l	-	
Free Carbon Dioxide	mg/l	40	
Dissolved Oxygen	mg/l	-	
TDS	mg/l	-	
Others			

COMMENTS: For research

for:

I -184

27.2  
  
K.W. Mwangi (Mrs)  
Senior Chemist  
Water Quality Laboratory  
MINISTRY OF WATER DEVELOPMENT  
NAIROBI.

# MINISTRY OF WATER DEVELOPMENT

## Water Quality and Pollution Control Laboratory

Tel. No. 557088, Ext. 93  
P.O. Box 30521  
NAIROBI.

P.O. Box 17662,  
NAIROBI.

Date.....22.1.91.....

### WATER ANALYSIS REPORT

Sample No.....1500.....

Date Recieved.....5.12.90.....

Source.....B/H...C...7804...Solola Primary Sch,

Submitted by.....Vortex.....Drillir

Date of Sampling.....( Marsabit)

Purpose of Sampling.....Domestic.....

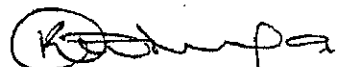
22.11.90

PARAMETERS	UNIT	RESULTS	REMARKS
pH	pH Scale	7.7	
Colour	mg pt/l	20	
Turbidity	N.T.U.	95	
Permanganate No. (20 min. boiling)	mgO <sub>2</sub> /l	1.2	
Conductivity (25°C)	µS/cm	1280	
Iron	mgFe/l	2.0	
Manganese	mgMn/l	Less than 0.1	
Calcium	mgCa/l	54	
Magnesium	mgMg/l	51	
Sodium	mg/Na/l	287	
Potassium	mgK/l	3.0	
Aluminium	mgAl/l	-	
Total Hardness	mgCaCO <sub>3</sub> /l	342	
Total Alkalinity	mgCaCO <sub>3</sub> /l	510	
Chloride mg Cl/l	mgCl/l	218	
Flouride	mgF/l	1.5	
Nitrate	mgN/l	- 0.76	
Nitrite	mgN/l	Less than 0.01	
Ammonia	mgN/l	-	
Total Nitrogen	mgN/l	-	
Sulphate	mgSO <sub>4</sub> /l	95	
Orthophosphate	mgP/l	Less than 0.01	
Total Suspended Solids	mg/l	-	
Free Carbon Dioxide	mg/l	20	
Dissolved Oxygen	mg/l	-	
TDS	mg/l	768	
Others CO <sub>3</sub>	mgcacO <sub>3</sub> /l	510	

COMMENTS:

For Research

27.2



K.W. Mwangi (Mrs)  
Senior Chemist

Water Quality Laboratory

MINISTRY OF WATER DEVELOPMENT  
NAIROBI.

# MINISTRY OF WATER DEVELOPMENT

## Water Quality and Pollution Control Laboratory

Tel. No. 557088, Ext. 93  
P.O. Box 30521  
NAIROBI.

Date 18-12-90

### WATER ANALYSIS REPORT

Sample No. 1409  
Source B/H - C 7878 Mwanda Prv sch. (Bungoma) ✓  
Date of Sampling 9-11-90

Date Received 20-11-90  
Submitted by Vortex drilling-Box  
Purpose of Sampling 17662 NBI Research

PARAMETERS	UNIT	RESULTS	REMARKS
pH	pH Scale	7.2	
Colour	mg pt/l	<5	
Turbidity	N.T.U.	2.1	
Permanganate No. (20 min. boiling)	mgO <sub>2</sub> /l	0.4	
Conductivity (25°C)	μS/cm	250	
Iron	mgFe/l	<0.1	
Manganese	mgMn/l	<0.1	
Calcium	mgCa/l	23	
Magnesium	mgMg/l	6.8	
Sodium	mgNa/l	25	
Potassium	mgK/l	2.3	
Aluminium	mgAl/l	-	
Total Hardness	mgCaCO <sub>3</sub> /l	86	
Total Alkalinity	mgCaCO <sub>3</sub> /l	150	
Chloride mg Cl/l	mgCl/l	4	
Flouride	mgF/l	<0.1	
Nitrate	mgN/l	- 0.05	
Nitrite	mgN/l	-	
Ammonia	mgN/l	-	
Total Nitrogen	mgN/l	-	
Sulphate	mgSO <sub>4</sub> /l	<0.3	
Orthophosphate	mgP/l	-	
Total Suspended Solids	mg/l	-	
Free Carbon Dioxide	mg/l	-	
Dissolved Oxygen	mg/l	-	
TDS	mg/l	-	
Chloride & Bicarbonate	mg/l CaCO <sub>3</sub>	150	

COMMENTS:

For Research purposes

12-8

*M. A. Abira*

for: M. A. Abira (Mrs)  
Senior Chemist  
Water Quality Laboratory  
MINISTRY OF WATER DEVELOPMENT  
NAIROBI.

I -186

WATER QUALITY LABORATORY  
P.O. BOX 30521, NAIROBI



# MINISTRY OF WATER DEVELOPMENT

## Water Quality and Pollution Control Laboratory

Tel. No. 557088, Ext. 93  
P.O. Box 30521  
NAIROBI.

P.O. Box 17662,  
NAIROBI.

Date..... 22.1.91

### WATER ANALYSIS REPORT

Sample No..... 1510  
Source..... B/H - C 8062, Rabuor chiefs camp  
Date of Sampling..... 28.11.90 (Kisumu)

Date Recieved..... 6.2.90  
Submitted by..... Vortex drilling  
Purpose of Sampling..... Domestic

PARAMETERS	UNIT	RESULTS	REMARKS
pH	pH Scale	7.8	
Colour	mg pt/l	Less than 5	
Turbidity	N.T.U.	5.5	
Permanganate No. (20 min. boiling)	mgO <sub>2</sub> /l	1.2	
Conductivity (25°C)	µS/cm	990	
Iron	mgFe/l	Less than 0.1	
Manganese	mgMn/l	Less than 0.1	
Calcium	mgCa/l	49	
Magnesium	mgMg/l	18	
Sodium	mgNa/l	2.20	
Potassium	mgK/l	27	
Aluminium	mgAl/l	-	
Total Hardness	mgCaCO <sub>3</sub> /l	194	
Total Alkalinity	mgCaCO <sub>3</sub> /l	648	
Chloride mg Cl/l	mgCl/l	34	
Flouride	mgF/l	2.0	
Nitrate	mgN/l	- 0.1	
Nitrite	mgN/l	Less than 0.01	
Ammonia	mgN/l	-	
Total Nitrogen	mgN/l	-	
Sulphate	mgSO <sub>4</sub> /l	61	
Orthophosphate	mgP/l	Less than 0.01	
Total Suspended Solids	mg/l	-	
Free Carbon Dioxide	mg/l	36	
Dissolved Oxygen	mg/l	-	
TDS	mg/l	-	
Others			

COMMENTS: For Research

# MINISTRY OF WATER DEVELOPMENT

## Water Quality and Pollution Control Laboratory

Tel. No. 557088, Ext. 93  
P.O. Box 30521  
NAIROBI.

P.O. Box 17662,  
NAIROBI.

Date.....21.2.1991.....

### WATER ANALYSIS REPORT

Sample No.....89.....  
Source.....B/H-C.8062, Rabur chief's Camp  
(Nyanza)  
Date of Sampling.....1.2.91.....

Date Recieved.....5.2.91.....  
Submitted by.....Vortex drilling  
Purpose of Sampling.....Research

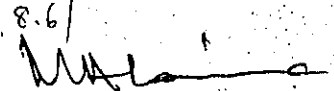
PARAMETERS	UNIT	RESULTS	REMARKS
pH	pH Scale	8.3	
Colour	mg pt/l	5	
Turbidity	N.T.U.	7.4	
Permanganate No. (20 min. boiling)	mgO <sub>2</sub> /l	1.13	
Conductivity (25°C)	µS/cm	1,140	
Iron	mgFe/l	2.0	
Manganese	mgMn/l	Less than 0.1	
Calcium	mgCa/l	49	
Magnesium	mgMg/l	7	
Sodium	mgNa/l	19	
Potassium	mgK/l	4	
Aluminium	mgAl/l	-	
Total Hardness	mgCaCO <sub>3</sub> /l	152	
Total Alkalinity	mgCaCO <sub>3</sub> /l	514	
Chloride mg Cl/l	mgCl/l	33	
Flouride	mgF/l	2.0	
Nitrate	mgN/l	- 0.1100	
Nitrite	mgN/l	Less than 0.01	
Ammonia	mgN/l	-	
Total Nitrogen	mgN/l	-	
Sulphate	mgSO <sub>4</sub> /l	103	
Orthophosphate	mgP/l	Less than 0.01	
Total Suspended Solids	mg/l	-	
Free Carbon Dioxide	mg/l	28	
Dissolved Oxygen	mg/l	-	
TDS	mg/l	684	
Others Bicarbonates	mgCaCO <sub>3</sub> /l	514	

#### COMMENTS:

~~Bicarbonates~~ For research

WATER QUALITY LABORATORY  
P.O. BOX 30521, NAIROBI

for:

8.6/  
  
M.A. Abira (Mrs)  
Senior Chemist  
Water Quality Laboratory  
MINISTRY OF WATER DEVELOPMENT  
NAIROBI.

# MINISTRY OF WATER DEVELOPMENT

## Water Quality and Pollution Control Laboratory

Tel. No. 557088, Ext. 93  
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NAIROBI.

Vortex Drilling  
P.O. Box 17662, NAIROBI.

7th Feb. 1991  
Date ~~Vortex Drilling~~ 2.1.91

### WATER ANALYSIS REPORT

Sample No. 17  
Source B/H - G. 8298, Keekorik (Narok)  
Date of Sampling 19.12.90

Date Received 2.1.91  
Submitted by Vortex Drilling  
Purpose of Sampling Research

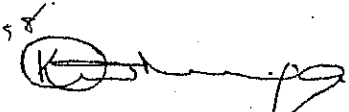
PARAMETERS	UNIT	RESULTS	REMARKS
pH	pH Scale	6.4	
Colour	mg pt/l	Less than 5	
Turbidity	N.T.U.	0.5	
Permanganate No. (20 min. boiling)	mgO <sub>2</sub> /l	4.7	
Conductivity (25°C)	μS/cm	250	
Iron	mgFe/l	Less than 0.1	
Manganese	mgMn/l	Less than 0.1	
Calcium	mgCa/l	16	
Magnesium	mgMg/l	6.3	
Sodium	mgNa/l	24	
Potassium	mgK/l	8.6	
Aluminium	mgAl/l	-	
Total Hardness	mgCaCO <sub>3</sub> /l	66	
Total Alkalinity	mgCaCO <sub>3</sub> /l	56	
Chloride mg Cl/l	mgCl/l	21	
Flouride	mgF/l	0.8	
Nitrate	mgN/l	- 5.650	
Nitrite	mgN/l	Less than 0.01	
Ammonia	mgN/l	-	
Total Nitrogen	mgN/l	-	
Sulphate	mgSO <sub>4</sub> /l	32	
Orthophosphate	mgP/l	Less than 0.01	
Total Suspended Solids	mg/l	-	
Free Carbon Dioxide	mg/l	70	
Dissolved Oxygen	mg/l	-	
TDS	mg/l	150	
Others Bicarbonates	mgCaCO <sub>3</sub>	56	

COMMENTS: For research

WATER QUALITY LABORATORY  
P.O. BOX 30521 NAIROBI

for:

I -189

b.158  
  
K.W. Mwangi (Mrs)  
Senior Chemist  
Water Quality Laboratory  
MINISTRY OF WATER DEVELOPMENT  
NAIROBI.

# MINISTRY OF WATER DEVELOPMENT

## Water Quality and Pollution Control Laboratory

Tel. No. 557088, Ext. 93  
P.O. Box 30521  
NAIROBI.

Date 18-12-90

### WATER ANALYSIS REPORT

Sample No. 1410  
Source B/H - C8810, Asiriam Prys. sch. (Busia) ✓  
Date of Sampling 13-11-90

Date Received 20-11-90  
Submitted by Vortex drilling Box 17662 NBI  
Purpose of Sampling Research

PARAMETERS	UNIT	RESULTS	REMARKS
pH	pH Scale	6.9	
Colour	mg pt/l	<5	
Turbidity	N.T.U.	1.9	
Permanganate No. (20 min. boiling)	mgO <sub>2</sub> /l	0.4	
Conductivity (25°C)	μS/cm	210	
Iron	mgFe/l	<0.1	
Manganese	mgMn/l	< 0.1	
Calcium	mgCa/l	13	
Magnesium	mgMg/l	7.3	
Sodium	mgNa/l	22	
Potassium	mgK/l	2.0	
Aluminium	mgAl/l	-	
Total Hardness	mgCaCO <sub>3</sub> /l	62	
Total Alkalinity	mgCaCO <sub>3</sub> /l	120	
Chloride mg Cl/l	mgCl/l	14	
Flouride	mgF/l	0.2	
Nitrate	mgN/l	- 0.02	
Nitrite	mgN/l	-	
Ammonia	mgN/l	-	
Total Nitrogen	mgN/l	-	
Sulphate	mgSO <sub>4</sub> /l	<0.3	
Orthophosphate	mgP/l	-	
Total Suspended Solids	mg/l	-	
Free Carbon Dioxide	mg/l	-	
Dissolved Oxygen	mg/l	-	
TDS	mg/l	-	
Other Bicarbonate	mg/l CaCO <sub>3</sub>	120	

#### COMMENTS:

For Research purposes

18.8

I -190  
WATER QUALITY LABORATORY  
P.O. BOX 30521, NAIROBI

for: M.A. Abira (Mrs)  
Senior Chemist  
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# MINISTRY OF WATER DEVELOPMENT

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Tel. No. 557088, Ext. 93  
P.O. Box 30521  
NAIROBI.

P.O. Box 17662,  
NAIROBI.

Date.....22.1.91

### WATER ANALYSIS REPORT

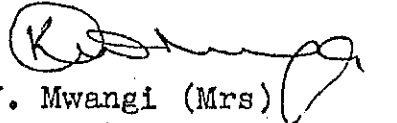
Sample No.....1539  
Source.....B/H - C 8923, Chiakanga (Meru)  
Date of Sampling.....12.12.90

Date Recieved.....17.12.90  
Submitted by.....Vortex drilling  
Purpose of Sampling.....Research

PARAMETERS	UNIT	RESULTS	REMARKS
pH	pH Scale	7.8	
Colour	mg pt/l	20	
Turbidity	N.T.U.	17	
Permanganate No. (20 min. boiling)	mgO <sub>2</sub> /l	0.4	
Conductivity (25°C)	µS/cm	940	
Iron	mgFe/l	0.1	
Manganese	mgMn/l	0.3	
Calcium	mgCa/l	46	
Magnesium	mgMg/l	33	
Sodium	mgNa/l	132	
Potassium	mgK/l	4.9	
Aluminium	mgAl/l	-	
Total Hardness	mgCaCO <sub>3</sub> /l	248	
Total Alkalinity	mgCaCO <sub>3</sub> /l	660	
Chloride mg Cl/l	mgCl/l	16	
Flouride	mgF/l	2.0	
Nitrate	mgN/l	- 0.0	
Nitrite	mgN/l	Less than 0.01	
Ammonia	mgN/l	-	
Total Nitrogen	mgN/l	-	
Sulphate	mgSO <sub>4</sub> /l	25	
Orthophosphate	mgP/l	Less than 0.01	
Total Suspended Solids	mg/l	-	
Free Carbon Dioxide	mg/l	70	
Dissolved Oxygen	mg/l	-	
TDS	mg/l	-	
Others			

COMMENTS: For re search purposes.

28.5



for:

K.W. Mwangi (Mrs)  
Senior Chemist  
Water Quality Laboratory  
MINISTRY OF WATER DEVELOPMENT  
NAIROBI.

# MINISTRY OF WATER DEVELOPMENT

## Water Quality and Pollution Control Laboratory

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NAIROBI.

Vortex - Drilling,  
P.O. Box 17662,  
NAIROBI.

Date.....7th Feb.....1991.....

### WATER ANALYSIS REPORT

Sample No.....39.....  
Source.....B/H.....C-8981, Kanyubara (Embu)  
Date of Sampling.....9.1.91.....

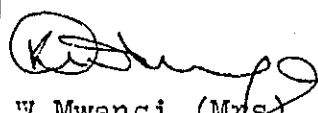
Date Recieved.....15.1.91.....  
Submitted by Vortex Drilling  
Purpose of Sampling.....Research

PARAMETERS	UNIT	RESULTS	REMARKS
pH	pH Scale	6.3	
Colour	mg pt/l	10	
Turbidity	N.T.U.	34	
Permanganate No. (20 min. boiling)	mgO <sub>2</sub> /l	0.8	
Conductivity (25°C)	µS/cm	104	
Iron	mgFe/l	1.0	
Manganese	mgMn/l	Less than 0.1	
Calcium	mgCa/l	2.4	
Magnesium	mgMg/l	2.9	
Sodium	mgNa/l	13	
Potassium	mgK/l	2.5	
Aluminium	mgAl/l	-	
Total Hardness	mgCaCO <sub>3</sub> /l	12	
Total Alkalinity	mgCaCO <sub>3</sub> /l	24	
Chloride mg Cl/l	mgCl/l	12	
Flouride	mgF/l	0.2	
Nitrate	mgN/l	- 14.7	
Nitrite	mgN/l	Less than 0.01	
Ammonia	mgN/l	-	
Total Nitrogen	mgN/l	-	
Sulphate	mgSO <sub>4</sub> /l	0.5	
Orthophosphate	mgP/l	Less than 0.01	
Total Suspended Solids	mg/l	-	
Free Carbon Dioxide	mg/l	38	
Dissolved Oxygen	mg/l	-	
TDS	mg/l	62	
Others Bicarbonates	mgCaCO <sub>3</sub> /l	24	

#### COMMENTS:

For research

WATER QUALITY LABORATORY  
P.O. BOX 30521, NAIROBI

0.11  
  
K.W. Mwangi (Mrs)  
for; Senior Chemist  
Water Quality Laboratory  
MINISTRY OF WATER DEVELOPMENT  
NAIROBI.

# MINISTRY OF WATER DEVELOPMENT

## Water Quality and Pollution Control Laboratory

Tel. No. 557088, Ext. 93  
P.O. Box 30521  
NAIROBI.

P.O. Box 17662,  
NAIROBI.

Date.....21.2.1991.....

### WATER ANALYSIS REPORT

Sample No. 76  
Source..... B/B - C- 9002, Jomo Kenyatta  
Date of Sampling..... International Airport  
25.1.91

Date Recieved..... 28.1.91  
Submitted by..... Vortex drilling  
Purpose of Sampling..... Research

PARAMETERS	UNIT	RESULTS	REMARKS
pH	pH Scale	9.0	
Colour	mg pt/l	Less than 5	
Turbidity	N.T.U.	1.0	
Permanganate No. (20 min. boiling)	mgO <sub>2</sub> /l	0.4	
Conductivity (25°C)	µS/cm	690	
Iron	mgFe/l	Less than 0.1	
Manganese	mgMn/l	Less than 0.1	
Calcium	mgCa/l	2.4	
Magnesium	mgMg/l	0.5	
Sodium	mgNa/l	168	
Potassium	mgK/l	8.4	
Aluminium	mgAl/l	-	
Total Hardness	mgCaCO <sub>3</sub> /l	8	
Total Alkalinity	mgCaCO <sub>3</sub> /l	236	
Chloride mg Cl/l	mgCl/l	62	
Flouride	mgF/l	2.0	
Nitrate	mgN/l	- 0.22/	
Nitrite	mgN/l	Less than 0.01	
Ammonia	mgN/l	-	
Total Nitrogen	mgN/l	-	
Sulphate	mgSO <sub>4</sub> /l	7.8	
Orthophosphate	mgP/l	Less than 0.01	
Total Suspended Solids	mg/l	-	
Free Carbon Dioxide	mg/l	Nil	
Dissolved Oxygen	mg/l	-	
TDS	mg/l	414	
Others Bicarbonates	mgCaCO <sub>3</sub> /l	236	

COMMENTS: ~~For~~ For research

WATER QUALITY LABORATORY  
P.O. BOX 30521, NAIROBI

for:

M.A. Abira (Mrs)

Senior Chemist  
Water Quality Laboratory

MINISTRY OF WATER DEVELOPMENT  
NAIROBI.

# MINISTRY OF WATER DEVELOPMENT

## Water Quality and Pollution Control Laboratory

Tel. No. 557088, Ext. 93  
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P.O. Box 17662,  
NAIROBI.

Date.....21.2.1991.....

### WATER ANALYSIS REPORT

Sample No.....57.....~~9/70~~.....  
Source.....B/H.....C.....~~9/17/1~~.....Munyu (Nyeri)  
Date of Sampling.....19.1.91.....

Date Recieved.....22.1.91.....  
Submitted by.....Vortex Drilling  
Purpose of Sampling.....Research.....

PARAMETERS	UNIT	RESULTS	REMARKS
pH	pH Scale	3.2	
Colour	mg pt/l	250	
Turbidity	N.T.U.	195	
Permanganate No. (20 min. boiling)	mgO <sub>2</sub> /l	0.8	
Conductivity (25°C)	μS/cm	250	
Iron	mgFe/l	3.0	
Manganese	mgMn/l	0.1	
Calcium	mgCa/l	1.6	
Magnesium	mgMg/l	0.4	
Sodium	mgNa/l	58	
Potassium	mgK/l	7.4	
Aluminium	mgAl/l	-	
Total Hardness	mgCaCO <sub>3</sub> /l	6.0	
Total Alkalinity	mgCaCO <sub>3</sub> /l	130	
Chloride mg Cl/l	mgCl/l	5	
Flouride	mgF/l	0.2	
Nitrate	mgN/l	- 27.0	
Nitrite	mgN/l	Less than 0.01	
Ammonia	mgN/l	-	
Total Nitrogen	mgN/l	-	
Sulphate	mgSO <sub>4</sub> /l	2.2	
Orthophosphate	mgP/l	0.04	
Total Suspended Solids	mg/l	-	
Free Carbon Dioxide	mg/l	20	
Dissolved Oxygen	mg/l	-	
TDS	mg/l	150	
Others Carbonates	mgCaCO <sub>3</sub> /l	20	

COMMENTS: Bicarbonates mgCaCO<sub>3</sub>/l 110

For research

WATER QUALITY LABORATORY  
P.O. BOX 30521, NAIROBI

for:

M.A. Abira (Mrs)  
Senior Chemist  
Water Quality Laboratory  
MINISTRY OF WATER DEVELOPMENT  
NAIROBI.



# MINISTRY OF WATER DEVELOPMENT

## Water Quality and Pollution Control Laboratory

Tel. No. 557088, Ext. 93  
P.O. Box 30521  
NAIROBI.

Date...18-12-90.....

### WATER ANALYSIS REPORT

Sample No...1445.....

Source B/H...C9180, Ugunja... (Siaya)..... ✓

Date of Sampling...16-11-90.....

Date Recieved...26-11-90.....

Submitted by...Vortex drilling -Box

17662, NBI

Purpose of Sampling...Research

PARAMETERS	UNIT	RESULTS	REMARKS
pH	pH Scale	6.9	
Colour	mg pt/l	<5	
Turbidity	N.T.U.	1.5	
Permanganate No. (20 min. boiling)	mgO <sub>2</sub> /l	0.4	
Conductivity (25°C)	µS/cm	410	
Iron	mgFe/l	<0.1	
Manganese	mgMn/l	<0.1	
Calcium	mgCa/l	47	
Magnesium	mgMg/l	17	
Sodium	mgNa/l	24	
Potassium	mgK/l	1.3	
Aluminium	mgAl/l	-	
Total Hardness	mgCaCO <sub>3</sub> /l	188	
Total Alkalinity	mgCaCO <sub>3</sub> /l	270	
Chloride mg Cl/l	mgCl/l	1.0	
Flouride	mgF/l	0.2	
Nitrate	mgN/l	- 0.00	
Nitrite	mgN/l	<0.01	
Ammonia	mgN/l	-	
Total Nitrogen	mgN/l	-	
Sulphate	mgSO <sub>4</sub> /l	3.5	
Orthophosphate	mgP/l	<0.01	
Total Suspended Solids	mg/l	-	
Free Carbon Dioxide	mg/l	-	
Dissolved Oxygen	mg/l	-	
TDS	mg/l	246	
Other Bicarbonate	mg/lCaCO <sub>3</sub>	270	

#### COMMENTS:

For Research Purposes

33

for:

M.A. Abira (Mrs)  
Senior Chemist

Water Quality Laboratory

MINISTRY OF WATER DEVELOPMENT  
NAIROBI.

I -195  
WATER QUALITY LABORATORY  
P.O. BOX 30521, NAIROBI

# MINISTRY OF WATER DEVELOPMENT

## Water Quality and Pollution Control Laboratory

Tel. No. 557088, Ext. 93  
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NAIROBI.

Vortex Drilling,  
P.O. Box 17662,  
NAIROBI.

Date...7th...Feb...1991.....

### WATER ANALYSIS REPORT

Sample No.....33.....

Date Recieved.....15.1.91.....

Source.....B/H.....C.....9400, Malindi Prison Kilifi

Submitted by.....Vortex Drilling

Date of Sampling.....5.1.91.....

Purpose of Sampling.....Research

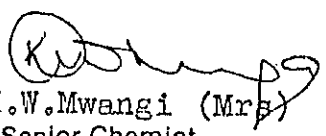
PARAMETERS	UNIT	RESULTS	REMARKS
pH	pH Scale	7.6	
Colour	mg pt/l	Less than 5	
Turbidity	N.T.U.	3.7	
Permanganate No. (20 min. boiling)	mgO <sub>2</sub> /l	3.2	
Conductivity (25°C)	µS/cm	1,650	
Iron	mgFe/l	0.3	
Manganese	mgMn/l	Less than 0.1	
Calcium	mgCa/l	116	
Magnesium	mgMg/l	20	
Sodium	mgNa/l	176	
Potassium	mgK/l	6.3	
Aluminium	mgAl/l	-	
Total Hardness	mgCaCO <sub>3</sub> /l	374	
Total Alkalinity	mgCaCO <sub>3</sub> /l	328	
Chloride mg Cl/l	mgCl/l	343	
Flouride	mgF/l	0.2	
Nitrate	mgN/l	- 14.20	
Nitrite	mgN/l	Less than 0.01	
Ammonia	mgN/l	-	
Total Nitrogen	mgN/l	-	
Sulphate	mgSO <sub>4</sub> /l	90	
Orthophosphate	mgP/l	0.01	
Total Suspended Solids	mg/l	-	
Free Carbon Dioxide	mg/l	32	
Dissolved Oxygen	mg/l	-	
TDS	mg/l	990	
Others Bicarbonate	mgCaCO <sub>3</sub> /l	328	

COMMENTS: For research.

WATER QUALITY LABORATORY  
P.O. BOX 30521, NAIROBI

for:

I -196

  
 K.W. Mwangi (Mr)  
 Senior Chemist  
 Water Quality Laboratory  
 MINISTRY OF WATER DEVELOPMENT  
 NAIROBI.

## **PART II : WELL SURVEY**



## 1. INTRODUCTION

### 1.1 Selection of Well Survey Sites

In total, 587 sites were selected for well survey, being distributed over the country basically in proportion to the number of boreholes in each district. The selection of wells were made through reconnaissance on site and information from District Water Office on the actual condition of boreholes, under assistance/supervision of MOWD or NWCPC engineers. For the selection work, borehole list of each district was prepared based on information in the data base of MOWD. It provided usable information for the selection. Number of wells/boreholes surveyed in each district is given in table 1, and the locations are shown in Figure 1 of Data Book Part 1.

### 1.2 Method of Carrying out Well Survey

The well survey was conducted to cover two (2) components of survey at each borehole.

(1) Groundwater level measurement, including measurements of pH value, electric conductivity and water temperature.

(2) Questionnaire survey on groundwater abstraction. On field, the survey team encountered difficulties in carrying out the survey at many sites owing to unfavourable condition of wells/boreholes (eg. hard-capped borehole heads, clogged holes, etc.). Among others, access to the water level was one of the most difficult operation. Welding equipment, pipe wrench and other tools were used at a number of holes to open the capped borehole heads. These difficulties have obliged to leave some of survey items unmeasured and/or unavailable

### 2.3 Well Survey Data

The well survey data are presented in four (4) tables;

- Data Table 1: Borehole data by well survey.  
General information, location and water quality as revealed from the survey are shown in this table.
- Data Table 2: Owner Information  
Owner's name and address are shown in this table.
- Data Table 3: Pump Information  
Type of pump and production rate are shown in this table.
- Data Table 4: Remarks  
Other information as to current borehole use/situation shown in this table.

Wordings and abbreviations used in the tables are identical to those used in the MOWD's current database, which are described in Table 1.2

Some remarks are also given below for reference to reading of Data Tables 1 to 4.

(1) Pump type (Ref. Data Table 1)

H = Hand pump  
M = Mono lift  
N = Not equipped  
R = Reciprocate  
S = submersible  
W = Wind mill

(2) Elevation (Ref. Data Table 1)

Borehole elevation was measured by altimeters correlating to the point where the altitude is known.

(3) Water level

Some data are quoted from data base of MOWD, and marked in the table.

(4) Others

Unobt = Data unobtainable  
N/k = Not known  
N/a = Not available

**Table 1. 1**                      **Number of B.H. on Well Survey**

PROVINCE	DC CODE	DISTRICT	No.
Central	11	Nairobi	11
	21	Kiambu	7
	22	Kirinyaga	6
	23	Muranga	6
	24	Nyandarua	6
	25	Nyeri	6
Coast	31	Kilifi	34
	32	Kwale	32
	33	Lamu	6
	35	Taita Taveta	35
	36	Tana River	6
Eastern	41	Embu	6
	42	Isiolo	14
	43	Kitui	35
	44	Machakos	22
	45	Marsabit	24
	46	Meru	12
North Eastern	51	Garissa	22
	52	Mandera	15
	53	Wajir	36
Nyanza	61	Kisii	6
	62	Kisumu	6
	63	Siaya	6
	64	South Nyanza	13
RiftValley	71	Baringo	16
	72	Elgeyo Marakwet	6
	73	Kajiado	31
	74	Kericho	4
	75	Laikipia	20
	76	Nakuru	10
	77	Nandi	5
	78	Narok	7
	79	Samburu	34
	81	Trans-Nzoia	6
	82	Turkana	46
	83	Uasin Gishu	6
	84	West Pokot	6
Western	91	Bungoma	6
	92	Busia	6
	93	Kakamega	6
Total			587

Table 1.2 (1/3) Wording and Abbreviation used in Survey Data

---

(1) BORE H/NO Borehole number	:	First number 4 mean C in a data base. 41000 = C1000
(2) LONGITUDE	:	Longitude of borehole to nearest minute
(3) LATITUDE	:	Latitude of borehole to nearest minute
(4) DIRECTION	:	Latitude direction, i.e. a value reported as longitude 3642, latitude 118 and direction S is read 36 degrees 42 minutes east longitude, 1 degree 18 minutes south latitude.
(5) B/HOLE USE	:	A = Agricultural L = Livestock P = Public water supply I = Industrial/Commercial X = Exploratory B = Observation O = Other U = Unknown D = Domestic
(6) B/HOLE OWNER	:	R = Rural C = Urban water suppl B = Observation, MOWD A = Range water, MOWD L = Livestock marketing division O = Other U = Unknown
(7) ELEVATION	:	Ground surface elevation in metres
(8) TOTAL DEPTH	:	Total depth of well in metres
(9) HORIZONS NO	:	Number of producing horizons
(10) ROCK TYPE	:	1 = Volcanic 2 = Basement 3 = Sedimentary 4 = Volcanic over Basement 5 = Sedimentary over Basement 6 = Sedimentary over volcanic 7 = Volcanic over Sedimentary 8 = Others 9 = Unknown

DEPTH TO WATER LEVELS

(11) STRUCK DEPTH	:	Water struck depth in metres
(12) REST W. LEVEL	:	Rest water level depth in metres



Table 1.2 (2/3) key of headings of borehole data

---

CASING/OPENINGS

- (13) DIAMETER CASE : Diameter at bottom in cm
- (14) CASING TYPE : Type of openings. These codes are;  
H = Open hole  
P = Perfs or slots, gravelled  
R = Perfs or slots, not gravelled  
S = Screen, gravelled  
C = Screen, not gravelled  
B = Backfilled  
O = Others  
U = Unknown
- (15) BASE CASING : Base blank in metres
- (16) LENGTH OPEN : Length of openings
- (17) PUMPING TEST/NO: Pumping tests

FINAL PUMPING TEST

- (18) DISCHARGE : Discharge in litres per minute
- (19) DRAWDOWN : Drawdown during the test in metres
- (20) PUMPING HOURS : Length of pumping in hours
- (21) RECOVERY : Length of recovery in house

POTABILITY

- (22) The codes are : G = Good  
P = Saline, potable  
S = Saline, nonpotable  
U = Unknown
- (23) B/HOLE STATUS : Status of the borehole; codes are:  
C = Completed/in use  
A = Abandoned  
L = Abandoned after service  
S = Abandoned but serviceable  
U = Unknown
- (24) COMPLETE YEAR : Year completed
- (25) COMPLETE MONTH : Month completed

Table 1.2 (3/3) key to Readings of borehole data

(26) MONITORING : Monitoring frequency; the codes are:

N = Never  
Y = Yearly or less frequent  
M = More frequent than yearly  
F = Formerly but not now  
U = Unknown

(27) DISTRICT CODES are as follows:

11	Nairobi	61	Kisii
21	Kiambu	62	Kisumu
22	Kirinyaga	63	Siaya
23	Muranga	64	South Nyanza
24	Nyandarua		
25	Nyeri		
		71	Baringo
		72	Elgeyo Marakwet
31	Kilifi	73	Kajiado
32	Kwale	74	Kericho
33	Lamu	75	Laikipia
34	Mombasa	76	Nakuru
35	Taita Taveta	77	Nandi
36	Tana River	78	Narok
		79	Samburu
		81	Trans-Nzoia
41	Embu	82	Turkana
42	Isiolo	83	Uasin Gishu
43	Kitui	84	West Pokot
44	Machakos	91	Bungoma
45	Marsabit	92	Busia
46	Meru	93	Kakamega
51	Garissa		
52	Mandera		
53	Wajir		

(28) QUADRAT : Quadrat of a map

(29) MAP SHEET NO : Map reference number

(30) DRAINAGE AREA : Hydrological catchment e.g. 4ED  
refers to drainage area 4, basin E,  
subbasin D.