

REPUBLIC OF SIEERA LEONE

GUMA VALLEY WATER COMPANY

**SUBMISSION OF INVOICE NO.00100 AND
REPORT FOR**

**CONSTANT RATE DURATION TEST IN
GRAFTON**

PROCUREMENT NUMBER: SH - WKS010

PREPARED BY: EDAL DRILLING COMPANY LIMITED

WATERLOO STREET

FREETOWN

MARCH 2009



EDAL DRILLING COMPANY LTD.

THE Ag GENERAL MANAGER
GUMA VALLEY WATER COMPANY
LAMINA SANKOH STREET
FREETOWN

March 18, 2009

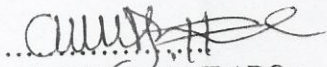
Dear Sir,

**SUBMISSION OF INVOICE NO.00100 OF DURATION TEST ON
FOUR (4) BOREHOLES PUMP TESTED FOR 24HRS IN
GRAFTON**

We submit herewith the attach Invoice No. 00100 and Report of Four (4)
Boreholes Duration Test for 24Hrs in Grafton, for necessary action.

We count on your usual co – operation.

Yours faithfully


MR. DIVINE AMLADO
(PROJECT MANAGER)

STATEMENT NO.2

STATEMENT: FOUR (4) BOREHOLES DURATION TEST FOR
24HRS PUMP TEST IN GRAFTON

WORK COVERING PERIOD: 12TH MARCH TO 19TH 2009

No.	COMMUNITIES	BOREHOLES/REF No.	AMOUT (Le)
1	GRAFTON (ISMAEL CAMP)	BH - 0009	6,000,000
2	GRAFTON (POLICE BARRACKS)	BH - 00010	6,000,000
3	GRAFTON (BAPTIST SCH)	BH - 00011	6,000,000
4	GRAFTON (GOFLAMES SCH)	BH - 00012	6,000,000
TOTAL			24,000,000

Amado Divice
(Project manager)

SAMMARY SHEET OF 24HRS DURATION TEST DATA IN GRAFTON

No.	COMMUNITIES	LOCATION CODE	BH ID	Const. DEPTH(m)	PUMP SETTING (m)	STATIC WATER LEVEL(m)	DISCHARGE (l/min)	DISCHARGE (m3/h)	DYNAMIC WATER LEVEL(m)	DRAW - DOWN(m)
1	Grafton	Ismael Camp	BH0009	69	50	10.03	100.00	6.00	44.71	34.68
2	Grafton	Police Barracks	BH0010	71	50	15.71	168	10.08	33.54	17.83
3	Grafton	Baptist School	BH0011	72	50	12.36	108	6.48	40.88	28.52
4	Grafton	Goflames School	BH0012	84	76	11.62	40	2.4	53.23	41.9

[illegible]

SIERRA LEONE GUMA VALLEY WATER COMPANY
24HRS Borehole Pump Test - Constant Discharge Period (MECHANIZED)

Community: GRAFTON

Date: 13 - 14/03/2009

Location Code: ISMAEL CAMP

Tested by: EDAL DRILLING CO LTD

Boreholes Ref No: BH0009

Ht. of datum above GL(m) 0.52m

Datum level: ☒ Top of casing
☐ Base slab
☐ Other Specify

Depth 69m

Static water level 10.03

Pump setting 50m

CONSTANT DISCHARGE					CONSTANT DISCHARGE			
Time	Time since pumping began(min)	Discharge rate (iprm)	Water level below datum (m)	Drawdown (m)	Time	Time since pumping began(min)	Water level below datum	Drawdown (m)
10:00	0	120	10.03					
	1	120	17.35	7.32	17:00	420	41.14	31.11
	2	120	19.43	9.40		480	41.81	31.78
	3	120	21.11	11.08		540	42.81	32.78
	4	120	22.44	12.41		600	43.31	33.28
	5	120	23.16	13.13		660	43.51	33.48
	6	120	23.94	13.91		720	43.61	33.58
	7	120	24.61	14.58		780	43.76	33.73
	8	120	25.14	15.11		840	44.10	34.07
	9	120	25.44	15.41	1:00	900	44.21	34.18
10:10	10	120	25.74	15.71		960	44.36	44.21
	15	120	26.70	16.67		1120	44.41	34.38
	20	120	27.30	17.27		1180	44.47	34.44
	25	120	27.11	17.08		1240	44.49	34.46
	30	120	28.90	18.87		1300	44.52	34.49
	35	120	30.60	20.57		1360	44.56	34.53
	40	120	31.54	21.51		1420	44.61	34.58
	45	120	31.91	21.88		1480	44.68	34.65
	50	120	32.44	22.41	10:00	1540	44.71	34.68
	55	120	32.62	22.59				
11:00	60	120	32.83	22.80				
	75	120	33.40	23.37				
	90	120	34.91	24.88				
	105	120	36.39	26.36				
12:00	120	120	37.46	27.43				
	135	120	37.83	27.80				
	150	120	38.01	27.98				
	165	120	38.45	28.42				
13:00	180	120	38.60	28.57				
	210	120	39.24	29.21				
14:00	240	120	40.20	30.17				
	270	120	40.35	30.32				
15:00	300	120	40.43	30.40				
	330	120	40.71	30.68				
16:00:00	360	120	40.90	30.87				

SIERRA LEONE GUMA VALLEY WATER COMPANY
24HRS Borehole Pump Test - Recovery Period (MECHANIZED)

Community: GRAFTON

Date: 14/03/2009

Location Code: ISMAEL CAMP

Tested by: EDAL DRILLING CO LTD

Boreholes Ref No: BH0009

Ht. of datum above GL(m) 0.52m

Datum level ☒ Top of casing
☐ Base slab
☐ Other Specify

Depth 69m

Static water level 10.03

Pump setting 50m

RECOVERY					RECOVERY			
Time	Time since pump Stopped(min)	Discharge rate (iprm)	Water level below datum (m)	Drawdown (m)	Time	Time since pump stopped(min)	Water level below datum	Drawdown (m)
10:00	0	120	44.71					
	1	120	41.52	31.49	17:00	420	18.8	8.77
	2	120	41.37	31.34		480	18.54	8.51
	3	120	41.45	31.42		540	18.26	8.23
	4	120	41.21	31.18		600	18.01	7.98
	5	120	41.02	30.99		660	17.92	7.89
	6	120	40.94	30.91		720	17.64	7.61
	7	120	40.91	30.88				
	8	120	40.81	30.78				
	9	120	40.46	30.43				
10:10	10	120	38.88	28.85				
	15	120	36.97	26.94				
	20	120	34.51	24.48				
	25	120	32.57	22.54				
	30	120	31.80	21.77				
	35	120	30.76	20.73				
	40	120	29.82	19.79				
	45	120	29.25	19.22				
	50	120	28.85	18.82				
	55	120	28.51	18.48				
11:00	60	120	27.62	17.59				
	75	120	26.84	16.81				
	90	120	25.53	15.50				
	105	120	24.61	14.58				
12:00	120	120	23.84	13.81				
	135	120	232.24	222.21				
	150	120	22.76	12.73				
	165	120	22.34	12.31				
13:00	180	120	21.56	11.53				
	210	120	21.14	11.11				
14:00	240	120	20.97	10.94				
	270	120	20.51	10.48				
15:00	300	120	20.09	10.06				
	330	120	19.87	9.84				
16:00:00	360	120	19.04	9.01				

[illegible]

SIERRA LEONE GUMA VALLEY WATER COMPANY
24HRS Borehole Pump Test - Constant Discharge Period (MECHANIZED)

Community: GRAFTON

Date: 14 - 15/03/2009

Location Code: POLICE BARRACKS

Tested by: EDAL DRILLING CO LTD

Boreholes Ref No: BH00010

Ht. of datum above GL(m) 0.53m

Datum level: ☒ Top of casing
☐ Base slab
☐ Other Specify

Depth 73m

Static water level 15.71

Pump setting 50m

CONSTANT DISCHARGE					CONSTANT DISCHARGE			
Time	Time since pumping began(min)	Discharge rate (iprm)	Water level below datum (m)	Drawdown (m)	Time	Time since pumping began(min)	Water level below datum	Drawdown (m)
13:15	0	168	15.71		15:00			
	1	168	18.12	2.41		420	33.33	17.62
	2	168	19.30	3.59		480	33.40	17.69
	3	168	20.01	4.30		540	33.42	17.71
	4	168	21.61	5.90		600	33.46	17.75
	5	168	22.11	6.40		660	33.48	17.77
	6	168	22.81	7.10		720	33.49	17.78
	7	168	23.15	7.44		780	33.50	17.79
	8	168	23.49	7.78		840	33.51	17.80
	9	168	23.84	8.13	4:15	900	33.52	17.81
13:25	10	168	24.10	8.39		960	33.53	17.81
	15	168	24.92	9.21		1120	33.53	17.82
	20	168	25.34	9.63		1180	33.53	17.82
	25	168	25.61	9.90		1240	33.53	17.82
	30	168	25.94	10.23		1300	33.54	17.83
	35	168	26.11	10.40		1360	33.54	17.83
	40	168	26.40	10.69		1420	33.54	17.83
	45	168	26.73	11.02		1480	33.54	17.83
	50	168	27.40	11.69	13:15	1540	33.54	17.83
	55	168	27.81	12.10				
14:15	60	168	28.09	12.38				
	75	168	29.34	13.63				
	90	168	29.59	13.88				
	105	168	29.95	14.24				
15:15	120	168	30.13	14.42				
	135	168	30.28	14.57				
	150	168	30.54	14.83				
	165	168	30.73	15.02				
16:15	180	168	30.91	15.20				
	210	168	32.48	16.77				
17:15	240	168	32.52	16.81				
	270	168	32.81	17.10				
18:15	300	168	32.90	17.19				
	330	168	32.96	17.25				
15:00	360	168	33.07	17.36				

SIERRA LEONE GUMA VALLEY WATER COMPANY
24HRS Borehole Pump Test - Recovery Period (MECHANIZED)

Community: GRAFTON

Date: 15/03/2009

Location Code: POLICE BARRAKS

Tested by: EDAL DRILLING CO LTD

Boreholes Ref No: BH00010

Ht. of datum above GL(m) 0.53m

Datum level ☒ Top of casing
☐ Base slab
☐ Other Specify

Depth 73m

Static water level 15.71

Pump setting 50m

RECOVERY					RECOVERY			
Time	Time since pump Stopped(min)	Discharge rate (iprm)	Water level below datum (m)	Drawdown (m)	Time	Time since pump stopped(min)	Water level below datum	Drawdown (m)
3:36	0	168	33.54					
	1	168	29.75	14.04		420		
	2	168	28.72	13.01		480		
	3	168	27.53	11.82		540		
	4	168	26.24	10.53		600		
	5	168	25.41	9.70		660		
	6	168	24.92	9.21		720		
	7	168	23.66	7.95				
	8	168	22.42	6.71				
	9	168	21.30	5.59				
13:25	10	168	20.04	4.33				
	15	168	18.30	2.59				
	20	168	17.96	2.25				
	25	168	17.34	1.63				
	30	168	16.90	1.19				
	35	168	16.60	0.89				
	40	168	16.40	0.69				
	45	168	16.30	0.59				
	50	168	16.28	0.57				
	55	168	16.25	0.54				
14:00	60	168	16.20	0.49				
	75	168	16.09	0.38				
	90	168	16.05	0.34				
	105	168	16.00	0.29				
15:00	120	168	15.89	0.18				
	135	168	15.85	0.14				
	150	168	15.82	0.11				
	165	168	15.81	0.10				
16:00	180	168	15.80	0.09				
	210	168	15.79	0.08				
17:00	240	168	15.79	0.08				

SIERRA LEONE GUMA VALLEY WATER COMPANY
Borehole Step Test - Discharge Period (MECHANIZED)

Date: 16/12/2009

Tested by: EDAL DRILLING CO LTD

Ht. of datum 0.53m
above GL(m)

Depth 72m

Pump setting 50m

[illegible]

SIERRA LEONE GUMA VALLEY WATER COMPANY
24HRS Borehole Pump Test - Constant Discharge Period (MECHANIZED)

Community: GRAFTON

Date: 15- 16/03/2009

Location Code: BAPTIST SCHOOL

Tested by: EDAL DRILLING CO LTD

Boreholes Ref No: BH00011

Ht of datum above GL(m) 0.53m

Datum level: ☒ Top of casing
☐ Base slab
☐ Other Specify

Depth 72m

Static water level 12.36

Pump setting 50m

CONSTANT DISCHARGE					CONSTANT DISCHARGE			
Time	Time since pumping began(min)	Discharge rate (iprm)	Water level below datum (m)	Drawdown (m)	Time	Time since pumping began(min)	Water level below datum	Drawdown (m)
11:00	0	108	12.36		00:00			
	1	108	13.81	1.45		420	38.59	26.23
	2	108	14.38	2.02		480	38.74	26.38
	3	108	14.84	2.48		540	38.96	26.60
	4	108	15.22	2.86		600	39.30	26.94
	5	108	15.67	3.31		660	39.63	27.27
	6	108	15.40	3.04		720	39.82	27.46
	7	108	16.22	3.86		780	39.98	27.62
	8	108	16.47	4.11		840	40.17	27.81
	9	108	16.83	4.47	19:00	900	40.23	27.87
11:00	10	108	16.94	4.58		960	40.37	27.87
	15	108	17.94	5.58		1120	40.45	28.09
	20	108	18.72	6.36		1180	40.53	28.17
	25	108	19.15	6.79		1240	40.67	28.31
	30	108	19.65	7.29		1300	40.71	28.35
	35	108	19.72	7.36		1360	40.78	28.42
	40	108	19.77	7.41		1420	40.82	28.46
	45	108	19.98	7.62		1480	40.85	28.49
	50	108	20.23	7.87	20:00	1540	40.88	28.52
	55	108	20.36	8.00				
12:00	60	108	20.43	8.07				
	75	108	22.95	10.59				
	90	108	29.63	17.27				
	105	108	31.48	19.12				
13:00	120	108	32.17	19.81				
	135	108	33.47	21.11				
	150	108	34.24	21.88				
	165	108	34.82	22.46				
14:00	180	108	35.32	22.96				
	210	108	35.94	23.58				
15:00	240	108	36.63	24.27				
	270	108	36.93	24.57				
16:00	300	108	37.38	25.02				
	330	108	38.02	25.66				
00:00	360	108	38.25	25.89				

SIERRA LEONE GUMA VALLEY WATER COMPANY
24HRS Borehole Pump Test - Recovery Period (MECHANIZED)

Community: GRAFTON

Date: 16/03/2009

Location Code: BAPTIST SCHOOL

Tested by: EDAL DRILLING CO LTD

Boreholes Ref No: BH00011

Ht. of datum above GL(m) 0.53m

Datum level ☒ Top of casing
☐ Base slab
☐ Other Specify

Depth 72m

Static water level 12.36

Pump setting 50m

RECOVERY					RECOVERY			
Time	Time since pump Stopped(min)	Discharge rate (iprm)	Water level below datum (m)	Drawdown (m)	Time	Time since pump stopped(min)	Water level below datum	Drawdown (m)
3:36	0	108	40.88					
	1	108	36.17	23.81		420	13.28	0.92
	2	108	34.80	22.44		480	13.24	0.88
	3	108	32.10	19.74		540	13.22	0.86
	4	108	30.46	18.10		600		
	5	108	28.10	15.74		660		
	6	108	27.76	15.40		720		
	7	108	26.54	14.18				
	8	108	25.36	13.00				
	9	108	24.40	12.04				
13:25	10	108	23.16	10.80				
	15	108	19.79	7.43				
	20	108	18.30	5.94				
	25	108	17.92	5.56				
	30	108	17.15	4.79				
	35	108	16.89	4.53				
	40	108	16.54	4.18				
	45	108	16.31	3.95				
	50	108	16.04	3.68				
	55	108	15.90	3.54				
14:00	60	108	15.63	3.27				
	75	108	15.00	2.64				
	90	108	14.89	2.53				
	105	108	14.46	2.10				
15:00	120	108	14.24	1.88				
	135	108	14.16	1.80				
	150	108	14.07	1.71				
	165	108	13.93	1.57				
16:00	180	108	13.78	1.42				
	210	108	13.62	1.26				
17:00	240	108	13.54	1.18				
	270	108	13.48	1.12				
	300	108	13.4	1.04				
	330	108	13.34	0.98				
	360	108	13.3	0.94				

SIERRA LEONE GUMA VALLEY WATER COMPANY
Borehole Step Test - Discharge Period (MECHANIZED)

Date: 17/12/2009

Tested by: EDAL DRILLING CO LTD

Ht. of datum 0.50m

Depth 84m

Static water level 10.89

Pump setting 60m

[illegible]

SIERRA LEONE GUMA VALLEY WATER COMPANY
24HRS Borehole Pump Test - Constant Discharge Period (MECHANIZED)

Community: GRAFTON

Date: 17- 18/03/2009

Location Code: GOFLAMES SCHOOL

Tested by: EDAL DRILLING CO LTD

Boreholes Ref No: BH00012

Ht. of datum above GL(m) 0.50m

Datum level: ☒ Top of casing
☐ Base slab
☐ Other Specity

Depth 84mm

Static water level 11.62

Pump setting 76m

CONSTANT DISCHARGE					CONSTANT DISCHARGE			
Time	Time since pumping began(min)	Discharge rate (iprm)	Water level below datum (m)	Drawdown (m)	Time	Time since pumping began(min)	Water level below datum	Drawdown (m)
11:00	0	40	11.62		17:00			
	1	40	13.02	1.40		420	49.82	38.20
	2	40	15.06	3.44		480	50.11	38.49
	3	40	18.96	7.34		540	50.45	38.83
	4	40	20.72	9.10		600	50.17	38.55
	5	40	21.05	9.43		660	51.25	39.63
	6	40	22.83	11.21		720	51.56	39.94
	7	40	23.02	11.40		780	51.75	40.13
	8	40	24.03	12.41		840	51.95	40.33
	9	40	25.66	14.04	19:00	900	52.12	40.50
11:00	10	40	26.12	14.50		960	52.34	40.50
	15	40	28.40	16.78		1120	52.53	40.91
	20	40	30.16	18.54		1180	52.67	41.05
	25	40	33.56	21.94		1240	52.76	41.14
	30	40	35.10	23.48		1300	52.85	41.23
	35	40	37.52	25.90		1360	52.96	41.34
	40	40	38.12	26.50		1420	53.17	41.55
	45	40	38.92	27.30		1480	53.34	41.72
	50	40	39.76	28.14	20:00	1540	53.52	41.90
	55	40	40.23	28.61				
12:00	60	40	40.88	29.26				
	75	40	42.11	30.49				
	90	40	42.56	30.94				
	105	40	42.96	31.34				
13:00	120	40	43.58	31.96				
	135	40	43.93	32.31				
	150	40	45.13	33.51				
	165	40	45.92	34.30				
14:00	180	40	45.92	34.30				
	210	40	46.47	34.85				
15:00	240	40	47.33	35.71				
	270	40	47.67	36.05				
16:00	300	40	48.18	36.56				
	330	40	48.84	37.22				
17:00	360	40	49.42	37.80				

SIERRA LEONE GUMA VALLEY WATER COMPANY
24HRS Borehole Pump Test - Recovery Period (MECHANIZED)

Community: **GRAFTON**

Date: **18/03/2009**

Location Code: **GOFLAMES SCHOOL**

Tested by: **EDAL DRILLING CO LTD**

Boreholes Ref No: **BH00012**

Ht. of datum above GL(m) **0.50m**

Datum level: ☒ Top of casing
☐ Base slab
☐ Other Specify

Depth **84m**

Static water level **11.62**

Pump setting **76m**

RECOVERY					RECOVERY			
Time	Time since pump Stopped(min)	Discharge rate (iprm)	Water level below datum (m)	Drawdown (m)	Time	Time since pump stopped(min)	Water level below datum	Drawdown (m)
3:36	0	40	53.52					
	1	40	49.42	37.80		420	16.00	4.38
	2	40	47.72	36.10		480	15.74	4.12
	3	40	46.22	34.60		540	15.23	3.61
	4	40	44.95	33.33		600	14.91	3.29
	5	40	43.72	32.10		660	14.51	2.89
	6	40	42.55	30.93		720	14.29	2.67
	7	40	41.52	29.90				
	8	40	40.61	28.99				
	9	40	39.75	28.13				
13:25	10	40	39.02	27.40				
	15	40	35.95	24.33				
	20	40	33.82	22.20				
	25	40	32.04	20.42				
	30	40	30.37	18.75				
	35	40	29.13	17.51				
	40	40	28.04	16.42				
	45	40	27.06	15.44				
	50	40	26.22	14.60				
	55	40	25.44	13.82				
14:00	60	40	24.73	13.11				
	75	40	23.02	11.40				
	90	40	21.54	9.92				
	105	40	20.64	9.02				
15:00	120	40	20.54	8.92				
	135	40	19.04	7.42				
	150	40	19.18	7.56				
	165	40	18.84	7.22				
16:00	180	40	18.56	6.94				
	210	40	17.90	6.28				
17:00	240	40	17.64	6.02				
	270	40	17.36	5.74				
	300	40	17.10	5.48				
	330	40	16.83	5.21				
	360	40	16.59	4.97				