

EDAL DRILLING COMPANY LIMITED

BOREHOLE DRILLING REPORTS FOR



GUMA VALLEY WATER COMPANY

PREPARED BY:

EDAL DRILLING COMPANY
49 WATERLOO STREET
SIERRA LEONE
FREETOWN

FOR:

GUMA VALLEY WATER COMPANY
SIERRA LEONE
FREETOWN

SUMMARY

No.	COMMUNITIES	DEPTH(M)	STATUS	AMOUNT(US\$)
1	GRAFTON (MONGEGBA)	70	Marginal	11,875
2	GRAFTON (ORUGU BRIDGE)	67	Successful	12,598
3	GRAFTON (CRS COMPOUND)	60	Dry	7,990
4	REGENT	70	Successful	14,362
	TOTAL	267		46,825

GRAFTON MONGEGBA

Item	Requirement	Unit	Quantity	Rate(US\$)	Amount(US\$)
1					
1.1	Insurance of works	Sum	Lump		
1.2	Insurance of Construction Plant	Sum	Lump		
1.3	Insurance against damage to person and property	Sum	Lump		
1.4	Insurance of the personal effects of the Project Manager to a value of US\$1000	Sum	Lump		
1.5	Insurance to damage to all property of the employer including consequential replacement of books, measurement and records to a value of US\$1,000	Sum	Lump		
1.6	Provisionn of performance bond	Sum	Lump		
2	Mobilization and demobilization of all necessary plant, office and storage accommodation, ancillary works and services for the drilling, construction, development, pump testing and completion of boreholes; include for clearance of site on completion.	Lump	1	2500	2,500
3	Preparation of borehole sites and reinstatement of borehole sites	No.	1	150	150
4	Provision and erection of temporay fencing to access roads storage and work areas	M	100	0.5	50.0
5	Removal of fencing on completion	Sum	Lump		100
6	Transport rig, plant, materials, equipment etc. between sites set up and dismantle rig, plant, equipment etc. at each borehole (per borehole)	No.	1	525	525
7	Drill 203mm minimum diameter hole from ground level to a maximum of 70m include for geological sampling, penetration rate and sampling	M	70	120	8,400
8	Supply and Install 125mm diameter PVC Casing	M	0	32	0
9	Supply and Install 125mm diameter PVC screen	No.	0	36	0
10	Supply and install gravel Pack	No.	0	450	0
11	Supply grout and place as sanitary seal above gravel (Cement for Backfilling Dry borehole)	No.	2	15	30
12	Cleaning, Development of borehole by airlifting	Hr	1	70	70
13	Transport plant for pump testing between sites, set up and dismantle at each sites	No.	0	250	0
14	Carry out step testpump testing with pump specified, incude for disposal of discharged water (per Hour of pumping)	Hr	0	100	0

Item	Requirement	Unit	Quantity	Rate(US\$)	Amount(US\$)
15	Carry out recovery tests as specified (per Hour)	Hr	0	50	0
16	Carry out pump testing with pump as specified, include for disposal of discharged water (per Hour of pumping)	Hr	0	80	0
17	Supply and Install well head as specified. Seal annular space between casing and conductor pipe, include for cement to set	No	0	200	0
18	Provide containers, labelled, water samples	No	0	1	0
19	Measure and record EC, pH and pH during pump testing and development.	Lump	Sum		
20	Prepare and deliver to the Project Manager, borehole reports as 2 copies as specified in the manner specified.	No	1	50	50
21	Standing time (per hour) Rate only				
	TOTAL				11,875

P1	Supply and install minimum diameter 200mm inside diameter galvanneal steel conductor casing as specified, include centralisers and all other fittings as specified	No rate only	40		Not required
P2	Cement annular space between conductor casing and pipe, include for waiting time for cement to set (per borehole)	No rate only	4		Not required
P3	Carry out geophysical logging as specified	No rate only	4		Not required

Geophysics ref.No.		Edal Drilling Company Limited 49 Waterloo Street Sierra Leone, Freetown				BH status: Successful	
BH-01		BOREHOLE RECORD					
Community		Mongegba Grafton		BH ref. No.		BH-01	
Drilling contractor		Edal Drilling Company		Drill rig		Super DTH	
Drilling start date		18th Nov 2009		Compl. date		23rd Nov 2009	
Drilling start date		18th Nov 2009		Compl. date		23rd Nov 2009	
Operator		Raju Govindaraju					
TEST PUMPING				Date:		Top of screen *	
Dynamic WL *		m		Pump type		Static WL *	
Static WL *		m		Pumping rate (Q)		m³/h	
Drawdown (s)		m		Duration		h	
* Levels to ground level datum				Specific capacity (Q/s)		m³/h/m	
						Depth of borehole *	
						70 m	
BIT SIZE & TYPE		TEMPERATURE °C		SCALE		PROFILE	
						TIME/DEPTH M/MIN	
						WATER ZONES CUMULATIVE Q (l/min)	
						WELL DIAGRAM with STATIC AND DYNAMIC WATER LEVELS	
						SCALE	
12" Drag Bit (304mm) (mud drilling)		10		Silty Clay		Cement Seal	
		20					
		30		Very weathered lateritic clay mixed with pebbles			
		40				Muddy	
		50		Weathered Gabbro			
8.5" DTH (203MM)		60		Slightly hard gabbro with quartz vein		Back fill with Dry cutting	
		70				0.04	
		80					
		90					
		100					
		110					
		120					
		130					
		140					
Gravel for gravel pack		M³		Remarks: Marginal well			
Cement for grouting		KG					
Bentonite for grouting		KG					
Installation of grout seal		M					
Cleaning & development		HRS		Prepared by: Edal Drilling Company		(Contractor)	
Centralisers fitted		Yes		Certified:		(Consultant)	
Safety cap fitted		Yes		Approved:			
Backfill aband. BH		Yes		Approved:			
Disinfection date				Approved:			
Platform construct. date				Approved:			
Platform transport adjust.				Approved:			
Cut access to site				Approved:			

DAILY LOG FOR DRILLING SUPERVISION

CONTRACT		MONGEGBA		WELL BH - 01		DATE		18 - 23/11/09	
LOCATION CODE:				CONTRACTOR				Edal Drilling bCompany Limited	
TIME: 8:15am		START OF WORKING HR		END OF WORKING HR: 4:16pm				WEATHER	
DATE: 26/11/09								DURATION OF RAINFALL	
DEPTH OF HOLE (M)		70M				GEOPHYSICS		MONG/BH - 01	
DEPTH CASED(M)						REF. POINT			
LITHOLOGICAL BOUNDARIES AND SAMPLES OF FORMATION									
DEPTH OF CONTACT ZONE		DRILLING PROCESS			DESCRIPTION OF FORMATION			YIELD	REMARKS(Drilling Method including change of Bit)
DEPTH	SAMPLE	FROM	TO	SPEED					
0 - 5	5	11:09	11:19	2	Silty Clay				Started with 10"
					"				DTH to 45m by
					"				air drilling and
5 10	10	11:28	11:37	3.4	"				later rim with 12"
					"				Drag bit by mud
					"				drilling to the
10 15	15	12:15	12:21	1.4	"				basement.
					"				
					"				
15 20	20	12:31	12:34	0.6	"				
					"				
					Very Weathered gabbro mixed with				
20 25	25	11:34	11:39	1	Pebbles				
					"				
					"				
25 30	30	11:43	11:57	2.8	"				
					"				
					"				
30 35	35	12:00	12:09	1.8	"				We now cont.
					"				from 45m with 8"
					"				DTH to 70m by
35 40	40	12:12	12:17	1.0	"				Air drilling.
					"				
					"				
40 45	45	12:19	12:24	1.0	"				
					"			Muddy	
					Weatherd from 44m to 58m				
45 50	50	4:37	4:57	4.0	"				
					"				
					"				
50 55	55	5:05	5:47	8.4	"				
					Slightly Hard Gabbro from 58m to 70m				
					"				
55 60	60	8:58	9:30	6.4	"				
					"				
					"				
60 65	65	9:35	10:06	6.2	"			0.04	
65 70	70	10:11	10:45	5	"				

GRAFTON (ORUGU BRIDGE)

Item	Requirement	Unit	Quantity	Rate(US\$)	Amount(US\$)
1					
1.1	Insurance of works	Sum	Lump		
1.2	Insurance of Construction Plant	Sum	Lump		
1.3	Insurance against damage to person and property	Sum	Lump		
1.4	Insurance of the personal effects of the Project Manager to a value of US\$1000	Sum	Lump		
1.5	Insurance to damage to all property of the employer including consequential replacement of books, measurement and records to a value of US\$1,000	Sum	Lump		
1.6	Provisionn of performance bond	Sum	Lump		
2	Mobilization and demobilization of all necessary plant, office and storage accommodation, ancillary works and services for the drilling, construction, development, pump testing and completion of boreholes; include for clearance of site on completion.	Lump	0	2500	0
3	Preparation of borehole sites and reinstatement of borehole sites	No.	1	150	150
4	Provision and erection of temporay fencing to access roads storage and work areas	M	100	0.5	50.0
5	Removal of fencing on completion	Sum	Lump		
6	Transport rig, plant, materials, equipment etc. between sites set up and dismantle rig, plant, equipment etc. at each borehole (per borehole)	No.	1	525	525
7	Drill 203mm minimum diameter hole from ground level to a maximum of 70m include for geological sampling, penetration rate and sampling	M	67	120	8,040
8	Supply and Install 125mm diameter PVC Casing	M	55	32	1,760
9	Supply and Install 125mm diameter PVC screen	No.	12	36	432
10	Supply and install gravel Pack	No.	1	450	450
11	Supply grout and place as sanitary seal above gravel (Cement for Backfilling Dry borehole)	No.	8	15	120
12	Cleaning, Development of borehole by airlifting	Hr	6	70	420
13	Transport plant for pump testing between sites, set up and dismantle at each sites	No.	1	250	250
14	Carry out step testpump testing with pump specified, incude for disposal of discharged water (per Hour of pumping)	Hr	1	100	100

Item	Requirement	Unit	Quantity	Rate(US\$)	Amount(US\$)
15	Carry out recovery tests as specified. (per Hour)	Hr	0	50	0
16	Carry out pump testing with pump as specified, include for disposal of discharged water (per Hour of pumping)	Hr	0	80	0
17	Supply and install well head as specified, Seal annular space between casing and conductor pipe, include for cement to set	No	1	200	200
18	Provide containers and collect water samples	No	1	1	1
19	Measure and record EC, Eh and pH during pump testing and development.	Lump	Sum		50
20	Prepare and deliver to the Project Manager, borehole reports as 2 copies per report in the manner specified.	No	1	50	50
21	Standing time (per rig hour) Rate only				
	TOTAL				12,598

P1	Supply and install minimum diameter 200mm inside diameter galvanised steel conductor casing as specified, include for centralisers and all other fittings as specified	No rate only	40		Not required
P2	Cement annular space between conductor casing and hole. Include for waiting time for cement to set (per borehole)	No rate only	4		Not required
P4	Carry out geophysical logging as specified	No rate only	4		Not required

Geophysics ref. No.		Edal Drilling Company Limited 49 Waterloo Street Sierra Leone, Freetown		BH status: Successful	
BH-02		BOREHOLE RECORD			
Community	Grafton (Orugu Bridge)	BH ref. No.	BH-02	Nat. grid ref.	
Drilling contractor	Edal Drilling Company	Drill rig	Super DTH	Method	Mud Drilling
Drilling start date	24th Nov 2009	Compl. date	24rd Nov 2009	Operator	Raju Govindaraju
TEST PUMPING		Date:	8th Dec 2009	Top of screen *	29 m
Dynamic WL *	56.31m	Pump type	Pedrollo	Static WL *	m
Static WL *	0.63m	Pumping rate (Q)	54 m ³ /h	Potential drawdown	m
Drawdown (s)	55.68m	Duration	35 min	Potential yield	m ³ /h
* Levels to ground level datum		Specific capacity (Q/s)	0.97 m ³ /h/m	Depth of borehole *	67 m

BIT SIZE & TYPE	TAPERED SCALE	PROFILE	TIME/DEPTH M/MIN	WATER ZONES CUMULATIVE Q (l/min)	WELL DIAGRAM with STATIC AND DYNAMIC WATER LEVELS	SCALE
12" Step Bit (304mm) Mud drilling	5	Sandy Clay			Upper grout Seal	5
	10					10
	15				Backfill with drilled cuttings	15
	20	Coarse				20
	25				Lower grout Seal	25
	30				Fine sand	30
	35	Weathered gabbro with pebbles			38m Plain PVC	35
	40				Gravel Packing	40
	45				3m Screen PVC	45
	50	Fine sand with coarse			3m plain PVC	50
	55				6m Screen PVC	55
	60				12m Plain PVC	60
	65	Weathered gabbro gravel with elastic clay			3m Screen PVC	65
					2m Bail Plug	
	Gabbro at the depth of 67					
	70					70
	75					75

Gravel for gravel pack Cement for grouting Bentonite for grouting Installation of grout seal Cleaning & development Centralisers fitted Safety cap fitted Backfill aband. BH Disinfection date Platform construct. date Platform transport adjust. Cut access to site	38	M	Remarks: Successful Borehole with low yield and pumping rate sustain for only 35min with a 15l/m Prepared by: Edal Drilling Company Certified: _____ (Contractor) Approved: _____ (Consultant) Approved: _____
	400	KG	
	15	M	
	4	HRS	
Yes	No		
Yes	No		
Yes	No		

App 9-2.1

DAILY LOG FOR DRILLING SUPERVISION

CONTRACT		GRAFTON(ORUGU BRIDGE)		WELL BH - 02		DATE	24 - 25/11/2009
LOCATION CODE:						CONTRACTOR	Edal Drilling bCompany Limited
START OF WORKING HR		END OF WORKING HR: 5:18Pm				WEATHER	Shinning
TIME: 9:10:15am						DURATION OF RAINFALL	
DATE: 24/11/09						GEOPHYSICS	GF/OB/BH - 02
DEPTH OF HOLE (M)		67M				REF. POINT	
DEPTH CASED(M)							
LITHOLOGICAL BOUNDARIES AND SAMPLES OF FORMATION							
DEPTH OF CONTACT ZONE		DRILLING PROCESS			DESCRIPTION OF FORMATION	YIELD	REMARKS(Drilling Method including change of Bit)
DEPTH	SAMPLE	FROM	TO	SPEED			
0 - 5	5	1:12	1:17	1	Silty Clay		Started with 12" drag bit by
					"		doing mud drilling
5 10	10	1:19	1:24	1	"		up to 67m
					"		before we
10 15	15	1:27	1:30	0.6	"		encounter the
					"		basement at 67m
					"		
15 20	20	1:33	1:37	0.8	Darkish Coarse		
					"		
					"		
20 25	25	1:40	1:43	0.6	"		
					"		
25 30	30	1:49	1:56	1.4	"		
					"		
					"		
30 35	35	2:05	2:09	0.8	Weathered Gabbro		
					"		
					"		
35 40	40	2:26	2:30	0.8	"		
					"		
					"		
40 45	45	2:36	2:42	1.0	Fine sand with coarse		
					"	Muddy	
					"		
45 50	50	3:01	3:08	1.4	"		
					weathered Gabbro gravel		
					withy clay		
50 55	55	3:12	3:25	2.6	"		
					"		
					"		
55 60	60	3:29	3:34	1.0	"		
					"		
					"		
60 65	65	3:36	3:47	2.2	"	0.04	

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

Date: 08th Dec 2009

Tested by: EDAL DRILLING CO LTD

Ht. of datum	0.17
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Depth 67m

Pump setting 60m

Pump setting 60m

[illegible]

GRAFTON (CRS COMPOUND)

Item	Requirement	Unit	Quantity	Rate(US\$)	Amount(US\$)
1					
1.1	Insurance of works	Sum	Lump		
1.2	Insurance of Construction Plant	Sum	Lump		
1.3	Insurance against damage to person and property	Sum	Lump		
1.4	Insurance of the personal effects of the Project Manager to a value of US\$1000	Sum	Lump		
1.5	Insurance to damage to all property of the employer including consequential replacement of books, measurement and records to a value of US\$1,000	Sum	Lump		
1.6	Provisionn of performance bond	Sum	Lump		
2	Mobilization and demobilization of all necessary plant, office and storage accommodation, ancillary works and services for the drilling, construction, development, pump testing and completion of boreholes; include for clearance of site on completion.	Lump	0	2500	0
3	Preparation of borehole sites and reinstatement of borehole sites	No.	1	150	150
4	Provision and erection of temporay fencing to access roads storage and work areas	M	100	0.5	50.0
5	Removal of fencing on completion	Sum	Lump		
6	Transport rig, plant, materials, equipment etc. between sites set up and dismantle rig, plant, equipment etc. at each borehole (per borehole)	No.	1	525	525
7	Drill 203mm minimum diameter hole from ground level to a maximum of 70m include for geological sampling, penetration rate and sampling	M	60	120	7,200
8	Supply and Install 125mm diameter PVC Casing	M	0	32	0
9	Supply and Install 125mm diameter PVC screen	No.	0	36	0
10	Supply and install gravel Pack	No.	0	450	0
11	Supply grout and place as sanitary seal above gravel (Cement for Backfilling Dry borehole)	No.	1	15	15
12	Cleaning, Development of borehole by airlifting	Hr	0	70	0
13	Transport plant for pump testing between sites, set up and dismantle at each sites	No.	0	250	0
14	Carry out step testpump testing with pump specified, incude for disposal of discharged water (per Hour of pumping)	Hr	0	100	0

Item	Requirement	Unit	Quantity	Rate(US\$)	Amount(US\$)
15	Carry out recovery tests as specified. (per Hour)	Hr	0	50	0
16	Carry out pump testing with pump as specified, include for disposal of discharged water (per Hour of pumping)	Hr	0	80	0
17	Supply and Install well head as specified, Seal annular space between casing and conductor pipe, include for cement to set	No	0	200	0
18	Provide containers and collect water samples	No	0	1	0
19	Measure and record EC, Eh and pH during pump testing and development.	Lump	Sum		
20	Prepare and deliver to the Project Manager, borehole reports as 2 copies per report in the manner specified.	No	1	50	50
21	Standing time (per rig hour) Rate only				7,990
TOTAL					

P1	Supply and install minimum diameter 200mm inside diameter galvanised steel conductor casing as specified, include for centralisers and all other fittings as specified	No rate only	40		Not required
P2	Cement annular space between conductor casing and hole. Include for waiting time for cement to set (per borehole)	No rate only	4		Not required
P4	Carry out geophysical logging as specified	No rate only	4		Not required

Geophysics ref.No.		Edal Drilling Company Limited 49 waterloo Street Sierra Leone, Freetown						BH status:		Successful Dry	
BH-03		BOREHOLE RECORD									
Community		Grafton (CRS Compound)		BH ref. No.		BH-03		Nat. grid ref.			
Drilling contractor		Edal Drilling Company		Drill rig		Super DTH		Method		Air Drilling	
Drilling start date		26th Nov 2009		Compl. date		27th Nov 2009		Operator		Raju Govindaraju	
TEST PUMPING				Date:				Top of screen *		m	
Dynamic WL *		m		Pump type				Static WL *		m	
Static WL *		m		Pumping rate (Q)		m ³ /h		Potential drawdown		m	
Drawdown (s)		m		Duration		h		Potential yield		m ³ /h	
* Levels to ground level datum				Specific capacity (Q/s)		m ³ /h/m		Depth of borehole *		60 m	
BIT SIZE & TYPE		TEMPORARY SCALE		PROFILE		TIME/DEPTH M/MIN		WATER ZONES CUMULATIVE Q (l/min)		WELL DIAGRAM with STATIC AND DYNAMIC WATER LEVELS	
12" Step Bit (304mm)		SCALE		Literitic Clay						Cement Seal	
				Very weathered literatic clay mixed with pebbles						Back fill with Dry cutting	
(203MM)		60		Slightly Hard Gabbro						60	
		70								70	
		80								80	
		90								90	
		100								100	
		110								110	
		120								120	
		130								130	
		140								140	
Gravel for gravel pack				M ³		Remarks: Dry					
Cement for grouting				KG							
Bentonite for grouting				KG							
Installation of grout seal				M							
Cleaning & development				HRS							
Centralisers fitted		Yes		No		Prepared by: Edal Drilling Company (Contractor)					
Safety cap fitted		Yes		No		Certified: (Consultant)					
Backfill aband. BH		Yes		No		Approved:					
Disinfection date						Approved:					
Platform construct. date											
Platform transport adjust.											
Cut access to site											

DAILY LOG FOR DRILLING SUPERVISION

CONTRACT		CRS COMPOUND		WELL BH - 03		DATE	26 - 27/11/09	
LOCATION CODE:						CONTRACTOR	Edal Drilling bCompany Limited	
TIME: 8:15am	START OF WORKING HR	END OF WORKING HR: 4:16pm				WEATHER	Shinning	
DATE: 26/11/09						DURATION OF RAINFALL		
DEPTH OF HOLE (M)		60M				GEOPHYSICS	CRS/BH - 03	
DEPTH CASED(M)						REF. POINT		
LITHOLOGICAL BOUNDARIES AND SAMPLES OF FORMATION								
DEPTH OF CONTACT ZONE		DRILLING PROCESS			DESCRIPTION OF FORMATION		YIELD	REMARKS(Drilling Method including change of Bit
DEPTH	SAMPLE	FROM	TO	SPEED				
0 - 5	5	9:08	9:13	1	Literitic Clay			Started with 10"
					"			DTH to 57m
					"			and Cont. with 8"
5 10	10	9:15	9:22	1.4	"			DTH to 60m
					"			
					"			
10 15	15	9:25	9:33	1.6	"			
					"			
					"			
15 20	20	9:35	9:44	1.8	"			
					"			
					Very Weathered gabbro mixed with			
20 25	25	9:48	9:53	1	Pebbles			
					"			
					"			
25 30	30	9:55	10:05	2	"			
					"			
					"			
30 35	35	10:10	10:18	1.6	"			
					"			
					"			muddy
35 40	40	10:24	10:31	1.4	"			
					"			
					"			
40 45	45	11:16	11:30	2.8	"			
					"			
					"			
45 50	50	11:34	11:43	1.8	"			
					"			
					"			
50 55	55	11:47	11:54	1.4	"			
					From 57m to 60 m Slightly Hard gabbro			
					"			
55 60	60	12:01	12:11	2.0				
60 65	65							

RECENT

Item	Requirement	Unit	Quantity	Rate(US\$)	Amount(US\$)
1					
1.1	Insurance of works	Sum	Lump		
1.2	Insurance of Construction Plant	Sum	Lump		
1.3	Insurance against damage to person and property	Sum	Lump		
1.4	Insurance of the personal effects of the Project Manager to a value of US\$1000	Sum	Lump		
1.5	Insurance to damage to all property of the employer including consequential replacement of books, measurement and records to a value of US\$1,000	Sum	Lump		
1.6	Provisionn of performance bond	Sum	Lump		
2	Mobilization and demobilization of all necessary plant, office and storage accommodation, ancillary works and services for the drilling, construction, development, pump testing and completion of boreholes; include for clearance of site on completion.	Lump	0	2500	0
3	Preparation of borehole sites and reinstatement of borehole sites	No.	1	150	150
4	Provision and erection of temporay fencing to access roads storage and work areas	M	100	0.5	50.0
5	Removal of fencing on completion	Sum	Lump		
6	Transport rig, plant, materials, equipment etc. between sites set up and dismantle rig, plant, equipment etc. at each borehole (per borehole)	No.	1	525	525
7	Drill 203mm minimum diameter hole from ground level to a maximum of 70m include for geological sampling, penetration rate and sampling	M	70	120	8,400
8	Supply and Install 125mm diameter PVC Casing	M	31	32	992
9	Supply and Install 125mm diameter PVC screen	No.	39	36	1,404
10	Supply and install gravel Pack	No.	1	450	450
11	Supply grout and place as sanitary seal above gravel (Cement for Backfilling Dry borehole)	No.	10	15	150
12	Cleaning, Development of borehole by airlifting	Hr	4	70	280
13	Transport plant for pump testing between sites, set up and dismantle at each sites	No.	1	250	250
14	Carry out step testpump testing with pump specified, incude for disposal of discharged water (per Hour of pumping)	Hr	4	100	400

Item	Requirement	Unit	Quantity	Rate(US\$)	Amount(US\$)
15	Carry out recovery tests as specified. (per Hour)	Hr	1	50	50
16	Carry out pump testing with pump as specified, include for disposal of discharged water (per Hour of pumping)	Hr	12	80	960
17	Supply and Install well head as specified, Seal annular space between casing and conductor pipe, include for cement to set	No	1	200	200
18	Provide containers and collect water samples	No	1	1	1
19	Measure and record EC, Eh and pH during pump testing and development.	Lump	Sum		50
20	Prepare and deliver to the Project Manager, borehole reports as 2 copies per report in the manner specified.	No	1	50	50
21	Standing time (per rig hour) Rate only				14,362
TOTAL					

P1	Supply and install minimum diameter 200mm inside diameter galvanised steel conductor casing as specified, include for centralisers and all other fittings as specified	No rate only	40		Not required
P2	Cement annular space between conductor casing and hole. Include for waiting time for cement to set (per borehole)	No rate only	4		Not required
P4	Carry out geophysical logging as specified	No rate only	4		Not required

Edal Drilling Company Limited 49 Waterloo Street Sierra Leone, Freetown

Geography ref: No.
Successful Day

BOREHOLE RECORD

Client: REGENT		BH ref. No: BH-04		Nat. grid ref:	
Drilling contractor: Edal Drilling Company		Drill rig: Super DTH		Method: Mud Drilling/Air Drilling	
Drilling start date: 30th Nov 2009		Compl. date: 03rd Dec 2009		Operator: Raju Govindaraju	

TEST PUMPING		Date: 6th Jan 2010		Top of screen * 23 m	
Dynamic WL * 29.25m		Pump type: Pedrollo		Static WL * m	
Static WL * 3.08m		Pumping rate (Q): 925.2 m³/h		Potential drawdown m	
Drawdown (d): 26.18m		Duration: 12 HRS		Potential yield 160 l/m	
Specific capacity (Q/s): 35.34 m³/h/m		Depth of borehole * 70 m			

* Levels to ground level datum

BIT SIZE & TYPE	TIME/DEPTH M/MIN	PROFILE	WATER ZONES CUMULATIVE Q (l/min)	WELL DIAGRAM with STATIC AND DYNAMIC WATER LEVELS	SCALE
12" Step Bit (304mm)		Weather lateratic gabbro			5
Mud drilling			10		
			15		
			20		
			25		
8.5" DTH (203mm) Air drilling		Moderatly weather granite with collaborate with quartzite vein		30	
			35		
			40		
			45		
			50		
			Slightly Hard gabbro	55	
		60			
		65			
		70			
		75			
		Moderatly weathered granite with more quartzite veins		137	
			160		
			160		
			157		
		Gabbro			

Gravel for gravel pack

Cement for grouting

Bentonite for grouting

Installation of grout seal

Cleanling & development

Centralisers fitted

Safety cap fitted

Backfill aband. BH

Disinfection date

Platform construct. date

Platform transport adjust.

Cut access to site

App.9-2.1

59	M
400	KG
10	KG
4	M
	HRS
Yes	No
Yes	No
Yes	No
	KM
	KM

Remarks: Successful Borehole

Prepared by: Edal Drilling Company (Contractor)

Certified: (Consultant)

Approved:

Approved:

EDAL DRILLING COMPANY LIMITED

BOREHOLE DEVELOPMENT FORM

Community: REGENT

Date: 1st Dec 2009

Location Code:

Opposite Mami Fatu House

Tested by: EDAL DRILLING CO LTD

Boreholes Ref No: 8

BH - 04

Ht. of datum 0.67m

Type of Test ☒ Step drawdown
☐ Constant discharge

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

Depth 70m

Static water level 4.78

Total time of development 4Hrs

Time		Position of pipe BGL	Yield lpm	Pressure bar	Observations
From	To				
10:00am	11:00am	69	145	14	Muddy water lifted
10:16	11:16	56	160	14	Clear water with sand particles
11:25	12:25	46	168	14	Clean water
12:40	13:40	69	178	14	Very clear water lifted

DAILY LOG FOR DRILLING SUPERVISION

CONTRACT		REAGENT		WELL BH - 04		DATE	30 - 31/11/2009
LOCATION CODE:						CONTRACTOR	Edal Drilling bCompany Limited
START OF		END OF WORKING HR: 3:48PM				WEATHER	Shinning
TIME: 8:57:10:15		WORKING HR				DURATION OF	
DATE: 30/11/09						RAINFALL	
DEPTH OF HOLE (M)		70M				GEOPHYSICS	RGT/BH - 04
DEPTH CASED(M)		70M				REF. POINT	
LITHOLOGICAL BOUNDARIES AND SAMPLES OF FORMATION							
DEPTH OF		DRILLING PROCESS			DESCRIPTION OF FORMATION		YIELD
CONTACT ZONE							REMARKS(Drilling Method including change of Bit)
DEPTH	SAMPLE	FROM	TO	SPEED			
0 - 5	5	11:49	11:57	1.6	Weathered Literitic gabbro		Started with 10"
					"		DTH to 11m
					"		and cont. 8" DTH
5 10	10	3:14	3:20	1.2	"		to 70m by air
					"		drilling
					Moderatly weathered granite with		
10 15	15	10:21	10:36	3	collaborate with quartzite vein		
					"		
					"		
15 20	20	10:40	10:51	2.2	"		
					"		
					"		
20 25	25	10:55	11:10	3	"		
					"		
					"		
25 30	30	11:21	11:35	2.8	"		
					"		
					"		
30 35	35	11:41	11:54	2.6	"		137
					"		
					Slightly hard gabbro from 37m to 44m		
35 40	40	11:56	12:10	2.8	"		
					"		
					"		
40 45	45	12:14	12:30	3.2	Moderatly weathered granite with		160
					more quartzite vein to 67m		
					"		
45 50	50	12:36	12:48	2.4	"		
					"		
					"		
50 55	55	12:53	1:08	3.4	"		
					"		
55 60	60	1:13	1:23	2.0	"		
					"		
					Gabbro		
60 65	65	1:27	1:38	2.2	"		160
65 70	70	1:45	1:58	2.6	"		157

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

Community: (REGENT

Date: 09TH Dec 2009

Location Code: (Opposite Mami Fatu House

Tested by: EDAL DRILLING CO LTD

Boreholes Ref No: BH - 04

Ht. of datum	0.67
above GL(m)	

Datum level	x	Top of casing
		Base slab
		Other Specify

Depth 70m

Static water level 2.54

Pump setting 40m

[illegible]

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

Community: (REGENT

Date: 09th Dec 2009

Location Code: (Opposite Mami Fatu House

Tested by: EDAL DRILLING CO LTD

Boreholes Ref No: BH - 04

Ht. of datum 0.67m
above GL(m)

Datum level	x	Top of casing
		Base slab
		Other Specify

Depth 70m

Static water lev 2.54

Pump setting 40m

[illegible]

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

Date: 09th Dec 2009

Tested by: EDAL Drilling Co. Ltd

Ht. of datum above GL(m) 0.67

Depth 70m

Pump setting 40m

Datum level x	Top of casing
	Base slab
	Other Specify

Static water level	2.54
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<input checked="" type="checkbox"/>	Top of casing
<input type="checkbox"/>	Base slab
<input type="checkbox"/>	Other Specify

RECOVERY

RECOVERY					RECOVERY				
Time	Time since pumping began(min)	Discharge rate(lprm)	Water level below datum(m)	Draw-down (m)	Time	Time since pumping began(min)	Discharge rate (lprm)	Water level below datum	Drawdown (m)

RECOVERY

[illegible]

SIERRA LEONE GUMA VALLEY WATER COMPANY
12HRS Borehole Pump Test - Constant Discharge Period (MECHANIZED)

Community: REGENT

Date: 6th Jan 2010

Location Code: Opposite Mami Fatu House

Tested by: EDAL DRILLING CO LTD

Boreholes Ref No: BH - 04

Ht. of datum above GL(m) 1.88m

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

Depth 70m

Static water level 3.08

Pump setting 38m

CONSTANT DISCHARGE					CONSTANT DISCHARGE				
Time	Time since pumping began(min)	Discharge rate (l/m)	Water level below datum (m)	Drawdown (m)	Time	Discharge Rate (l/m)	Time since pumping began(min)	Water level below datum	Drawdown (m)
10:35	0	300	3.08						
	1	300	9.23	6.15	15:35	257	420	29.23	26.15
	2	300	12.80	9.72	16:35	257	480	29.24	26.16
	3	300	14.57	11.49	17:35	257	540	29.25	26.17
	4	300	15.93	12.85	18:35	257	600	29.25	26.17
	5	300	17.50	14.42	19:35	257	660	29.25	26.17
	6	300	18.91	15.83	20:35	257	720	29.26	26.18
	7	300	19.35	16.27					
	8	300	20.74	17.66					
	9	300	21.36	18.28					
	10	300	22.11	19.03					
	15	300	24.00	20.92					
	20	300	24.11	21.03					
	25	300	27.20	24.12					
	30	300	28.02	24.94					
	35	300	29.00	25.92					
	40	300	29.05	25.97					
	45	300	29.07	25.99					
	50	300	29.08	26.00					
	55	300	29.09	26.01					
11:35	60	300	29.10	26.02					
	75	225	29.12	26.04					
	90	225	29.42	26.34					
	105	225	29.42	26.34					
12:35	120	225	29.42	26.34					
	135	225	29.05	25.97					
	150	257	28.91	25.83					
	165	257	28.92	25.84					
13:35	180	257	28.91	25.83					
	210	257	28.91	25.83					
14:35	240	257	28.92	25.84					
	270	257	28.93	25.85					
15:35	300	257	28.93	25.85					
	330	257	28.94	25.86					
14:35	360	257	28.95	25.87					

SIERRA LEONE GUMA VALLEY WATER COMPANY
6HRS Borehole Pump Test - Recovery Period (MECHANIZED)

Community: REGENT Date: 06th Jan 2010

Location Code: Opposite Mami Fatu House Tested by: EDAL DRILLING CO LTD

Boreholes Ref No: BH - 04

Ht. of datum above GL(m) 1.88m

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

Depth 70m

Static water level 3.08 Pump setting 38m

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)
20:35	0	257	29.26					
	1	257	27.50	24.42		420		
	2	257	25.10	22.02		480		
	3	257	20.80	17.72		540		
	4	257	16.61	13.53		600		
	5	257	13.21	10.13		660		
	6	257	10.70	7.62		720		
	7	257	8.90	5.82				
	8	257	7.83	4.75				
	9	257	7.00	3.92				
	10	257	6.41	3.33				
	15	257	5.35	2.27				
20:55	20	257	4.85	1.77				
	25							
	30							
	35							
	40							
	45							
	50							
	55							
	60							
	75							
	90							
	105							
	120							
	135							
	150							
	165							
	180							
	210							
	240							
	270							
	300							
	330							
	360							