EDAL DRILLING COMPANY LTD.

BOREHOLE DRILLING REPORT

SUBMITTED TO:
KOIDU HOLDINGS

35[A] Clewry's Lane, off Main Motor Road, Congo Cross, Freetown, Sierra Leone
Cell Numbers: 076 204 816/076 601 550 Email: edalltd@gmail.com

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1.0 INTRODUCTION

As a measure to solve the problem of water shortage in Koidu Holdings contracted EDAL Drilling Company Limited, based at 35^{A} Clewry's Lane off Main Motor Road, Congo Cross to drill and construct one (1) borehole. This report presents a summary of field work and tests carried out from the 21st - 24th December, 2015.

2.0 FIELD WORK

2.1 METHODOLOGY OF THE DRILLING PROCESS

The methodology adopted in carrying out the drilling process includes:

i. Mobilization

ii. Borehole drilling-this includes

- Drilling through all sort of formation (consolidated and unconsolidated) for a depth of 100m.
- Supply and installation of casings, plains and screens.
- Develop borehole by surging with compressed air and airlifting test.

iii. Aquifer pumping yield test

iv. Demobilization

2.2 BOREHOLE DRILLING

The drilling rig was positioned on the best drilling point identified from the geophysical sitting results and some feasibility studies. The process was carried out using the 450 OZ Drill Rig and ELGI 1100cfm/350 psi Compressor. The airlift method was used to drill to a maximum depth of 100m. At the end of the drilling, the hole was certified to be successful with its delivery rate ranging from 7.3-20m^{3}/hr. as its constant discharged calculated from the pumping test which was carried out for 8hr of 6hr of pumping and 2hr recovery.

3.0 RESULTS ANALYSIS

The following figures show the drilling and tests results

3.1DAILY LOG FOR DRILLING SUPERVISION

OWNER NAME		DEPTH OF HOLES		100m	
COMMUNITY		WEATHER		Sunny	
RIG MAKE		USE			
COMPRESSOR MAKE		DATE		START DATE: COMPLETION DATE:	21/12/15 23/12/15
BORE-HOLE REFERENCE NO.		DRILLING METHOD		DTH-AIRLIFT	
DEPTH OF CONTACT ZONE		DESCRIPTION OF FORMATION		REMARKS(Drilling Method including change of bit)	
DEPTH (m)	SAMPLE	FROM	TO		
5	5	8.21	8.24	1.6	Brownish – red laterite (0-8m)
10	5	8.25	8.27	2.5	Weathered - Granite
15	5	9.29	9.37	0.62	Hard Pink Granite
20	5	9.58	10.19	0.23	
25	5	10.59	10.39	0.25	
30	5	10.41	11.00	0126	
35	5	11.02	11.23	0.25	Hard Diorite
40	5	13.14	13.32	0.27	First strike of water:39m
45	5	13.35	13.52	0.29	Pink Granite
50	5	14.05	14.25	0.25	Fracture:39-42m
55	5	8.31	8.50	0.26	Pink Granite
60	5	8.52	9.09	0.29	Fracture 50-60m
65	5	9.10	9.30	0.25	Pink Granite
70	5	9.31	9.47	0.31	" " " "
75	5	9.48	10.05	0.29	
80	5	10.67	10.23	0.31	" " "
85	5	12.39	12.57	0.27	Fracture 87-93m & 95-98m
90	5	13.09	13.28	0.26	
95	5	13.31	13.52	0.23	Pink Granite
100	5	13.54	14.21	0.18	

3.2 CASING AND BOREHOLE COMPLETION

Casing Material : **METAL AND POLY-VINLY CHORIDE (PVC)**

Casing Joints: **THREADED**

TEMPORAL METAL CASING			
From(m)	To(m)	Diameter (mm)	Type
+0.6m	8m	275 mm THROUGHOUT	METAL STEEL CASSING

PERMANENT UPVC CASING					SCREEN AND PLAIN
TYPE OF PVC	From (m)	To (m)	Diameter ☐ mm	Type	Slot Size
Plain	0.5	39	152.4mm THROUGHOUT	PVC	0.75mm THROUGHOUT
Screen	39	42			
Plain	42	60			
Screen	60	69			
Plain	69	75			
Screen	75	81			
Plain	81	87			
Screen	87	90			
Plain	90	96			
Screen	96	99			
Bottom plug	99	100			

Upper Grouting: Cement - +0.6-3m
Lower Grouting:-18-20m

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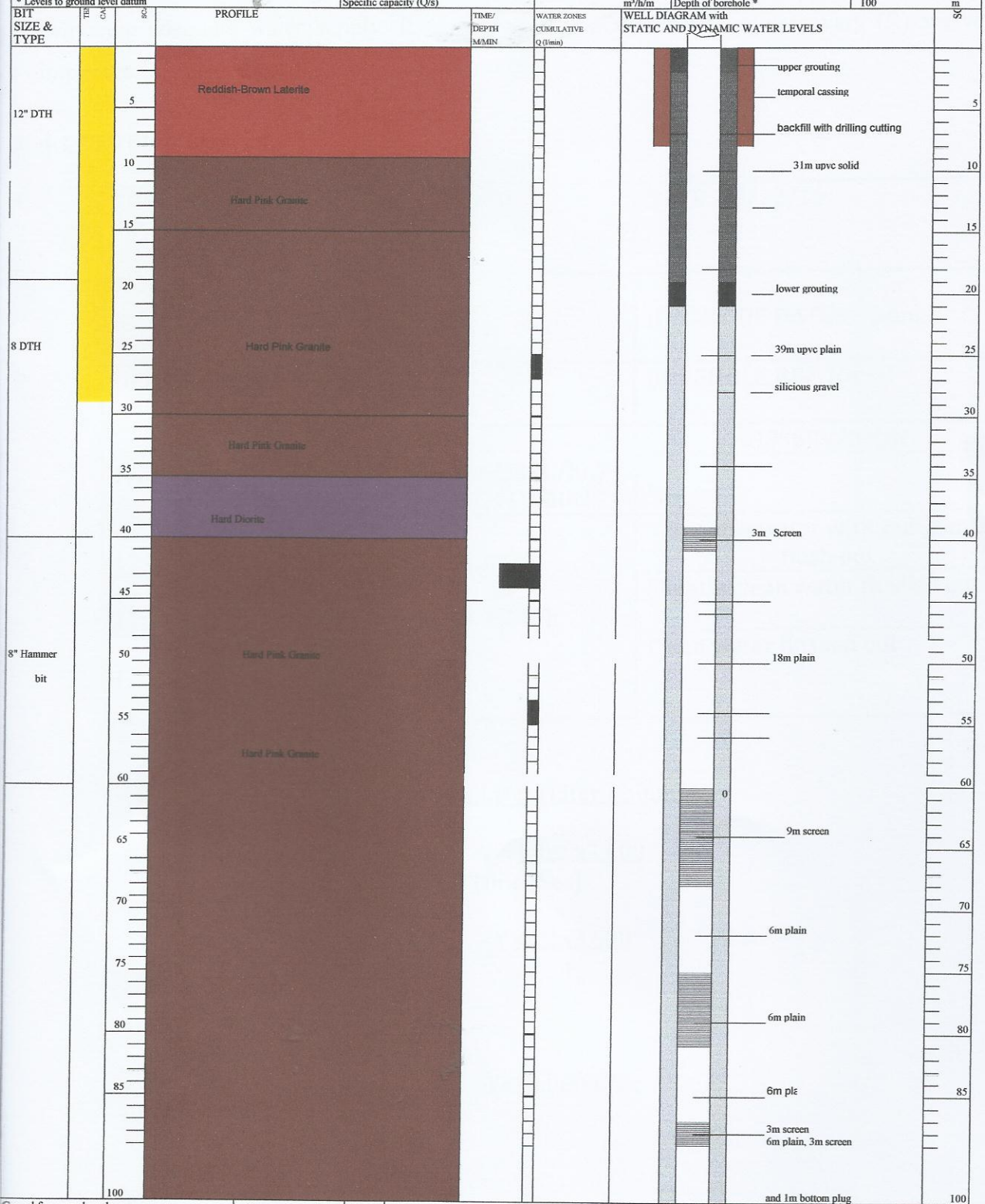
Geophysics ref.No. VES

BH status: Successful / Dry

BOREHOLE RECORD-FOREDUGU

Community:	Koidu Holdings	BH ref. No.	BH - 01	Nat. grid ref.	
Drilling contractor	Edal Drilling Company	Drill rig	PRD OZ 350	Method	Air Drilling
Drilling start date	21/12/15	Compl. date	23/12/15	Operator	Vivion kodjo

TEST PUMPING					
Dynamic WL *	10.78	Pump type	Pedrollo	Top of screen *	39 39 m
Static WL *	10.02	Pumping rate (Q)	7.3 m³/h	Static WL *	10.02 m
Drawdown (s)	0.76	Duration	6 hrs	Potential drawdown	m
* Levels to ground level datum		Specific capacity (Q/s)	m³/h/m	Potential yield	m³/h
				Depth of borehole *	100 m



Gravel for gravel pack		20	M	
Cement for grouting		50	KG	
Bentonite for grouting			M	
Installation of grout seal		20	M	
Cleaning & development		2hr15min	HRS	Prepared by: Edal drilling Company (Contractor)
Centralisers fitted	Yes	No	x	
Safety cap fitted	Yes	x No		Certified:
Backfill aband. BH	Yes	No		
Disinfection date				Approved:
Platform construct. date				
Platform transport adjust.			KM	Approved:
Cut access to site			KM	

4.0 BORE HOLE DEVELOPMENT

Borehole development entails making the discovered aquifer (fracture) more efficient in delivering adequate water supply. Rate of discharge (Q) and recharge/recovery (R) are very important factors in the development of a borehole.

4.1 DEVELOPMENT FORM

<table>
<tr><td colspan="3">COMMUNITY: KOIDU HOLDINGS</td><td>DATE: 23/12/15</td></tr>
<tr><td colspan="3">TYPE OF TEST: Air-Lifting</td><td>HEIGHT OF DATUM: 0.6m</td></tr>
<tr><td colspan="3">DEPTH: 100m</td><td>BOREHOLE REF. No: 01</td></tr>
<tr><td colspan="2">TIME</td><td rowspan="2">YIELD m^3/h (L/hr.) DURING FLUSHING</td><td>OBSERVATION</td></tr>
<tr><td>From</td><td>To</td><td></td></tr>
<tr><td>12:10</td><td>12:20</td><td rowspan="3">$18m^3/h$
or
18,000L/h</td><td>Reddish water with sediments flush out</td></tr>
<tr><td>12:20</td><td>12:26</td><td>Slightly clean water flushed out</td></tr>
<tr><td>12:26</td><td>13:48</td><td>Clean water flushed out</td></tr>
</table>

YIELD : (Liter / hour)

$$Y = \frac{\text{Liter x3,600}}{\text{Time (Sec)}}$$

$$Y = \frac{21 \times 3,600}{4}$$

$$Y = 18,000 \text{ L/hr}$$

EDAL DRILLING COMPANY LIMITED

Community: Koidu Holdings

Date: 24/12/2015

Tested by: EDAL DRILLING COMPANY Ltd

Borehole Ref. No.

Ht. of datum above GL(m): 0.5

Datum level: ☐ Top of casing

Depth: Approx.: 100m

Static water level: 10.02

Pump setting: 90m

Time Minute	Water level below datum(m)	Cumulative drawdown(m)	Discharge (m^3/h)	Recovery (m)	Observation
1	10.06	0.03		10.60	Slightly clean
2	10.09	0.01		10.48	
3	10.10	0.01		10.32	
4	10.11	0.01		10.28	
5	10.11	Nil		10.21	
10	10.15	0.04		10.19	
15	10.19	0.04		10.17	Purely clean and cool
20	10.19	Nil		10.16	
25	10.20	0.01		10.15	
30	10.20	0.03		10.13	
35	10.23	0.01		10.12	
40	10.24	Nil		10.10	
45	10.24	0.02		10.09	
50	10.26	0.02		10.08	
55	10.26	0.02		10.08	
60	10.28	0.02		10.08	
70	10.30	0.02	7.3 m^3/hr	10.07	
80	10.32	0.02		10.07	
90	10.34	0.01		10.06	
100	10.35	0.03		10.06	
110	10.38	0.02			
120	10.40	0.04			
140	10.44	0.03			
160	10.47	0.03			
180	10.50	0.05			
210	10.55	0.05			
240	10.59	0.04			
270	10.65	0.06			
300	10.71	0.06			
330	10.75	0.04			
360	10.78	0.03			

Mohamed Mansaray
Installation Technician

Sustainable rate:	24hrs
Pumping time:	6hrs
Resting time:	2hrs
Flow rate:	7.3m^3/h
Borehole strength:	7.2-18 m^3/hr

8.0 RECOMMENDATION AND CONCLUSION

1. From the pumping test results and analysis, the borehole is successful and sustainable. To maintain the life span of the hand pump, we advise a pumping time of at most 6hr with a pumping ranging from 7.3-18 m^3/hr. (constant discharge) and a resting time of at least 2hr.

2. EDAL Drilling Company Limited will be responsible for borehole repair and rehabilitation in the case of damage due to construction/technical defects for a period of **SIX (6) MONTHS**. However, EDAL Drilling Company Limited will not be responsible for any damage caused as a result of misuse.

SUMITTED BY:

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