

ICE13060010/024-1



**Annex 1**

**Project Document**

**Capacity Building and Technical Assistance  
for Geothermal Drilling in Rwanda**

Sub-Project of the Geothermal Exploration Project

ICE23066-1301

**Implementing Agency: The Energy Water and Sanitation Authority (EWSA) in Rwanda**

Funded by ICEIDA/NDF Geothermal Exploration Project

Budget: 850.000 USD



## Table of Contents

TABLE OF CONTENTS .....	2
1. INTRODUCTION .....	3
2. BACKGROUND AND RATIONAL .....	3
3. PROJECT DESCRIPTION .....	4
3.1. STRATEGY .....	4
3.2. OBJECTIVES .....	4
3.3. OUTPUTS .....	4
3.3. CROSS CUTTING ISSUES – GENDER AND ENVIRONMENT .....	5
4. IMPLEMENTATION AND MANAGEMENT .....	5
4.1. POINTS OF CONTACT FOR THE PROJECT MANAGEMENT: .....	5
4.2. REPORTING AND MEETINGS .....	6
5. INDICATIVE BUDGET .....	6
6. RISK AND ASSUMPTIONS .....	7
7. TIMEFRAME .....	7
8. MONITORING AND EVALUATION .....	7
ANNEX 1 – LOGICAL FRAMEWORK MATRIX .....	8
ANNEX 2 TERMS OF REFERENCE FOR CAPACITY BUILDING FOR GEOTHERMAL DRILLING IN RWANDA FOR THE ENERGY WATER AND SANITATION AUTHORITY .....	9
ANNEX 3 – TERMS OF REFERENCE FOR DRILLING SUPERVISION .....	14
ANNEX 4 – REQUEST FROM EWSA .....	16



## 1. Introduction

The Icelandic International Development Agency (ICEIDA) and the Nordic Development Fund (NDF) are implementing a project to support geothermal exploration and capacity building in East Africa. ICEIDA is the Lead Agency in the Geothermal Exploration Project with joint co-financing of NDF. The project is the initial phase of the Geothermal Compact partnership, initiated jointly by Iceland and the World Bank.

The main objective of the Geothermal Exploration Project is to assist countries in East Africa to enhance geothermal knowledge and capacity in order to enable further actions on geothermal utilization in the respective countries. This includes completing the exploratory phase of geothermal development and build capacity and expertise in the field of geothermal utilization and related policy. Support for geothermal development is outlined as a priority area in the Strategy for Iceland's Development Cooperation. As stated in the Project Document, the United Nations University – Geothermal Training Programme (UNU-GTP) is a key partner in the project relating to geothermal training and capacity building.

The objective of this sub-project is to build capacity within the Energy Water and Sanitation Authority (EWSA) in Rwanda to monitor and administer various scientific and practical aspects related to geothermal drilling activities and ensuring that analysis provide the necessary information for the progress and decision-making associated with the drilling. At the end of the project it is expected that the targeted staff of EWSA will have gained knowledge and skills to effectively administer and monitor geothermal drilling. Additional support will also be provided for EWSA for supervision of drilling.

The implementation of this Project Document is subject to the Partnership Agreement between EWSA and ICEIDA for the Geothermal Exploration Project.

## 2. Background and Rational

In Rwanda, the geothermal potential has been estimated to be more than 700 MW of which the GoR targets to develop over 300 MW for electricity generation and also focus on direct uses of geothermal energy to spur economic development in rural areas.

The Geothermal Exploration Projects is demand-driven and activities funded by the project are based on specific needs and requests from governments in the countries of the region. In October 2012 The Government of Rwanda expressed an interest in participating in the project. The Energy Water and Sanitation Authority (EWSA) is the agency responsible for geothermal development in the country. Currently, the Government of Rwanda through EWSA is implementing the exploration and development of the geothermal resource, including a project to establish the viability of geothermal resources by drilling three exploration wells in Karisimbi geothermal prospect area.

To achieve its target related to geothermal drilling, GoR has awarded contracts for the supply of drilling materials and drilling services in early 2012 to the China Petroleum Development and Technology Corporation (CPTDC) and Great Wall Drilling Company, respectively and preliminary infrastructure works are on-going. The drilling supervision of the Karisimbi project will be carried out by Reykjavik Geothermal Company (RG) from Iceland funded by the Nordic Development Fund.



After initial discussion between ICEIDA and authorities in Rwanda a specific request was submitted from EWSA, outlining the need for support to capacity building relating to the planned geothermal drilling project in Karisimbi as well as technical assistance for additional support for drilling supervision. As noted above, NDF is also funding activities carried out by Reykjavík Geothermal (RG), aimed at coordinating all the drilling activities and develop an emergency development plan for the Karisimbi drilling project. The activities outlined in this document are additional and complementary to the services provided by RG.

The main challenges identified by the EWSA in implementation of the geothermal drilling has been the lack of skills and capacity related to drilling monitoring and analysis related to drilling activities as well as inadequate resources for the drilling supervision. This project aims to address these needs through capacity building and technical assistance to EWSA.

### 3. Project description

#### 3.1. Strategy

1. For the purpose of providing technical capacity building support to EWSA within the scope of the Geothermal Exploration Project, the UNU-GTP will implement a training program tailored to the requirements of EWSA, as requested in a Concept Note submitted by EWSA.
2. To contribute towards successful implementation of drilling activities the project will additionally provide support for technical assistance for drilling supervision for a period of 9 weeks. This is important in order to ensure that boreholes are produced as designed and data collected, recorded and reported accurately, in particular in the drilling of the first well.

#### 3.2. Objectives

The **overall objective** of this project is to assist the Government of Rwanda to increase their renewable energy access through low emissions geothermal energy development for the social and economic benefit of the country.

The **immediate objective** of this project is to equip EWSA with resources, knowledge, skills and equipment to effectively administer and monitor geothermal drilling.

At the end of the project it is expected that the targeted staff of EWSA will have gained knowledge and practical skills to effectively administer and monitor relevant scientific and practical aspects of geothermal drilling.

#### 3.3. Outputs

The expected outputs from this project are the following:

1. **Increased capacity for monitoring and supervision for geothermal drilling at EWSA**
  - 1.1. Short Course conducted in Kigali for EWSA staff with evaluation of participants performance.
  - 1.2. EWSA borehole geologist trained and evaluated
  - 1.3. EWSA drilling engineer trained and evaluated
  - 1.4. EWSA chemist trained and evaluated
  - 1.5. EWSA environmental scientist trained and evaluated

- 1.6. Equipment for geothermal monitoring and analysis purchased based on needs assessment
- 1.7. All trainees have received certificates in line with the training they have received.
- 1.8. Training report with assessments of trainees and main challenges identified.

## 2. Support for technical assistance in drilling supervision

- 2.1. Experienced drilling supervisor contracted by EWSA for a period of 9 weeks

Each of the project components listed above, is further defined in the Terms of Reference in Appendix 2 and 3, respectively.

### 3.3. Cross cutting issues – Gender and Environment

Gender ratio of trainees will be observed, an application from a female trainee for the UNU-GTP 6 months program will be encouraged.

An Environmental and Social Impact Assessment has been conducted for the Karisimbi Geothermal Project. The project will adhere to environmental and safety instructions which have been prepared.

## 4. Implementation and Management

EWSA is the implementing agency, and to this effect a partnership agreement has been signed between EWSA and ICEIDA to which this project is subject to.

The capacity building component will be carried out by the UNU-GTP according the Terms of Reference and based on the Concept Note from the EWSA regarding the required support.

An experienced drilling supervisor will be hired and managed by EWSA to carry out duties in accordance with the ToR. EWSA is responsible for signing an agreement with the consultant for drilling supervision, subject to ICEIDA's prior approval. All invoices for the work of the drilling supervisor must be formally approved by EWSA prior to submission.

The Government of Rwanda and EWSA will make the required logistical arrangements and make available the required permits for the UNU-GTP and other contractors to carry out the work according to plans. EWSA will further ensure that:

- UNU-GTP and other contractors have access to the necessary documents related to the drilling activities in order to conduct project activities effectively.
- It has available qualified staff available to undertake the training.
- Transportation, lodging and meals are provided in relation to project activities.

ICEIDA is responsible for funding project activities and will disburse all funds directly to suppliers of goods and services in accordance with the respective agreements.

The responsibilities of the parties are further stipulated in the Partnership Agreement.

### 4.1. Points of Contact for the Project Management:

#### For EWSA

Uwera Rutagarama

Tel.: 078 835 0132

Extension: 1654

Email: [urutagarama@ewsa.rw](mailto:urutagarama@ewsa.rw)

Alternative email: [uwera.ruta@gmail.com](mailto:uwera.ruta@gmail.com)

**For ICEIDA**

David Bjarnason

Programme Manager

Email: [david@iceida.is](mailto:david@iceida.is)

Tel: +354 5457974

**4.2. Reporting and meetings**

EWSA and ICEIDA shall establish regular communication through the points of contact regarding the progress of project activities. This may involve visits from ICEIDA/NDF to the project site and meetings with EWSA regarding the progress of implementation.

ICEIDA shall be provided with quarterly progress reports from EWSA for the Project under this Agreement. In addition, ICEIDA shall receive such other information from EWSA regarding the implementation and administration of the Project as ICEIDA shall reasonably request.

EWSA shall produce and submit to ICEIDA a completion report within 6 months of the completion of the Project.

**5. Indicative Budget**

The project will be carried out in accordance with the indicative budget provided below:

Output/Activity	Estimated USD
<b>1. Capacity Building for Geothermal Drilling in Rwanda</b>	
1.1. One week short course on geothermal drilling for EWSA staff	30.000
1.2. On-site capacity building program for geothermal drilling (for a period of 6 months, with a total of 12 ½ working months as input).	463.000
1.2.1. Flights	40.000
1.2.2. Accommodation	12.000
1.3. UNU-GPT 6 months course for one (1) EWSA geothermal expert (Funded by ICEIDA)	40.000
1.4. Equipment for geothermal analysis and monitoring according to needs assessment (estimated)	150.000
1.5. Chemical sampling and analysis (Estimated)	15.000
<b>2. Technical assistance for drilling supervision</b>	
2.1. Consultation fees and travel for drilling supervisor for a total of (9 weeks)	100.000
<b>Estimated total USD:</b>	<b>850.000</b>

\*Based on exchange rate of ISK 124.14 for 1 USD

## 6. Risk and Assumptions

There is considerable uncertainty regarding the results of geothermal exploration drilling. This needs to be taken into account with the implementation of the planned training activities.

- It is assumed that various issues can interfere with the drilling which may result in unexpected delays. Thus a flexible schedule is required and has been taken into account in the planning of activities in this project.
- It is assumed that qualified staff are employed at the EWSA to undertake the training.
- That an experienced drilling supervisor is available to perform the duties as outlined in the ToR.
- The candidate for the UNU-GTP fellowship in Iceland needs to fulfil similar conditions as other candidates for training at UNU-GTP in Iceland.

## 7. Timeframe

- The expected timeframe of this project for a total period of 6 months, expected to start around June 2013. This time may get delayed for reasons listed above. EWSA is required to confirm the start date of drilling with UNU-GTP three weeks in advance, in order for the training to start concomitantly.
- The planning needs to take into account the progress of drilling and any delays which may occur.
- Any delays in project implementation should be communicated to ICEIDA as soon as possible.

## 8. Monitoring and Evaluation

Monitoring of project activities will be carried out through quarterly progress reports from EWSA, reports from UNU-GTP and with site visits from ICEIDA. The training program and all trainees will be independently evaluated by the UNU-GTP and all such evaluations will be assessed by the ICEIDA monitoring and evaluation unit in relation to a framework for evaluations of capacity building activities. The performance of the consultant for drilling consultant shall be assessed by EWSA and reported to ICEIDA.

An external evaluation of the geothermal support to Rwanda will be carried out, supervised by ICEIDA Head of Monitoring and Evaluation, 6 months after support to activities in Rwanda has come to an end.

## Annex 1 – Logical Framework Matrix

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Assumptions/Risks
<b>Overall Objective (Impact) (Geothermal Compact)</b>			
Assist the Government of Rwanda to increase access to renewable energy through low emissions geothermal energy development.	<ul style="list-style-type: none"> <li>MWs of geothermal energy produced in Rwanda (10-15 years).</li> </ul>	<ul style="list-style-type: none"> <li>Installed capacity of geothermal power plants.</li> </ul>	
<b>Immediate Objective (Outcome)</b>			
EWSA staff has knowledge, resources, skills and equipment to effectively administer and monitor geothermal drilling	<ul style="list-style-type: none"> <li>EWSA staff capable of monitoring and supervising drilling activities</li> </ul>	<ul style="list-style-type: none"> <li>Training reports and assessment of performance</li> </ul>	<ul style="list-style-type: none"> <li>Qualified staff available for training</li> <li>Drilling operations according to plans</li> </ul>
<b>Expected Results (Outputs)</b>			
<b>2. Increased capacity and equipment for monitoring and supervision for geothermal drilling established at EWSA</b>			
1.1. Short Course conducted in Kigali for EWSA staff with evaluation of participants performance.	<ul style="list-style-type: none"> <li>Improved overall knowledge of the geothermal drilling process of the GDU</li> </ul>	<ul style="list-style-type: none"> <li>Training report</li> </ul>	
1.2. EWSA borehole geologist trained and evaluated	<ul style="list-style-type: none"> <li>Performance of borehole geologist</li> </ul>	<ul style="list-style-type: none"> <li>Training report</li> </ul>	<ul style="list-style-type: none"> <li>Drilling according to schedule</li> </ul>
1.3. EWSA drilling engineer trained and evaluated	<ul style="list-style-type: none"> <li>Performance of drilling engineer</li> </ul>	<ul style="list-style-type: none"> <li>Training report</li> </ul>	<ul style="list-style-type: none"> <li>Drilling according to schedule</li> </ul>
1.4. EWSA chemist trained and evaluated	<ul style="list-style-type: none"> <li>Performance of chemist</li> </ul>	<ul style="list-style-type: none"> <li>Training report</li> </ul>	<ul style="list-style-type: none"> <li>Drilling according to schedule</li> </ul>
1.5. EWSA environmental scientist trained and evaluated	<ul style="list-style-type: none"> <li>Performance of environmental scientist</li> </ul>	<ul style="list-style-type: none"> <li>Training report</li> </ul>	<ul style="list-style-type: none"> <li>Drilling conducted according to schedule</li> </ul>
1.6. Equipment for geothermal monitoring and analysis purchased based on needs assessment	<ul style="list-style-type: none"> <li>Needs assessment conducted and required equipment operational</li> <li>Staff qualified to operate equipment</li> </ul>	<ul style="list-style-type: none"> <li>Needs assessment report</li> <li>Training report</li> </ul>	<ul style="list-style-type: none"> <li>Availability of equipment</li> </ul>
1.7. Training report produced with assessments of trainees and main challenges identified.	<ul style="list-style-type: none"> <li>Training report</li> </ul>	<ul style="list-style-type: none"> <li>Training report</li> </ul>	
<b>2. Support for technical assistance in drilling supervision</b>			
2.1. Experienced drilling supervisor contracted by EWSA for a period of 9 weeks	<ul style="list-style-type: none"> <li>Consultant carries out tasks in accordance with ToR Reference</li> </ul>	<ul style="list-style-type: none"> <li>Report from EWSA</li> </ul>	<ul style="list-style-type: none"> <li>Experienced consultant available for the task.</li> </ul>



## Annex 2 - Terms of Reference for Capacity Building for Geothermal Drilling in Rwanda for the Energy Water and Sanitation Authority

### Terms of Reference

#### Capacity Building for Geothermal Drilling in Rwanda for the Energy Water and Sanitation Authority (EWSA)

##### Sub-Project of the Geothermal Exploration Project

Carried out by the United Nations University – Geothermal Training Programme (UNU-GTP)  
for EWSA as the Implementing Agency  
with funding from the ICEIDA/NDF Geothermal Exploration Project

### 1. Introduction

The Icelandic International Development Agency (ICEIDA) and the Nordic Development Fund (NDF) are implementing a project to support geothermal exploration and capacity building in East Africa. ICEIDA is the Lead Agency in the Geothermal Exploration Project with joint co-financing of NDF. The project is the initial phase of the Geothermal Compact partnership, initiated jointly by Iceland and the World Bank.

The main objective of the Geothermal Exploration Project is to assist countries in East Africa in completing the exploratory phase of geothermal development and build capacity and expertise in the field of geothermal utilization and related policy. As stated in the Project Document, the United Nations University – Geothermal Training Programme (UNU-GTP) is a key partner in the project relating to geothermal training and capacity building.

The project is demand-driven and activities funded by the project are based on specific requests from governments in the countries of the region. In October 2012 The Government of Rwanda expressed an interest in participating in the project. The Energy Water and Sanitation Authority (EWSA) is the agency responsible for geothermal development in the country. Currently, the Government of Rwanda through (EWSA) is implementing the exploration and development of the geothermal resource, including a project to establish the viability of geothermal resources by drilling three exploration wells in Karisimbi geothermal prospect area.

After initial discussion between ICEIDA and authorities in Rwanda a specific request was submitted from EWSA, outlining the need for support to capacity building relating to the planned geothermal drilling project in Karisimbi.

The implementation of this ToR is subject to the Partnership Agreement between EWSA and ICEIDA for the Geothermal Exploration Project.

### 2. Objectives

The objective of this project is to build capacity within the GDU team at EWSA to monitor and administer relevant scientific and practical aspects related to geothermal drilling activities and

ensuring that analysis provide the necessary information for the progress and decision-making associated with the drilling.

At the end of the project it is expected that the targeted staff of EWSA will have gained knowledge and skills to effectively administer and monitor geothermal drilling.

### 3. Scope of work

For the purpose of providing technical capacity building support to Rwanda within the scope of the Geothermal Exploration Project, the UNU-GTP will implement a training program tailored to the requirements of EWSA, as requested in a Concept Note submitted by EWSA, and outlined below. Funding for the project activities is provided from the Geothermal Exploration Project with ICEIDA as the Lead Agency.

In collaboration with the EWSA the UNU-GTP will carry out the following activities to reach the objectives of this capacity building project:

#### 1. Short course on geothermal development

A start-up one week Short Course on geothermal development in Kigali, with 3-4 expert trainers. This course is intended for the geothermal staff of EWSA. The topic will cover most aspects of geothermal exploration with an emphasis on deep exploration of geothermal systems.

#### 2. On-site advanced training

On-drillsite advanced training and guidance in relation to the Karisimbi project will follow directly after the Short Course for the GDU team at EWSA. UNU-GTP trainers will ensure that EWSA staff receive the required training to carry out the relevant analysis required to decisions making related to the drilling. This is estimated to span a period of 6 months, with a total input of 13 months from trainers. This will include the assistance of the following Expert Trainers, who will train the counterparts within EWSA.

1. Borehole Geologist
2. Drilling Engineer,
3. Chemist
4. Environmental Scientist

During the periods when expert trainers are not on-site, EWSA staff/trainees will be working in accordance with schedule and plans made by the expert trainers. The work carried out in the absence of trainers will be reviewed by the trainers at a later stage.

#### 3. UNU-GTP 6 months course

One (1) EWSA geothermal expert will be supported to undertake the UNU-GTP six months course in Iceland in 2014 subsequent to training activities in Rwanda.

#### 4. Equipment

UNU-GTP and EWSA staff will jointly make a needs assessment and acquisition plan for the equipment EWSA will require to be able to perform the required scientific analysis and perform oversight duties, starting with equipment that would be needed during this capacity building and

training period. Funding for purchase of equipment will be agreed upon by ICEIDA and EWSA and payment made directly from ICEIDA to suppliers of equipment.

#### 5. Chemical sampling and analysis

Additional work may include chemical sampling and analysis. It will be assessed whether such analysis can be carried out with equipment in Rwanda or needs to be performed at an external laboratory.

#### 4. Implementation and Management

- The work will be carried out by the UNU-GTP according to plan as provided and based on the Concept Note from the EWSA regarding the required support.
- UNU-GTP project manager shall communicate and coordinate regularly with ICEIDA project manager and EWSA project manager, regarding the progress of the training and any challenges encountered. Necessary actions will be implemented to address any challenges.
- After three months of project activities, UNU-GTP, EWSA and ICEIDA will meet to discuss the progress of the project and address any issues encountered.
- The Government of Rwanda and EWSA will make the required logistical arrangements and make available the required permits for the UNU-GTP to carry out the work according to plan.
- EWSA will ensure that UNU-GTP has access to the necessary documents related to the drilling activities in order to conduct the training effectively.
- EWSA will ensure that it has qualified staff are available to undertake the training.
- EWSA is responsible for providing transportation, lodging and meals in relation to project activities.
- UNU-GTP is responsible for all travel arrangements and health related matters for their staff members, according the plan.
- All reporting and deliverables from UNU-GTP are to be written and presented in English.

Points of Contact for the Project Management:

##### For EWSA

Uwera Rutagarama

Tel.: 078 835 0132

Extension: 1654

Email: [urutagarama@ewsa.rw](mailto:urutagarama@ewsa.rw)

Alternative email: [uwera.ruta@gmail.com](mailto:uwera.ruta@gmail.com)

##### For UNU-GTP

Lúðvík Georgsson

Deputy Director

Email: [lsg@os.is](mailto:lsg@os.is)

Tel: +354 569 6000

##### For ICEIDA

David Bjarnason

Email: [david@iceida.is](mailto:david@iceida.is)

Tel: +354 5458980

## 5. Deliverables

3. Short Course conducted in Kigali for EWSA staff with evaluation of participants performance.
4. EWSA borehole geologist trained and evaluated
5. EWSA drilling engineer trained and evaluated
6. EWSA chemist trained and evaluated
7. EWSA environmental scientist trained and evaluated
8. Needs assessment report for required equipment
9. All trainees have received certificates in line with the training they have received.
10. Training report with assessments of trainees and main challenges identified.

## 6. Trainers and Qualifications

The relevant training team from the UNU-GTP will be composed of experts in the following fields of expertise:

- Borehole geology
- Drilling engineering
- Chemistry
- Environmental Science
- Other relevant expertise as may be required

The UNU-GTP is responsible for ensuring that a team of highly qualified trainers are available to carry out the training tasks according to plan. CVs of trainers will be provided. All trainers must possess fluent communication skills in English.

## 7. Indicative Budget

The project will be carried out in accordance with the budget provided by UNU-GTP and agreed on by ICEIDA. The cost of equipment represents an estimated figure based on expected requirements.

Activity	Estimated USD	ICEIDA	NDF
1. One week short course on geothermal drilling for EWSA staff	30.000	15.000	15.000
2. On-site capacity building program for geothermal drilling (for a period of 6 months, with a total of 12 ½ working months as input).	463.000	231.500	231.500
2.1. Flights	40.000	20.000	20.000
2.2. Accommodation	12.000	6.000	6.000
3. UNU-GTP 6 months course for one (1) EWSA geothermal expert	40.000	40.000	0
4. Equipment for geothermal analysis and monitoring according to needs assessment (estimated)	150.000	75.000	75.000
5. Chemical sampling and analysis (Estimated)	15.000	15.000	0
<b>Estimated total USD:</b>	<b>750.000</b>	<b>402.500</b>	<b>347.500</b>

\*Based on exchange rate of ISK 124.14 for 1 USD

## 8. Risk and Assumptions

There is considerable uncertainty regarding the results of geothermal exploration drilling. This needs to be taken into account with the implementation of the planned training activities.

- It is assumed that various issues can interfere with the drilling which may result in unexpected delays. Thus a flexible schedule is required and has been taken into account in the planning of activities in this project.
- It is assumed that qualified staff are employed at the EWSA to undertake the training.
- Work related to drilling monitoring, supervision and consulting is not a part of the work under this ToR.
- The candidate for the UNU-GTP fellowship in Iceland needs to fulfil similar conditions as other candidates for training at UNU-GTP in Iceland.

## 9. Timeframe

- The expected timeframe of the capacity building project is for a total period of 6 months, expected to start around June 2013. EWSA is required to confirm the start date of drilling with UNU-GTP three weeks in advance, in order for the training to start concomitantly. The planning needs to take into account the progress of drilling and any delays which may occur.
- The total presence of expert trainers in Rwanda is expected to be for 13 months, combined.
  - A borehole geologist will be on site as necessary during the project time, for a maximum of 6 months.
  - A drilling engineer, to be on site for about 3 months during the project period, carried out through 3 shifts.
  - A chemist is expected to be on site for about 2 months, carried out in 3 shifts. With presence scheduled in time for the finishing operations of the first well, assuming normal preparations.
  - An environmental scientist is scheduled to be two months on-site, carried out through about 3 shifts, but flexibility will be required.
- On-going support to trainees and project management will be carried out from UNU-GTP headquarters in Iceland during the whole project period.
- Final report for the project shall be delivered by UNU-GTP to EWSA and ICEIDA no later than 2 month after the finalization of training activities.

## Annex 3 – Terms of Reference for Drilling Supervision



Energy Water and Sanitation Authority  
 Avenue du Lac Ihema, PO Box 537 Kigali, Rwanda. Tel: + (250) (0)252573666.  
 Email: ewsa@ewsa.rw, info@ewsa.rw, ewsa@ewsal.rw; Website: www.ewsa.rw

### Terms of references – Drilling Supervisor

#### Background

The Government of Rwanda (GoR) through the Energy, Water and Sanitation Authority (EWSA) is implementing the exploration and development of the geothermal resource. The immediate goal is to establish the viability of geothermal resources by drilling three exploration wells in Karisimbi geothermal prospect area early 2013.

In order to maximize the chances for the successful drilling of the exploration wells, EWSA has contracted Reykjavik Geothermal (RG) to coordinate all the drilling activities and develop an emergency development plan for the Karisimbi drilling project. The services from RG will be funded by a grant of the Nordic Development Fund (NDF) and a Drilling Engineer will be provided for the duration of the drilling project.

To ensure that boreholes are produced as designed and data collected, recorded and reported accurately, good supervision of daily drilling activities is essential. Therefore, considering the lack of skills in drilling supervision within the Geothermal Development Unit in EWSA, EWSA is requesting the assistance of the Icelandic International Development Agency (ICEIDA) in financing an experienced drilling supervisor to assist and work under the supervision of RG Drilling Engineer for a total period of Nine (9) weeks together with EWSA drilling staff.

#### Major Function and Purpose

The drilling Supervisor is accountable for planning and executing all aspects of the drilling program; the health and safety of all operational personnel, and protection of the environment. The drilling supervisor shall be ready to work 12h shift with other drilling supervisors. The drilling supervisor will supervise the drilling contractor and the logistics related to drilling activities. He/she will report directly to the Drilling Engineer. The drilling supervisor will sign a direct agreement with EWSA and He/she will be funded by the ICEIDA/NDF Geothermal Exploration Project. The drilling supervisor shall be available to work on site for a total period of 9 weeks.

#### Major Tasks and Responsibilities

- Manage drilling operations in order to maximize return on exploration expenditure.
- Manage daily activity of drilling operations in accordance with company management systems and legislation.
- Follow up the proper implementation of various operational programs, e.g. drilling, workover, completion, logging, testing, acidizing, etc.

- Directs all well operations expediently, safely and according to accepted industry practices as outlined and specified in the well Drilling or Work over program issued by the Drilling Engineer
- Manage performance of all drilling and associated personnel.
- Implement safety and environmental policies.
- Ensure all documentation for drilling approval is prepared and submitted to the competent authority.
- Monitor drilling engineering parameters to support drilling operation.
- Manage cost control within limits of authority.
- Provide clear stewardship reporting on and as-required and exceptions basis to Company and Operations Manager.
- Observe all company health, safety and environmental instructions, act in a safe manner and avoid unnecessary risks to themselves and others.
- Immediately report any unsafe conditions or activities, dangerous occurrences or injuries in the workplace.
- Drafts the drilling/workover morning report summarizing all rig activities
- Reports directly to the Drilling Engineer

#### **Qualifications and Experience**

- Engineering degree from a recognized university or equivalent related industry experience.
- Minimum 8-10 years of experience in the geothermal industry with a combination of operational and business assignments.
- Minimum 5 years of experience in drilling operations with focus in supervision and management.
- Demonstrated leadership and communication skills.
- Good data management and computer literacy.
- Good communication skills in English



Annex 4 – Request from EWSA



Energy Water and Sanitation Authority  
 Avenue du Lac Ihema, PO Box 537 Kigali, Rwanda. Tel: + (250) (0)252573666.  
 Fax + (250) (0)252573802 Email: [ewsa@rwanda1.com](mailto:ewsa@rwanda1.com) ; Website: [www.ewsa.rw](http://www.ewsa.rw)

07 FEB 2013

Kigali,  
 N°11.07.023/440/13/DIR-DED/Y.M/ur

Mr Engilbert Gudmundsson  
 Director General  
 Icelandic International Development Agency (ICEIDA)  
 125, Reykjavik  
 ICELAND

Dear Sir,

**RE: Request for technical assistance for the Karisimbi geothermal drilling project**

In reference to the discussions held with the ICEIDA team in Kigali on February 4<sup>th</sup> and 5<sup>th</sup>, 2013; we have the honor to forward to your good office the concept note attached herewith for technical assistance for geothermal exploration and development in Rwanda.

As you may know, the Government of Rwanda is planning to start exploratory drilling in Karisimbi early this year and for this purpose, we would like to request your assistance in providing individual experts in drilling engineering, geology, geochemistry and environmental sciences during the drilling activities for the three exploratory wells which are to start by mid April 2013. These experts will assist EWSA on data acquisition, analysis and interpretation, supervision of drilling activities as well as on job training for EWSA staff.

We look forward to hearing from you.

Yours Sincerely,

  
 Yves MUYANGE  
 Director General

**Cc:**

- Hon. Minister of Infrastructure
  - Hon. Minister of State for Energy and Water
  - Permanent Secretary/ MININFRA
- KIGALI**  
 - Mr. Arni Helgason, Programme Director ICEIDA  
**UGANDA**

