



Job Description

Country	Somaliland
Project Holder	Hargeisa Water Agency
Project	Increasing Water Production from Laasdhere Aquifer and Connecting to Existing System at New Geed Deeble Pumping Station.
Fund	Somaliland Development Fund Phase 2
IFA Title	Borehole Drilling Supervisor
Reporting to	HWA Project Manager and SDF2 Secretariat Senior Water Specialist
Duration	6 months renewable contract based on performance
IFA No.	P101-057

1. Background

The Somaliland Development Fund (SDF) was established in 2012 to provide a single vehicle through which development partners could support Somaliland's development goals. The first phase of the SDF was implemented in 2013-2017 and supported the Government of Somaliland (GoSL) filling a critical gap through funding projects that are fully aligned to the National Development Plan (NDP) while at the same time recognizing the role of GoSL in the delivery of basic services.

The Somaliland Development Fund – Phase 2 (SDF2) covers the period 2018-2024. SDF2 is conceived as an inclusive economic development programme. It supports the GoSL in delivering infrastructure that is relevant for inclusive economic development. It focuses on sustainable investments that spur job creation and fast growth, while at the same time laying the foundation for long-term resilience and development, leading to a more stable and peaceful Somaliland. SDF2's ambitions are fully aligned with government priorities as defined in Somaliland's second National Development Plan (NDP2 – 2017-2021) and reflect the priorities set out in Somaliland Vision 2030. The Fund Manager is responsible for the day-to-day management and administration of the Fund.

The objectives of the SDF2 are threefold:

- Support increased inclusive economic growth through investment in productive, strategic infrastructure to enhance economic growth and revenue generation.
- Strengthen and maintain the capabilities of the government of Somaliland to prioritize and manage the sustainable and equitable development of Somaliland's infrastructure.
- Support strong government ownership of development priorities aligned with the National Development Plan.

2. Hargeisa Water Agency project

The SDF has allocated funds to the Hargeisa Water Agency (HWA) for the implementation of Increasing Water Production from Laasdhere Aquifer and Connecting to Existing System at New Geed Deeble Pumping Station Project activities. This project is expected to start in the first quarter of 2020. The project contains four major components:

Component 1:

The first component involves drilling of 4-6 boreholes, design of the wellfield collector system, supply and installation of pipes, fittings, valves, and electromechanical equipment to connect the boreholes to the existing new Geed Deeble Pumping Station (NGDPS).

Component 2:

The second component involves capacity development for HWA to enhance its institutional ability to effectively initiate, deliver, and support the management of investments/projects. Crucial for economic development and value for money being realized as a result of the projects, will be the ability to select investments with comparative strategic economic and social advantage for diverse members of the population and which are resilient to current and future shocks (climate and otherwise).

Component 3:

The third component involves community engagement through creation/enhancing or formation of community water committees in the areas directly affected by the project areas in Hargeisa. The purpose of the water committees will be for disseminating project information and dialogue on project issues, especially the use of the water supply among the different communities in Hargeisa.

Component 4:

The fourth component involves conducting three technical studies: (1) Comparative advantage of investing in rural versus urban water supply projects, based on clear VfM considerations, risk, results, need and other possible financing options; (2) Study on increased accountability on performance and pricing of water in urban water supply systems including pro-poor tariff study; (3) Study on sustainable water provision to Hargeisa looking at the present water demand vs water supply, future water demand and population and city growth prospects and updating of the 2007 HWA masterplan.

3. Background to the assignment

Following the conclusion of a hydro geological and Geophysical Survey, the SDF, on behalf of HWA intends to engage the services of a competent drilling supervisor to undertake supervision of the drilling of the 4-8 boreholes at the identified/georeferenced sites. Production boreholes shall be drilled in the recommended sites or as may be determined by the client and/or Engineer and instructed to the consultant. Drilling will be supervised by a competent drilling supervisor. Supervision shall include geological logging of drilling samples, reporting on daily progress, borehole design, design for installation of the borehole, supervision of installation of borehole screens and casings, development and test pumping, sampling and analysis of water quality, and quality control of all other work done by the Contractor. The consultant shall approve all variations and/or standby charges. Full time availability of the drilling consultant at the site is a must. Invoices submitted by the Contractor are to be certified by the Consultant. The data acquired during drilling and testing shall be analysed and borehole completion report prepared for the production borehole. While overall quality control of the works shall be done by the consultant, attention shall be paid to the following issues pertaining to drilling, installation and test pumping works:

4. General description to the role

The objective of the consulting services is to manage and supervise the drilling contract of 4(four) to 8 (eight) boreholes located in Lasdhure on a day-to-day basis on behalf of SDF and HWA. The aim of the supervisor is to support the client in contract supervision of the drilling works, and contract management for the smooth execution acting as the on-site representative in making decisions for the client. In addition, final certification and verification shall be carried out by the consultant. The supervisor shall carry out quality control and ensure that Works are being carried out as provided for in the contract. The drilling site supervisor shall supervise if the Contractor is following the terms, conditions and specifications as provided for in the drilling contract and make amends only after consulting with the client if different ground conditions are encountered that were not envisaged. The

supervisor will be able to take prompt decision, that no waiting time is incurred for the drillers. The drilling supervisor will use check lists for all major steps.

Therefore, SDF Secretariat is seeking the expertise of a Borehole Drilling Supervisor (BDS), who will be responsible for delivering the above outputs.

5. Main Responsibilities

The main responsibilities/tasks can be summarized as follows:

- Drilling supervision
- Preparation of Borehole completion reports for the borehole.
- Certification of contractor's invoices
- Recommendation of production pump

Details of these responsibilities/tasks are further detailed below.

5.1 Drilling supervision

5.1.1 Borehole Depth and Diameter

The supervisor shall give instructions on the total depth and at what diameter to drill. Should collapsible formations be encountered, installation of telescopic casing shall be decided upon by the Supervisor.

5.1.2 Drilling Method and Process

- The supervisor shall approve or reject all drilling methods and/or any additives to be employed by the Contractor. The site supervisor shall ensure that the contractor follows the standard drilling practice, including making all necessary drilling records correctly and on the spot, and that he/she completes the borehole according to the recommended well design.
- Examine tools, materials, plant and equipment, and approve or reject as appropriate on the basis of the standards. Such instructions shall be provided to the contractor in writing.
- Write instructions to the contractor relating to the management of the contract, the design and development of the water source, or any other relevant matters as and when required. All instructions issued by the drilling supervisor shall be in triplicate and shall be signed by site representatives of both the contractor and site supervisor.
- Ensure that the contractor uses the correct drilling methods, equipment and tools for any site to be drilled as specified. The supervisor shall approve all drilling methods and/or any additives to be employed by the Contractor. Ensuring drilling to recommended depths and diameter; the supervisor shall give instructions on the total depth and at what diameter to drill. Should collapsible formations be encountered, installation of telescopic casing shall be decided upon by the Supervisor.

5.1.3 Sampling

The supervisor shall ensure that representative samples are taken at specified intervals (two - metre) of the strata penetrated and are put into suitable sample bags, labelled with the depth interval, and stored in a position where they will not be contaminated by site conditions or drilling operations. Geological logging will be the responsibility of the Supervisor

5.1.4 Yield estimates during drilling

The supervisor shall continuously monitor air lift yields will be made by the contractor and recorded by the Supervisor. Ensure the borehole driller reads and rates average yields every

3 meters of penetration and as otherwise directed by the supervisor and recorded in the driller's log.

5.1.5 Borehole design

- Ensure borehole design is made by the drilling contractor after drilling completion. The design shall ensure that aquifer zones are completely or partially lined with mild steel plain casing and stainless-steel continuous slot screen as decided and approved by the Supervisor or as determined by the client prior to award of the contract. Samples of the installation materials shall be tested by the drilling Contractor. During installation, the supervisor will confirm that the screen open surface area is as specified in the contract with a uniform slot size. In addition, the Supervisor will ensure that the casings and screens are centralized in the borehole so as to leave a uniform annular space between the borehole wall and the casing. Suitable centralizers should be provided to allow the casing and screen to be set correctly in the centre of the drilled borehole.
- In case the design was predetermined before the actual drilling, reconstruction of the well-design after the drilling, or possible encountering unproductive well (dry) due to unforeseen variations in hydrogeological conditions, the contractor shall be required to make consultations with the site supervisor who, upon a sound technical judgment, for which he/she takes full responsibility, will consult with the employer/client, then issue written approval and instructions to the contractor to go ahead with the necessary changes. All the changes made shall be properly recorded and shall form part of the driller's log.

5.1.6 Temporary Casings

The supervisor shall direct installation and recommend the diameter of any temporary casing required for the construction of the borehole based on formation penetrated. He shall ensure that the same are retrieved at the end of all drilling and installation activities. Where the contractor is unable to retrieve the casings due to jamming, this shall be confirmed that it has no negative effect to the quality of the water or the installation of the permanent designed borehole, and at no cost to the client.

5.1.7 Verticality

The Supervisor shall decide whether the Drilling Contractor will conduct a verticality test during and after drilling by approved methods to demonstrate that the departure from the vertical does not exceed 3 in 100 between ground level and the base of the borehole. If this departure is exceeded, the Contractor shall make the necessary corrections to the approval of the Supervisor. If the error cannot be corrected, then drilling shall cease and a new borehole be drilled at a position nearby, indicated by the Supervisor. The abandoned borehole shall be backfilled and/or capped by methods approved by the Supervisor.

5.1.8 Gravel pack

- The Supervisor shall ensure that suitable gravel pack is supplied by the Contractor. Prior to delivery, samples of the gravel pack shall be analysed for grain size and approved by the Supervisor. Gravel should consist of washed, well-rounded particles of a uniform grading. The gravel shall contain 90% siliceous material and contain no clay, shales, silt, fines, excessive amounts of calcareous materials or crushed rock.
- In terms of grain size, 90% shall conform to the grading specified and the Contractor shall be required to submit samples of the material prior to installation for approval by the Supervisor. Sufficient gravel pack shall be installed to cover completely the uppermost screen, plus an additional 5 m length (to allow for settling). A good supply of water should be introduced with the gravel to prevent bridging. The pack should be capped with a clay

seal to prevent contamination. The annular space above this seal can be back filled with inert drill cuttings. The top three meters should be grouted with cement.

5.1.9 Sanitary Seal

To provide an effective seal to the entry of contaminants, the upper 10 meters of the borehole will be grouted using a cement slurry injected into the annulus between the casing and the wall of the hole, by a method to be approved by the Supervisor. Grouting ensures non entry of contaminants to the well.

5.1.10 Water quality and electrical conductivity measurements

Carries out water quality analysis in conformity with specifications. Electrical conductivity (EC) readings shall be carried out whenever required during drilling, development and test pumping. EC measurements and readings shall be taken for each aquifer strike.

5.1.11 Development and cleaning of borehole

- Development and cleaning of the borehole shall be carried out by the Contractor upon completion of the drilling and installation of casing and screens. This will remove the native silts, clays and drilling fluid residues deposited on the borehole wall and adjacent portions of the aquifer during the drilling process.
- If organic drilling fluids are used, they shall be broken down chemically according to manufacturer's recommendations before or during development. Cleaning shall be carried out by airlift pumping, surging, backwashing or jetting. Clay disaggregation by means of Sodium Hexametaphosphate ('Calgon') treatment might be necessary in some cases. The Supervisor issue instructions to the contractor for such treatment.
- The method proposed by the Contractor for development of borehole shall be submitted to the Supervisor in writing for his approval. Development of borehole shall be effective from the depth at which water is encountered to the bottom of the borehole. Development shall continue until water is completely free from fine particles, as to be decided by the Supervisor. Upon completion of development, any accumulation of material shall be removed from the bottom of the borehole by airlifting.
- The supervisor shall ensure that all native silts, clays and drilling fluid residues deposited on the borehole wall and adjacent portions of the aquifer during the drilling process are removed. Cleaning shall be procedural starting within the regions of first water strikes systematically and bottom wise. **The supervisor must ensure that the pressure used for during development does not exceed the threshold of the uPVC casings not to damage them. A jetting tool may be used to reduce the pressure. The shifting from airlifting to surging should be step-wise by reducing the compressor's output slowly until the compressor is completely turned off, but not an instant turn off.**

5.1.12 Well Disinfection

The supervisor will ensure that disinfection of the borehole is carried out by the Contractor before demobilization from the site. This shall be done by placing a chlorine solution into the well so that a concentration of at least 50 mg/l of available chlorine existing in all parts of the borehole at static conditions. All the borehole surfaces above the static water level shall be completely flushed with the solution. The solution shall remain in the borehole a minimum of 2 hours before pumping the borehole to waste.

5.1.13 Test pumping

- The supervisor shall ensure that the Contractor performs test pumping to establish well performance and yield of the borehole. Test pumping unit shall be provided for the testing

of the drilled borehole. Standard test pumping will be for periods of 72 hours, which might be extended at the discretion of the Supervisor if the water level has not stabilized after the 72 hours. The method for varying the discharge rate of the pumps will depend on the type of pumps used. The Contractor shall provide a suitable means of achieving the rate of flows specified and seek approval by the Supervisor.

- Before testing, the borehole will be subject to a short-term testing (calibration) to establish the approximate yield/drawdown characteristics and to decide upon pumping rates for step-drawdown or continuous yield tests. Sufficient time shall be allowed for the recovery of water levels in the borehole between each type of test. This shall be at the discretion of the Supervisor.
- Discharge measurements shall be made by volumetric method or otherwise approved calibrated measuring device. During the test pumping, the discharge water must be handled and disposed off in an appropriate manner to a point of overland drainage sufficiently far from the well to prevent recharge. The water shall be diverted over a distance of at least 100m from the wellhead.
- During all testing operations, once the flow rate has been determined and preliminary adjustments made, the measured discharge rate shall be maintained within 5% of the required rate for the duration of the test. Persistent fluctuations beyond this tolerance will require abortion of the test and repetition at contractor's own cost.
- When continuous pumping at a uniform rate is specified, failure of the pump operation for a period greater than one percent of the elapsed pumping time shall also require the test to be stopped and repeated at the contractor's own cost.
- Any test which is aborted due to the reasons above, shall be repeated after recovery of the water level.

5.1.14 Water level observations

Water level observations shall be made to the nearest 10 mm at pre-determined intervals. The water levels should be measured during calibration test, test pumping and recovery.

5.1.15 Water Sampling

Water samples will be taken at the end of the test pumping for testing the chemical and bacteriological water quality. The samples should be taken to a competent laboratory for analysis.

5.1.16 Capping of the Borehole

Design of the borehole cap and headworks shall be made by the Supervisor in such a way as to prevent entrance of foreign matter into the borehole. Any objectionable materials that may fall into the borehole shall be removed in a method as directed by the Supervisor.

5.1.17 Clearing the Site

Ensuring that the site is left in a clean and tidy condition on completion of the work, and the contractor acts in a responsible manner with respect to any environmental or pollution control guidelines or regulations. On completion of each borehole the site must be left clean and free from all debris, hydrocarbons and waste, and all pits filled to the satisfaction of the supervisor.

5.1.18 Health and Safety

The supervisor shall ensure that health and safety and other environmental guidelines are adhered to on the sites.

5.1.19 Standby time

In the event of delays occurring as a result of action or inaction by the Client, for which the Contractor would be entitled to claim Standby Time, the Contractor should notify and seek approval of the Supervisor immediately in writing. The same will be communicated to the client.

5.1.20 Data analysis and preliminary reporting

Daily drilling progress reports shall be made available to the Client. In addition, a borehole completion report shall be compiled at the end of the drilling and installation. Included in this report shall be all drilling data, design and installation details, test pumping data, graphs and analysis. The drilling site supervisor shall be responsible for the correct interpretation of the test-pumping data for each borehole. Soft copies of the data analysis shall be submitted to the Employer as part of the relevant reports.

5.1.21 Records

- The Supervisor, during his execution of the contract, shall prepare site records, completion records carefully and accurately for each borehole, and submit promptly to the employer; fortnightly, weekly, monthly reports. Submission shall be made not later than 7 days after the end of the reporting period. The reports shall focus on progress, general performance, finances, issues, lessons learnt and recommendations. Completion records shall be duly signed by the Contractor and site supervisor.
- Daily activity records shall be kept by the Supervisor for each borehole and must be included in the final borehole completion report. The records, classified as daily and completion records, shall contain the information as specified below.

5.1.22 Daily Record

- The following report must be kept and submitted by the borehole supervisor:
 - a) Site name, Location, and GPS Coordinates
 - b) Reference number of boreholes
 - c) Dates and Time of reporting-Starting and Completion of the Drilling, Development and Pump Test
 - d) Names of foreman and drillers
 - e) Method of drilling
 - f) Diameter of hole, and depth of changes in diameter
 - g) Depth of hole at start and end of shift or working day
 - h) Depth and size of casing at start and end of shift
 - i) Description of rocks drilled with depths of transitions encountered
 - j) Depth at which water is struck
 - k) Yield of air lifted water, when drilling or developing with air, and Final Pumping Test yield and Dynamic Water Level.
 - l) Time log showing rate of penetration in minutes per metre, type of bit, standby time due to breakdown
 - m) Depth intervals at which each formation samples are taken
 - n) Records of components and quantities used or added to the drilling fluid or air
 - o) Water level at the start of each working day
 - p) Electrical conductivity measurements during drilling and at the end of the pump test
 - q) Problems encountered during drilling
 - r) Details on installation in the borehole (if any).
 - s) Depth and description of well casing
 - t) Depth and description of well screens
 - u) Depth of Gravel Pack, Backfill and Grouts
 - v) Details of work to be invoiced at hourly rates (eg. Test pumping)

- w) Pump power, type and depth. (To be recommended by the drilling supervisor)

5.1.23 Borehole Completion Record

- The following completion record must be submitted by the borehole supervisor:
 - a) As per standard borehole completion form.
 - b) Detailed driller's log.
 - c) Copy of standard chemical water quality test
 - d) Borehole design and installation details (as-built drawing)
 - e) Particulars of contractor and applicant (herein client)
 - f) Aquifers and formation of aquifer penetrated
 - g) Summary of test pumping data
 - h) Remarks
- A copy of the Borehole Completion Record by contractor shall be made available to and approved by the supervisor on completion of the borehole.

5.2 Final Borehole Completion Report

- On completion of all the works, a final report will be prepared with details of all the technical data including but not limited to:
 - a) All drawings and sketches (borehole design)
 - b) Installation,
 - c) Well development,
 - d) Test pumping and pump test data analysis, and recovery data analysis
 - e) Conclusion and recommendations on optimal abstractable yields
- In addition, all pertinent data from all the works executed will be provided by the Supervisor. Data on water quality will be similarly evaluated after submission by the contractor, of water samples to competent laboratories for chemical and bacteriological analysis.
- Based on this analysis recommendations will be made by the consultant on the most optimal groundwater abstraction rates and aquifer parameters and performance. It will also recommend any remedial measures for disinfection or water quality improvement.

5.3 Certification of contractor’s invoices

All invoices from the Contractor shall be certified by the consultant for payment. The site supervisor shall verify the contractor’s certificates of payments and the supporting documents for work completed prior to payment of the Contractor by the client.

5.4 Recommendation of production pump

Based on analysis of drilling results and test pumping of the borehole, the supervisor shall recommend the optimal production pump and appropriate pumping regime for the wellfield.

6 Deliverables

Upon completion of drilling and testing etc. studies the Supervisor will prepare editable electronic copies (in word, excel, AutoCAD, EPANET, WaterCAD) to the SDF Secretariat and HWA Project Managers. PDF alone is not allowed. Deliverables from the assignment are as indicated in the table below:

Report	Content
Supervisor’s Daily Record with specific details	Summary of week’s activities and any problems encountered should be submitted to the PMT on the last working day of the week.

Site Records and Borehole logbook.	A complete soil borehole logbook classification and characteristics for the borehole for each layer of the borehole shall be submitted to the Client with copies to MoWRD after completion. No certificate of payment to the Contractor shall be honoured until all such records are duly compiled and submitted to the Employer.
Monthly Report	This is to be submitted in two copies within the first week of the subsequent Calendar month. This will be submitted to the client. This report will present a detailed account of the month's activities, including data interpretations, water source construction progress and any difficulties encountered. The report should be accompanied by any relevant maps, plots and data and also include a clear indication of actual project progress vis-à-vis anticipated progress, plus details of staff and equipment deployment. The report should also outline forthcoming activities for the next month.
Final Report	This will constitute detailed account of all the activities carried out during the drilling of the 4-8 boreholes, including data interpretations, water source construction progress and the problems encountered. All relevant documents including maps, sketch maps of the sites and any other relevant document supporting the work done. Should have detailed conclusions and recommendations. The outline table of contents of the final report will be as follows: <ul style="list-style-type: none"> • Executive Summary • Introduction, review of expected performance • Account according to the bullet points under scope of work, above. Include check lists, and Well Completion Form, Handing over forms, etc. • Well construction and installation works (include as built drawings) • As built BoQ • Water quality from contractor's lab or any competent lab • Drilling data and penetration rates • Well development • Test pumping and results interpretations • Daily completion records as annex • Particulars of the client and consultancy • Conclusions. • Recommendations

7 Supervision/relations

The Borehole Drilling Supervisor will work under the supervision of the HWA Project Manager and SDF Senior Water Expert. The holder of the position will also work closely with relevant HWA Planning designated staff.

8 Performance evaluation and contract extensions

Key performance targets will be agreed with the supervisors and signed off prior to the commencement of the assignment. If the Borehole Supervisor is not able to meet the expected performance targets, these will be addressed in line with the terms and conditions of service of the PMT staff.

9 Timing and duration

The supervisor is expected to perform his/her tasks in Lasdhure, Northern Hargeisa. The assignment will be expected to for up to 6 months from the date of signing of the Contract. A working week for this assignment will run from Sunday to Thursday (5 days).

10 Required qualifications, skills and experience

The drilling site supervisor should have with the following qualifications:

Qualifications and skills

- Minimum of High Diploma or Equivalent in Drilling or Water Supply or related technical field (like Geology).
- Hands-on contract and day-to-day management of drilling contractors
- Demonstrated practical experience in the deep groundwater development from siting up to drilling;
- Demonstrated excellent command of spoken and written English. Fluency in Somali is requested; and
- Excellent interpersonal and diplomatic skills.

General professional experience

- At least 10 years demonstrated experience in the field of drilling deep boreholes and able to provide evidence and contact references

Specific professional experience

- Minimum of 5 years conducting borehole drilling supervision in Somaliland. The supervisor must demonstrate that they have conducted at least three similar assignments in the last 3 years.

11 Payment

- A monthly salary will be paid to the selected Borehole Drilling Supervisor upon submission of time sheets and invoice approved by the HWA Project Manager and Endorsed by the SDF Secretariat Senior Water Expert; and
- Any other allowance will be in line with the Project Management Teams terms and conditions of service.

12 How to apply

Interested candidates should send their application (cover letter and CV) to the Somaliland Development Fund Secretariat through e-mail jobs@sdf-secretariat.org. Candidates should indicate in their cover letter how they fit the criteria outlined in the advert. All applications must be received by **10 July 2020 at 1600hrs East African Standard Time**. Applicants should clearly indicate the position they are applying for in the email subject line. The position JD can be accessed on the SDF website through the link <https://www.somalilanddevelopmentfund.org/opportunities-open>

Any attempt by a candidate to influence the outcome of the recruitment process in any way which can be interpreted as canvassing will lead to automatic disqualification from being considered for this position.

This role is open to Somaliland nationals only.
Women candidates are strongly encouraged to apply.