



AGRICULTURAL RESEARCH COUNCIL  
NATURAL RESOURCES AND ENGINEERING  
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CLIENT REPORT

**SPECIFICATIONS OF DRILLING A  
BOREHOLE AT NDABAKAZI**

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May 2024

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AE Project No:  
Pilot report

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## 1 Background

ARC VIMP requested ARC NRE to write a specification to drill a borehole at the NDABAKAZI site which is in the Eastern Cape near East London

### 1.1 Site information

- GPS coordinates: -32.388407° 27.957218°
- Short field grass covering
- ± 5.2 km to tar road (N2) from plot
- ± 500m Communal farm road to gravel road

### 1.2 Photo of site 3



### 1.3 [Google Earth photo of surrounding areas](#)



## 2 [Scope of the Work](#)

The works included in the contract consist of two stages:-

### **STAGE 1:**

This stage is comprised of the following activities:

#### 2.1.1 [Hydrological site survey](#)

Borehole contractor will be required to conduct a hydrological site survey using an established hydrologist to establish the best point to drill a borehole within the area. A detailed report is to be submitted to the Project Manager. The report should clearly indicate if it is viable to drill a borehole.

#### 2.1.2 [Formal Submittal to governing agencies](#) [\(permitting and licensing\)](#)

Borehole Contractor will have to make applications and acquire permits for drilling a bore hole from relevant authorities. This includes WULA licenses and all other necessary documents as per the local authority requirements at the time of application.

### **STAGE 2:**

This stage is comprised of the following activities:

#### 2.2.1 [Drilling of the borehole:](#)

- The drilling of one borehole of sufficient diameter to provide for a finished cased and screened borehole of 200mm diameter to the provisional depth of about 100 metres.

- The provision and installation of plain high density synthetic, slotted synthetic casings, and gravel pack, borehole cap (Galvanised Steel borehole baseplate 32mm), together with cementation works necessary.
- The collection of formation samples at 2 meter interval of drilling progress to the bottom, also water sample at every aquifer struck and at the beginning and at the end of test pumping operation for both chemical and biological analysis.

**NOTE:** - These depths and any other works can be varied by the Project Manager depending on the actual conditions encountered in the process of executing of the works.

### 3 Local Conditions

The borehole will be drilled, constructed and test pump in both unconsolidated and consolidated formation and the Borehole Contractor must be prepared to carry out the required work through any type of formation in the project area.

### 4 Tests and sampling

After the borehole has been completed, constructed and developed, the Borehole Contractor shall make necessary arrangements for conducting a **24 hour continuous test pumping** up to a maximum of 30hr and a **12 hour recovery test** under the supervision of the Project Manager. Where the Services Engineer or his representative cannot be present on such pumping test, the Borehole Contractor may continue without him keeping accurate records of the test in terms of discharge and drawn down but must seek permission from the Project Manager. Should the Borehole Contractor fail to keep such records, the Project Manager shall order the test to be repeated at no extra cost.

### 5 Records and reporting

The Contractor shall keep daily activity records for each borehole. The records shall contain the information as specified below. In addition, separate records should be supplied for the borehole upon completion,

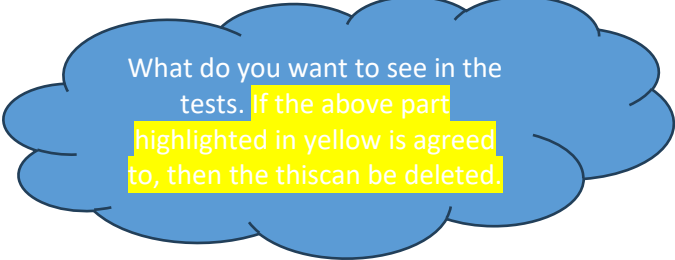
1. Daily Record – of what? Is it same as item 9 & 10?
2. Site name and reference number of borehole
3. GPS Co-ordinates of borehole (latitude and longitude)
4. Names of foreman and drillers
5. Method of drilling
6. Make, model, type and size of the drilling rig
7. Diameter of hole, and depth of changes in diameter
8. Depth of hole at start and end of shift or working day
9. Depth and size of casing at start and end of shift or working day
10. Description of strata drilled with depth of transitions encountered
11. Depth at which water is struck
12. Yield of air lifted water, when drilling or developing with air, in litres per second.
13. Time log showing rates of penetration in minutes per metre, type of bit and standby time due to breakdown.

14. Depth intervals at which formation samples are taken
15. Records of components and quantities used or added to the drilling fluid or air
16. Water level at the start of each working day
17. Electrical conductivity measurements during test pumping
18. Problems encountered during drilling
19. Depth, size and description of well casing depth, size and description of well screens
20. Aquifer depth and SWL after completion of the well
21. A copy of the Daily Record shall be made available daily to the ARC, and should include any other pertinent data as may be requested by the ARC.

### 5.1 Water tests

**Water samples shall be collected and tests for both chemical and bacteriological analysis and submitted in a competent laboratory for analysis.**

The test results should indicate the suitability of the water for irrigation, household/drinking and the bacterial load with full identification of the bacteria.



What do you want to see in the tests. If the above part highlighted in yellow is agreed to, then the this can be deleted.

## 6 Cessation of Work The Project Manager reserves the rights to stop drilling operations if in his opinion:-

- A sufficient supply of water has been obtained.
- The work is not being carried out in a satisfactory manner or
- Further drilling is unlikely to be advantageous or for any other reason
- In this event, payment shall be made only for the amount of work done up to the date of stoppage.

## 7 Borehole lock

- The borehole must be locked with a anti-theft borehole clamp mechanism that prevent theft and vandalism of the borehole . The mechanism must be presented to the project manager before purchasing.

## 8 Drilling site cleanup

- Each drilling site should be completely cleared of all waste after use. Drilling waste (chippings and mud) should be buried. Rubbish, waste oil, and chemicals should be disposed-off according to industry standards and a report to that effect should be provided. No spillage of oils or fuels should occur. 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 ARC project manager.