



Southern Sudan Drilling Services Ltd

Private Sector Perspective on Cost Effective Boreholes – South Sudan

International Workshop on Cost-Effective Boreholes (CEB)
in Sudan

Khartoum, Sudan

Present by

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Presentation

- **What is Southern Sudan Drilling Services Ltd**
- **What is a cost effective borehole**
- **Experience and methods of drilling cost effective borehole – South Sudan**
- **Challenges of delivering cost effective boreholes in South Sudan**

What is Southern Sudan Drilling Services Ltd

- Southern Sudan Drilling Services Ltd is a young indigenous local drilling company from Southern Sudan, registered in 2007
- The local company operating in south Sudan and currently in Northern Bahr El Ghazal State one of the ten state of southern Sudan
- Using a drilling rig loaned by UNICEF as part of local drilling capacity building
- The company has drilled 32 boreholes in Northern Bahr el Ghazal state

What is Cost effective borehole

- A cost effective borehole may be understood or defined as a borehole that is **delivered to a community at lowest cost**, of good quality technical construction (drilling, casing, screening, grouting, well development, test pumping, platform construction & Installation), of good yield, and able to function and serve **the** beneficiary community for long **time at** minimum maintenance cost.



Experience and methods for cost effective borehole-South Sudan

Drilling Methods

- The drilling method we have in South Sudan is described as follows:
 - Air drill
 - mud flash,
- And these methods are used in different formations and holes.
- The boreholes are designed and constructed in many ways, there is Granite hole, Regolith hole, and sedimentary hole.
- Granite is designed in three ways according to the formation you encounter underground

Experience and methods for cost effective borehole-South Sudan

The Granite Hole

- 100 mm nominal diameter unlined, drilled using drag bit 6” with air, foam or mud flash, penetrating the top soil, sand, silts and clay typically ,soft weathered rock , granite up to depth of 80m.
- PVC casing installation done up to 20m on soft weathered rock and grouted at that depth, apron construction and pump installation after
- This formation is found in West, central Equatoria and Aweil NBeG in southern Sudan



Experience and methods for cost effective borehole-South Sudan

The Granite Hole

- Lined with 4" Pvc casing and screen, Drilled 8" drag bit Air, foam or mud flush, install steel or pvc temporary casing use DTH Hammer button bit 5" drill to the depth of 60-70, install 4" casing plain and screen to 70m put grouted gravel pack and remove temporary casing before development. This bore hole is in Aweil center county



Experience and methods for cost effective borehole-South Sudan

The Regolith hole

- Taking water from weathered layer above hard rock, drilled 8" drag with mud flush, penetrate the sand, silts and clay typically, go through permeable-storing water on hard rock at the depth of 40-50m, this in NBeG WBeG and Lake state



Experience and methods for cost effective borehole-South Sudan

The Sedimentary hole

- Naturally developed, drill using 8” drag bit with mud flush up to the depth 70-80 in fine sand formation, this is NBeG, Unity and upper Nile States
- Naturally developed, drill using 6 ½” drag bit with mud flush up to the depth 100-150 it is in sand clay formation, this is NBeG, Unity and upper Nile States.

Experience and methods for cost effective borehole-South Sudan



Challenges of delivering cost effective boreholes in South Sudan

- Accessible is difficult during the rainy season and thus expensive to drill during rain season due to time encountered during mobilization from one site to another
- Penetration through granite demands button bits which are expensive and not easy accessed (PAT)
- Mobilizing water for mud drilling in dry season in NBEG ranges from 30 to 60 killo meters
- Getting spare parts takes three to six month when order from Bangkok for PAT drilling rigs.
- Getting local experienced trained drilling crew/peronal is sometimes difficult

Challenges of delivering cost effective boreholes in South Sudan

- Obtaining some materials like gravel packing materials is in most cases brought from far thus increasing the cost of delivering a borehole.
- Major repair, servicing and maintenance of equipment in South Sudan is most times very expensive as experienced technicians from to come from Khartoum or East Africa.
- Geophysical equipment for hydrogeological surveys is very expensive and local companies may not afford, thus putting the cost for dry boreholes on the unit cost for delivering a borehole to cover up



Thank You