**Technical Data, BOQ, and Specification of proposed Solar Hybride upgrade at ND Zamzam Camp Shakir borehole**

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| **Parameters** | | **Site 1** |
| State | | North Darfur |
| Locality | | Al Fasher |
| Village/Camp | | Zamzam Camp |
| Type of water source | | Borehole |
| Borehole Site name | | Shakir Borehole |
| GPS Location | Lat, (DD) | 13.495853 |
| Long, (DD) | 25.287163 |
| Altitude (m) | 717 |
| Water Temperature | | 40°C |
| Borehole Maximum Yield (m3/h) | | 7 m3/h |
| Daily Water Demand to be supplied with Solar (m3/day) | | 60 m3/day |
| Estimated Maximum Cable Length from pump to inverter (m) | | 100m |
| Dirt allowance factor | | 10% |
| Surface available for panel mounting (m2) | | 200 |
| Length of pipe from borehole head to water tank inlet (m) | | 15m |
| Size and type of delivery pipe to tank | | 32mm (1.25”) GI |
| Pump intake depth (m) | | 60m |
| Size and type of drop pipe (inside the borehole) | | 32mm (1.25”) GI |
| Depth of well/borehole (m) | | 65m |
| Static Water level (m) | | 43 |
| Dynamic Water Level (m) | | 50 |
| Vertical Height from borehole head to water tank inlet (m) | | 3m |
| Total Dynamic Pressure Head estimated(m) | | 76m |
| Internal Borehole diameter (inches) | | 5.5’’ (138mm) |
| Capacity of water tank (m3) | | 31m3 |

**BOQ for Hybrid –solar system for site 1- North Darfur in Zamzam Camp- Shakir BH**

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| **ITEM** | **ITEM DESCRIPTION** | **QTY** | **UNIT** | **RATE** | **AMOUNT** |
| 1. | Supply and installation of PV Solar panels-module. Mono-Si – 250W(should meet IEC/EN61215&61730 standards- Vendor to submit detail specification and certification proof)[[1]](#footnote-1) | **23** | **pcs** |  |  |
| 2. | Supply and installation of Switch box/control box/Inverter On/Off. It should also include maximum power point tracking (MPPT), dry running, voltage and overload protection. Equipment brand should be know and acceptable with high preference of Grundfos brand. | **1** | **set** |  |  |
| 3. | Supply and installation of metallic enclosure for the Switch box and accessories. | **1** | **Set** |  |  |
| 4. | Supply and installation of Support structure-anti corrosion, bolted type for all modules needed with high stand the support fixed two lines as per Engineers instruction. | **1** | **set** |  |  |
| 5. | Supply and installation of Earth wire/rode hole | **1** | **pcs** |  |  |
| 6. | Supply and installation of the Pump drop cable, 4x6mm2 as per standard specification and Engineers instruction. | **1** | **roll** |  |  |
| 7. | Supply and installation of Sensor cable 1.5mm as per standard specification and Engineers instruction. | **1** | **roll** |  |  |
| 8. | Supply and installation of the Pump security wire, 6mm2 as per standard specification and Engineers instruction. | **1** | **roll** |  |  |
| 9. | Supply and installation of the Cable 2.5mm as per standard specification and Engineers instruction. | **1** | **roll** |  |  |
| 10. | Supply and installation of appropriate Fittings(Connecter, adapters, elbows, clamp) as per Engineers instruction. | **1** | **Set** |  |  |
| 11. | Supply and installation of the Water flow meter 32mm (1.25")on the pipe system from BH to Elevated tank inlet as per Engineers instruction. | **1** | **pcs** |  |  |
| 12. | Supply and installation of Timber box for protecting the box | **1** | **pcs** |  |  |
| 13. | Supply and installation of appropriate Change over switch /Power pack AC-DC needed for operating the Generator set | **1** | **pcs** |  |  |
| 14. | Supply and installation of the Lightening protection/Surge arrester with copper strip | **1** | **pcs** |  |  |
| 15. | Supply and installation of a protection 3m high fence for solar system 20x10m(with razor all wire at the top) as per Engineers instruction. | **1** | **Pcs** |  |  |
| 16. | Supply and installation of appropriate Isolation valve (32mm/1.25’’ Check valve) as per Engineers instruction. | **1** | **Pcs** |  |  |
| 17. | System testing and on the Job training for RI staff and WUC members | **1** | **Pcs** |  |  |

1. Vendor could submit Panels bigger or smaller than 250W but the number of panels needed should be adjusted proportionally. [↑](#footnote-ref-1)