**Technical Data, BOQ and Specification of proposed Solar Hybride upgrade at ND and BLNS**

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| **Parameters** |  **Site 1** | **Site 2** |
| State  | North Darfur  | Blue nile state  |
| Locality  | Al Fasher  | Ed Damazine  |
| Village/Camp  | Zamzam Camp | Shinteshrab  |
| Type of water source  | Borehole  | Borehole  |
| Borehole Site name  | BH. No. 15 | Shinteshrab  |
| GPS Location | Lat, (DD) | 13.48628 | 11.93752 |
| Long, (DD)  | 25.30704 | 34.29555 |
| Altitude (m) | 717 | 467 |
| Water Temperature  | 35°C | 30°C |
| Borehole Maximum Yield (m3/h) |  4.3 m3/h | 30 m3/h |
| Daily Water Demand to be supplied with Solar (m3/day) | 40 m3/day | 300 m3/day |
| Estimated Maximum Cable Length from pump to inverter (m) | 100m | 70m |
| Dirt allowance factor | 10% | 10% |
| Surface available for panel mounting (m2) | Xxxxx(available surface is not much but water committee agreed to dismantle fencing to increase surface area) | 200m |
| Length of pipe from borehole head to water tank inlet (m) | 100m | 300m |
| Size and type of delivery pipe to tank |  50mm (2”) GI | 75mm (3”) GI |
| Pump intake depth (m) | 63m | 45m |
| Size and type of drop pipe (inside the borehole) |  38mm (1.5”) GI | 75mm (3”) GI |
| Depth of well/borehole (m) | 68m | 45m |
| Static Water level (m) | Xxxx | 27.5m |
| Dynamic Water Level (m) | xxxx | 29m |
| Vertical Height from borehole head to water tank inlet (m) | 12m | 16m(estimated) |
| Total Dynamic Pressure Head estimated(m)  | 80m(with 100m length 2’’ and 63m 1.5’’ GI, Q=1.2lit/sec) | 70m(with 333m length 3’’ GI, Q=8.33lit/sec) |
| Internal Borehole diameter (inches) | 6.5’’ (160mm) | 8’’(200mm) |
| Capacity of water tank (m3) | 18m3  | 45m3 |

**BOQ for Hybrid –solar system for site 1- North Darfur in Zamzam Camp- BH no. 15**

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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)[[1]](#footnote-1)  | **14** | **pcs** |  |  |
| 2. | Supply and installation of Switch box/control box/Inverter On/Off with metallic enclosure. It should also include maximum power point tracking (MPPT), dry running, voltage and overload protection[[2]](#footnote-2). Equipment brand should be know and acceptable with high preference of Grundfos brand.  | **1** |  **set** |  |  |
| 3. | 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** |  |  |
| 4. | Supply and installation of Earth wire/rode hole  | **1** | **pcs** |  |  |
| 5. | Supply and installation of the required length cable and security wire kits, includes Pump drop cable, 4x6mm2 , Sensor cable 1.5mm and pump security wire6mm2 as per standard spec and Engineers instruction  | **1** | **Set** |  |  |
| 6. | Supply and installation of the Cable 2.5mm roll of 90m | **1** | **roll** |  |  |
| 7. | Supply and installation of required appropriate Fittings(Connecter, adapters, elbows, clamp) as per Engineers instruction  | **1** | **Set** |  |  |
| 8. | Supply and installation of the Water flow meter 50mm (2")on the pipe system from BH to Elevated tank inlet as per Engineers instruction  | **1** | **pcs** |  |  |
| 9. | Supply and installation of Timber box for protecting the box  | **1** | **pcs** |  |  |
| 10. |  Supply and installation of appropriate Change over switch /Power pack AC-DC needed for operating the Generator set  | **1** | **pcs** |  |  |
| 11. |  Supply and installation of the Lightening protection/Surge arrester with copper strip  | **1** | **pcs** |  |  |
| 12. |  Supply and installation of a protection 3m high fence for solar system 20x10m(with razor all wire at the top) | **1** | **Pcs** |  |  |
| 13. | Supply and installation of the required Isolation valve (50mm/2’’ Check valve) as per Engineers instruction  | **1** | **Pcs** |  |  |
| 14 | System testing and on the job training for WUC members  | **1** | **day** |  |  |

 **BOQ for Hybrid –solar system for site 2- Bluenile State -Shinteshrab Borehole**

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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)[[3]](#footnote-3)  | **48** | **pcs** |  |  |
| 2. | Supply and installation of Switch box/control box/Inverter On/Off with metallic enclosure. It should also include maximum power point tracking (MPPT), dry running, voltage and overload protection[[4]](#footnote-4). Equipment brand should be know and acceptable with high preference of Grundfos brand. | **1** |  **set** |  |  |
| 3. | 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** |  |  |
| 4. | Supply and installation of Earth wire/rode hole | **1** | **pcs** |  |  |
| 5. | Supply and installation of the required length cable and security wire kits, includes Pump drop cable, 4x6mm2 , Sensor cable 1.5mm and pump security wire6mm2 as per standard spec and Engineers instruction | **1** | **Set** |  |  |
| 6. | Supply and installation of Cable 2.5mm roll of 90m | **1** | **roll** |  |  |
| 7. | Supply and installation of required appropriate Fittings(Connecter, adapters, elbows, clamp) as per Engineers instruction | **1** | **Set** |  |  |
| 8. |  Supply and installation of the Water flow meter (75mm)3" on the pipe system from BH to Elevated tank inlet as per Engineers instruction  | **1** | **pcs** |  |  |
| 9. | Supply and installation of Timber box for protecting the box  | **1** | **pcs** |  |  |
| 10. |  Supply and installation of appropriate Change over switch /Power pack AC-DC needed for operating the Generator set | **1** | **pcs** |  |  |
| 11. | Supply and installation of the Lightening protection/Surge arrester with copper strip | **1** | **pcs** |  |  |
| 12. | Supply and installation of protection 3m high fence for solar system 15x10m(with razor all wire at the top) | **1** | **no** |  |  |
| 13. | Supply and installation of Isolation valve (75mm/3’’ Check valve) as per Engineers instruction  | **1** | **no** |  |  |
| 14. | System testing and on the Job training for WUC members  | **1** | **day** |  |  |

1. Vendor could submit Panels bigger or smaller than 250W but the number of panels needed should be adjusted proportionally. [↑](#footnote-ref-1)
2. Unit rate should include/consider all associated submersible pumps withdrawal, installation/re-installation of submersible pumps and Generators. [↑](#footnote-ref-2)
3. Vendor could submit Panels bigger or smaller than 250W but the number of panels needed should be adjusted proportionally. [↑](#footnote-ref-3)
4. Unit rate should include/consider all associated submersible pumps withdrawal, installation/re-installation of submersible pumps and Generators. [↑](#footnote-ref-4)