



**DEPARTMENT OF WATER AND SANITATION
REPUBLIC OF SOUTH AFRICA**

**W11357: SUPPLY AND DELIVERY OF EQUIPMENT, SENSORS, APPLICATION SOFTWARE,
VANDAL RESISTANT EQUIPMENT HOUSING AND ACCESSORIES FOR THE MEASUREMENT
AND TRANSMISSION OF SURFACE AND GROUNDWATER PARAMETERS FOR A PERIOD OF
THIRTY-SIX (36) MONTHS**

(ISSUED DATE)

14 MAY 2021

Due to the COVID 19 restrictions, there will be no briefing session..

(CLOSING DATE)

18 JUNE 2021

DUE AT 11:00

SUBMIT BID DOCUMENTS TO:

POSTAL ADDRESS: OR TO BE DEPOSITED IN:

**DIRECTOR-GENERAL: WATER AND SANITATION THE TENDER BOX AT THE ENTRANCE
PRIVATE BAG X313 OF ZWAMADAKA BUILDING
PRETORIA, 0001 157 FRANCIS BAARD STREET
(FORMERLY SCHOEMAN STREET)
PRETORIA, 0001**

BIDDER: (Company address and stamp)

COMPILED BY: BRANCH PLANNING AND INFORMATION MANAGEMENT

DEPARTMENT OF WATER AND SANITATION

BID NO: W11357

SUPPLY AND DELIVERY OF EQUIPMENT, SENSORS, APPLICATION SOFTWARE, VANDAL RESISTANT EQUIPMENT HOUSING AND ACCESSORIES FOR THE MEASUREMENT AND TRANSMISSION OF SURFACE AND GROUNDWATER PARAMETERS FOR A PERIOD OF THIRTY-SIX (36) MONTHS

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PART A INVITATION TO BID

| | | | | | | | |
|--|--|--|--|--|------------------------------|--|------|
| YOU ARE HEREBY INVITED TO BID FOR REQUIREMENTS OF THE (NAME OF DEPARTMENT/ PUBLIC ENTITY) | | | | | | | |
| BID NUMBER: W11357 | | CLOSING DATE: 18 JUNE 2021 | | | CLOSING TIME: 11H00AM | | |
| DESCRIPTION | | SUPPLY AND DELIVERY OF EQUIPMENT, SENSORS, APPLICATION SOFTWARE, VANDAL RESISTANT EQUIPMENT HOUSING AND ACCESSORIES FOR THE MEASUREMENT AND TRANSMISSION OF SURFACE AND GROUNDWATER PARAMETERS FOR A PERIOD OF THIRTY-SIX (36) MONTHS | | | | | |
| BID RESPONSE DOCUMENTS MAY BE DEPOSITED IN THE BID BOX SITUATED AT (STREET ADDRESS) | | | | | | | |
| TENDER BOX AT ZWAMADAKA BUILDING 157 FRANCIS BAARD STREET (FORMERLY SCHOEMAN STREET) | | | | | | | |
| PRETORIA, 0002 | | | | | | | |
| BIDDING PROCEDURE ENQUIRIES MAY BE DIRECTED TO | | | | TECHNICAL ENQUIRIES MAY BE DIRECTED TO: | | | |
| CONTACT PERSON | | Mr Conory Mgwena | | CONTACT PERSON | | Mr Chris Lloyd | |
| TELEPHONE NUMBER | | 012 336 8578 | | TELEPHONE NUMBER | | 051 405 9248 | |
| FACSIMILE NUMBER | | N/A | | FACSIMILE NUMBER | | N/A | |
| E-MAIL ADDRESS | | MgwenaC@dws.gov.za | | E-MAIL ADDRESS | | lloyd@c@dws.gov.za | |
| SUPPLIER INFORMATION | | | | | | | |
| NAME OF BIDDER | | | | | | | |
| POSTAL ADDRESS | | | | | | | |
| STREET ADDRESS | | | | | | | |
| TELEPHONE NUMBER | | CODE | | | NUMBER | | |
| CELLPHONE NUMBER | | | | | | | |
| FACSIMILE NUMBER | | CODE | | | NUMBER | | |
| E-MAIL ADDRESS | | | | | | | |
| VAT REGISTRATION NUMBER | | | | | | | |
| SUPPLIER COMPLIANCE STATUS | | TAX COMPLIANCE SYSTEM PIN: | | | OR | CENTRAL SUPPLIER DATABASE No: | MAAA |
| B-BBEE STATUS LEVEL VERIFICATION CERTIFICATE | | TICK APPLICABLE BOX] | | B-BBEE STATUS LEVEL SWORN AFFIDAVIT | | [TICK APPLICABLE BOX] | |
| | | <input type="checkbox"/> Yes <input type="checkbox"/> No | | | | <input type="checkbox"/> Yes <input type="checkbox"/> No | |
| [A B-BBEE STATUS LEVEL VERIFICATION CERTIFICATE/ SWORN AFFIDAVIT (FOR EMES & QSEs) MUST BE SUBMITTED IN ORDER TO QUALIFY FOR PREFERENCE POINTS FOR B-BBEE] | | | | | | | |
| ARE YOU THE ACCREDITED REPRESENTATIVE IN SOUTH AFRICA FOR THE GOODS /SERVICES /WORKS OFFERED? | | <input type="checkbox"/> Yes <input type="checkbox"/> No [IF YES ENCLOSE PROOF] | | ARE YOU A FOREIGN BASED SUPPLIER FOR THE GOODS /SERVICES /WORKS OFFERED? | | <input type="checkbox"/> Yes <input type="checkbox"/> No [IF YES, ANSWER PART B:3] | |
| QUESTIONNAIRE TO BIDDING FOREIGN SUPPLIERS | | | | | | | |
| IS THE ENTITY A RESIDENT OF THE REPUBLIC OF SOUTH AFRICA (RSA)? | | | | | | <input type="checkbox"/> YES <input type="checkbox"/> NO | |
| DOES THE ENTITY HAVE A BRANCH IN THE RSA? | | | | | | <input type="checkbox"/> YES <input type="checkbox"/> NO | |
| DOES THE ENTITY HAVE A PERMANENT ESTABLISHMENT IN THE RSA? | | | | | | <input type="checkbox"/> YES <input type="checkbox"/> NO | |
| DOES THE ENTITY HAVE ANY SOURCE OF INCOME IN THE RSA? | | | | | | <input type="checkbox"/> YES <input type="checkbox"/> NO | |
| IS THE ENTITY LIABLE IN THE RSA FOR ANY FORM OF TAXATION? | | | | | | <input type="checkbox"/> YES <input type="checkbox"/> NO | |
| IF THE ANSWER IS "NO" TO ALL OF THE ABOVE, THEN IT IS NOT A REQUIREMENT TO REGISTER FOR A TAX COMPLIANCE STATUS SYSTEM PIN CODE FROM THE SOUTH AFRICAN REVENUE SERVICE (SARS) AND IF NOT REGISTER AS PER 2.3 BELOW. | | | | | | | |

PART B TERMS AND CONDITIONS FOR BIDDING

1. BID SUBMISSION:

- 1.1. BIDS MUST BE DELIVERED BY THE STIPULATED TIME TO THE CORRECT ADDRESS. LATE BIDS WILL NOT BE ACCEPTED FOR CONSIDERATION.
- 1.2. **ALL BIDS MUST BE SUBMITTED ON THE OFFICIAL FORMS PROVIDED-(NOT TO BE RE-TYPED) OR IN THE MANNER PRESCRIBED IN THE BID DOCUMENT.**
- 1.3. THIS BID IS SUBJECT TO THE PREFERENTIAL PROCUREMENT POLICY FRAMEWORK ACT, 2000 AND THE PREFERENTIAL PROCUREMENT REGULATIONS, 2017, THE GENERAL CONDITIONS OF CONTRACT (GCC) AND, IF APPLICABLE, ANY OTHER SPECIAL CONDITIONS OF CONTRACT.
- 1.4. **THE SUCCESSFUL BIDDER WILL BE REQUIRED TO FILL IN AND SIGN A WRITTEN CONTRACT FORM (SBD7).**

2. TAX COMPLIANCE REQUIREMENTS

- 2.1 BIDDERS MUST ENSURE COMPLIANCE WITH THEIR TAX OBLIGATIONS.
- 2.2 BIDDERS ARE REQUIRED TO SUBMIT THEIR UNIQUE PERSONAL IDENTIFICATION NUMBER (PIN) ISSUED BY SARS TO ENABLE THE ORGAN OF STATE TO VERIFY THE TAXPAYER'S PROFILE AND TAX STATUS.
- 2.3 APPLICATION FOR TAX COMPLIANCE STATUS (TCS) PIN MAY BE MADE VIA E-FILING THROUGH THE SARS WEBSITE WWW.SARS.GOV.ZA.
- 2.4 BIDDERS MAY ALSO SUBMIT A PRINTED TCS CERTIFICATE TOGETHER WITH THE BID.
- 2.5 IN BIDS WHERE CONSORTIA / JOINT VENTURES / SUB-CONTRACTORS ARE INVOLVED, EACH PARTY MUST SUBMIT A SEPARATE TCS CERTIFICATE / PIN / CSD NUMBER.
- 2.6 WHERE NO TCS IS AVAILABLE BUT THE BIDDER IS REGISTERED ON THE CENTRAL SUPPLIER DATABASE (CSD), A CSD NUMBER MUST BE PROVIDED.
- 2.7 NO BIDS WILL BE CONSIDERED FROM PERSONS IN THE SERVICE OF THE STATE, COMPANIES WITH DIRECTORS WHO ARE PERSONS IN THE SERVICE OF THE STATE, OR CLOSE CORPORATIONS WITH MEMBERS PERSONS IN THE SERVICE OF THE STATE."

NB: FAILURE TO PROVIDE / OR COMPLY WITH ANY OF THE ABOVE PARTICULARS MAY RENDER THE BID INVALID.

SIGNATURE OF BIDDER:

.....

CAPACITY UNDER WHICH THIS BID IS SIGNED:

.....

(Proof of authority must be submitted e.g. company resolution)

DATE:

.....

DEPARTMENT OF WATER AND SANITATION

BID NO: W11357

SUPPLY AND DELIVERY OF EQUIPMENT, SENSORS, APPLICATION SOFTWARE, VANDAL RESISTANT EQUIPMENT HOUSING AND ACCESSORIES FOR THE MEASUREMENT AND TRANSMISSION OF SURFACE AND GROUNDWATER PARAMETERS FOR A PERIOD OF THIRTY-SIX (36) MONTHS

SECTION 1: LEGALITIES

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1. Instructions to Bidders
2. Tax Clearance Requirements (SBD 2)
3. Declaration of Interest (SBD 4)
4. Declaration of Bidders Past Supply Chain Management Practices (SBD 8)
5. Preference Points Claim in terms of the Preferential Procurement Regulation, 2011 (SBD 6.1)
6. Instructions to Bidders: Purchases (Annexure 7)
7. Certificate of Independent Bid Determination (SBD 9)

DEPARTMENT OF WATER AND SANITATION

BID NO: W11357

SUPPLY AND DELIVERY OF EQUIPMENT, SENSORS, APPLICATION SOFTWARE, VANDAL RESISTANT EQUIPMENT HOUSING AND ACCESSORIES FOR THE MEASUREMENT AND TRANSMISSION OF SURFACE AND GROUNDWATER PARAMETERS FOR A PERIOD OF THIRTY-SIX (36) MONTHS

1. INSTRUCTIONS TO BIDDERS

CONTENTS

1. Issuing of documents
2. Queries with respect to this bid
3. Completion of Bids
4. Submission of Bids
5. Signature on Bids
6. General Conditions of Bid
7. Form SBD 1
8. Preference Points
9. Bids to comply with documents
10. Telegraphic bids
11. The Department's right to decline any bid
12. Department is not liable for bidder's expenses
13. Payments made under this bid
14. Evaluation Criteria
15. Rejection of bids
16. Results of bids

INSTRUCTIONS TO BIDDERS

1. ISSUING OF DOCUMENTS

- (a) A complete set of bid documents are issued to a prospective Bidder. These documents are obtainable at:
ZWAMADAKA BUILDING
157 FRANCIS BAARD STREET
PRETORIA, 0002
- (b) Bidders must satisfy themselves that the document is complete and conform to the index of this document. Should any figures or writing be indistinct or should any pages be missing from this document or should this document or the drawing(s) contain any obvious errors, the Bidders must immediately notify the Department in order to have any discrepancy rectified or clarified before submitting his bid. Such clarification will be valid only if made by the Department by means of formal amendment as described hereunder prior to the date of submission of bids. The Department may issue amendments to clarify or modify the Bid Documents. A copy of each amendment will be issued to each bidder and shall be acknowledged on the form issued with the amendments. No claim whatsoever will be entertained for faults in the bid price resulting from the above-mentioned discrepancies.
- (c) No alterations, omissions or additions shall be made to this document, but should it be deemed necessary to do so, the Bidder is at liberty to qualify his bid.
- (d) All Bidders shall be deemed to have waived, renounced and abandoned any conditions printed or written upon any stationery used by them for the purpose of or in connection with the submission of bids which are in conflict with the conditions laid down in this document.

2. QUERIES WITH RESPECT TO THIS BID

Queries of a specific technical nature may be discussed personally or telephonically with Chris Lloyd telephone 051 405 9248

3. COMPLETION OF BIDS

- (a) The bid must be signed on the Invitation to Bid form (SBD 1) annexed hereto with all blanks in the bid and the appendix filled in.
- (b) All spaces in the bid forms and other annexures shall be completed in full.
- (c) The Technical Schedule contained in the bid document and the Pricing Schedule must be fully completed and priced out by the bidder. Failure to do so will deem your bid invalid.
- (d) The bid documents shall not be separated in any way nor must any pages be detached from the original documents.

4. SUBMISSION OF BIDS

- (a) The original Bid, together with a covering letter and supporting documents, shall be sealed in an envelope endorsed:

"ORIGINAL BID" FOR BID W11357 SUPPLY AND DELIVERY OF EQUIPMENT, SENSORS, APPLICATION SOFTWARE, VANDAL RESISTANT EQUIPMENT HOUSING AND ACCESSORIES FOR THE MEASUREMENT AND TRANSMISSION OF SURFACE- AND GROUNDWATER PARAMETERS FOR A PERIOD OF THIRTY-SIX (36) MONTHS

And the name of the Bidder shall be clearly shown.

- (b) Bids endorsed as above, will be received by: The Supply Chain Management Office or may be deposit in the bid box at the entrance of the Department of Water and Sanitation, Zwamadaka Building not later than **11:00** on the date stipulated on the front cover of this document.

5. SIGNATURE ON BIDS

The Bid, if by an individual, must be signed by that individual or by someone on his behalf duly authorised thereto and proof of such authority must be produced. If the bid is by a Company it must be signed by a person duly authorised thereto by a Resolution of a Board of Directors a copy of which Resolution, duly certified by the Chairman of the Company is to be submitted with the bid.

If the bid is submitted by joint venture of more than one person and/or Companies and/or firms it shall be accompanied by the following:

- (a) The original or a naturally certified copy of the original document under which such joint venture was constituted which must define precisely inter alia the conditions under which the joint venture will function, its period of duration and the participation of the several constituent persons and/or companies and/or firms.
- (b) A certificate signed by or on behalf of each participating person and/or company and/or firm authorising the person who signed the bid to do so.

6. GENERAL CONDITIONS OF BID

The General Conditions of Bid shall be regarded as an integral part of the bid documents.

7. FORM SBD 1

The copy of Form SBD 1 (Invitation to Bid), annexed to these documents, must be completed and signed by the Bidder. Failure to do so will deem your bid invalid.

8. PREFERENCE FOR EQUITY OWNERSHIP

Bidder desirous of claiming preference for equity ownership by previously disadvantaged individuals/women must fully complete and sign the Preference Certificate, Form SBD 6.1 or no preference will be allowed. A copy of your company registration forms and a valid accredited B-BBEE Status Level Verification Certificate **must** be submitted with the bid document.

NOTICE TO ALL POTENTIAL BIDDERS

PLEASE NOTE THAT PREFERENCE POINTS CLAIMED IN THE STANDARD BIDDING DOCUMENT PROVIDED WILL BE AUDITED BY AN INDEPENDENT PROFESSIONAL SERVICE PROVIDER. SUPPLIERS THAT PROVIDE INCORRECT OR FALSE INFORMATION REGARDING THE OWNERSHIP OF THEIR COMPANY, RUNS THE RISK OF BEING PROSECUTED WITH THE POSSIBLE RESTRICTION FROM PARTICIPATING IN BID WITH ANY DEPARTMENT IN THE SPHERE OF GOVERNMENT. PARTICULAR ATTENTION SHOULD BE GIVEN TO THE CONTENT OF SBD 6.1, PARAGRAPH 9.8.

9. BIDDERS TO COMPLY WITH DOCUMENTS

Where applicable, Bidders must allow in their Bids for all labour, material, machinery and everything necessary for the execution and completion of the Bid in accordance with the bid documents. No alterations may be made in the Invitation to Bid, Schedule of Quantities or other documents and the bid will be deemed to comply entirely with the terms of the documents.

10. TELEGRAPHIC BIDS

No bid forwarded by telegram, telex, facsimile, e-mail or similar apparatus will be considered.

11. THE DEPARTMENTS RIGHT TO DECLINE ANY BID

The Department does not bind itself to accept the lowest or any bid.

12. DEPARTMENT NOT LIABLE FOR BIDDER'S EXPENSES

The Department will not be held liable for any expenses incurred in preparing and submitting bids.

13. PAYMENTS UNDER THE BID

All payments due to the Bidder in terms of the bid will be done by means of Electronic Fund Transfer.

14. EVALUATION CRITERIA

Department of Water and Sanitation will evaluate all proposals in terms of the Preferential Procurement Regulations 2017. A copy of the Preferential Procurement Regulations 2017 can be downloaded from www.treasury.gov.za. In accordance with the Preferential Procurement Regulations 2017, submissions will be adjudicated on 80/20 points system and the evaluation criteria. A five phase evaluation criteria will be considered in evaluating the bid.

Phase 1: Pre-Qualification Criteria;

Phase 2: Administrative Compliance;

Phase 3: Mandatory compliance (if not complied with, bid will be disqualified);

Phase 4: Functional / Technical Evaluation;

Phase 5: Points awarded for Price and B-BBEE Status Level of Contribution (80/20 Preferential System).

PHASE 1: PRE-QUALIFICATION CRITERIA

Only bidders who are an EME Enterprises will be considered for this bid.

NB: Bidders who do not qualify with the prequalification criteria will be disqualified and not considered for phase 2.

PHASE 2: ADMINISTRATIVE COMPLIANCE

Bidders are required to comply with the following listed below: -

| No | Criteria | Yes | No |
|----|---|-----|----|
| 1 | Companies must be registered with National Treasury's Central Supplier Database. Provide proof of print out from CSD. | | |
| 2 | Tax compliant with SARS (to be verified through CSD and SARS). | | |
| 3 | Complete, sign, submit SBD 1, SBD 3.2, SBD 4, SBD 6.1, SBD 8, SBD 9 | | |

| | | | |
|--|--------------------------------------|------------|-----------|
| PHASE 3: MANDATORY COMPLIANCE | Take Note | | |
| Bidders are required to accurately complete and submit all documents which should form part of the bid submitted by closing date. | | | |
| COMPULSORY FORMS TO BE COMPLETED BY THE BIDDER AT CLOSING TIME OF BID | Indicate either “Yes” OR “No” | | |
| | | Yes | No |
| Appointment letter OR Certificate from the Manufacturer as distributor/authorized agent of the instrumentation in South Africa. | Comply | | |
| Appointment letter from the manufacturer / importer that qualifies the bidder to provide technical field assistance and training on the offered equipment. | Comply | | |
| Provide detailed brochures for all equipment offered (in English). | Comply | | |
| Capable to provide a certificate that prove that the offered equipment conforms to relevant ISO / BS/ DIN or EC ratings for the period of the bid; | Comply | | |

PHASE 4: FUNCTIONAL / TECHNICAL EVALUATION;

The bid will be evaluated using the specification criteria and failure to comply with all the specifications for the bided items as listed will render your bid as not to specification and non-responsive and the bid will not be considered for the phase 5 evaluations.

- (a) Standard Specifications as set out under Section 3: Specifications and the compliance thereof;
- (b) The bid will be rendered non-responsive if the bidder fails to complete the “Comply / Not Comply” section in the specification under Section 3: Specifications.
- (c) Functionality scoring:

| <p>The applicable values that will be utilized when scoring each criterion:</p> <p>1 = poor, 2 = average, 3 = good, 4 = very good, and 5 = excellent.</p> <p>Bidders must score a minimum qualifying score of 60% on functionality to qualify for further evaluation.</p> <p>Written proof must be supplied for all the criteria listed below:</p> | | Take Note |
|--|---|-------------------|
| CRITERIA | METHOD OF MEASURE | PERCENTAGE |
| Proof of previous experience in Surface- and Groundwater measurement in South Africa where preferably 3 years of reliable data was collected. | <p>The technical experience must be proven with three (3) reference letters for completed works from previous or current clients. The letters should be signed by an official at managerial level and above. Failure to satisfy this requirement will not be scored for these criteria. Number of years of experience shall be allocated values as follows:</p> <p>0 to 1 year = 1 1 to 3 years = 3 3 years & above = 5</p> | 25 |
| Capable to provide training and can demonstrate the equipment in detail for the duration of the bid (36 months). | <p>The capability of providing training and to demonstrate the equipment will be scored using the following criteria:</p> <p>Accreditation from Authorised Agent = 1 Accreditation from the Manufacturer = 3 Accreditation from the Manufacturer / Authorised Agent with in-house capability = 4 Accreditation from the Manufacturer / Authorised Agent with in-house capability and provide a detailed training and demonstration plan = 5</p> | 25 |
| Capable to provide technical- and support service on the equipment for the duration of the bid (36 months). | <p>The capability of providing technical and support service on the equipment will be scored using the following criteria:</p> <p>Accreditation from Authorised Agent = 1 Accreditation from the Manufacturer = 3 Accreditation from the Manufacturer / Authorised Agent with in-house capability = 4</p> | 25 |

| | | |
|--|--|------------|
| | Accreditation from the Manufacturer / Authorised Agent with in-house capability and provide a detailed technical and support service plan = 5 | |
| Number of years' experience of key people. | Letter / CV / Reference letter to proof the number of years' experience of the key people that would provide technical- and support service. 0 to 1 year = 1 1 to 3 years = 3 3 years & above = 5 | 25 |
| TOTAL | | 100 |

PHASE 5: THE 80/20 PRINCIPLE BASED ON PRICE AND BBBEE STATUS LEVEL OF CONTRIBUTION

In terms of Regulation 5 (2) and 6 (2) of the Preferential Procurement Regulations, preference points must be awarded to a bidder for attaining the B-BBEE status level of contribution in accordance with the table below:

| B-BBEE Status Level of Contributor | Number of points (80/20 system) |
|---|--|
| 1 | 20 |
| 2 | 18 |
| 3 | 14 |
| 4 | 12 |
| 5 | 8 |
| 6 | 6 |
| 7 | 4 |
| 8 | 2 |
| <i>Non-compliant contributor</i> | 0 |

15. REJECTION OF BID

Bids not complying with the above-mentioned requirements and specifications may be regarded as incomplete and may not be considered.

16. RESULTS OF BIDS

Results of non-acceptance of bids will be sent to individual unsuccessful bidders

TAX CLEARANCE CERTIFICATE REQUIREMENTS

It is a condition of bid that the taxes of the successful bidder must be in order, or that satisfactory arrangements have been made with South African Revenue Service (SARS) to meet the bidder's tax obligations.

- 1 In order to meet these requirement bidders are required to complete in full the attached form TCC 001 "Application for a Tax Clearance Certificate" and submit it to any SARS branch office nationally. The Tax Clearance Certificate Requirements are also applicable to foreign bidders / individuals who wish to submit bids.
- 2 SARS will then furnish the bidder with a Tax Clearance Certificate that will be valid for a period of 1 (one) year from the date of approval.
- 3 The original Tax Clearance Certificate must be submitted together with the bid. Failure to submit the original and valid Tax Clearance Certificate will result in the invalidation of the bid. Certified copies of the Tax Clearance Certificate will not be acceptable.
- 4 In bids where Consortia / Joint Ventures / Sub-bidders are involved, each party must submit a separate Tax Clearance Certificate.
- 5 Copies of the TCC 001 "Application for a Tax Clearance Certificate" form are available from any SARS branch office nationally or on the website www.sars.gov.za.
- 6 Applications for the Tax Clearance Certificates may also be made via e-Filing. In order to use this provision, tax payers will need to register with SARS as e-Filers through the website www.sars.gov.za.

Jeyrel:\Mdk416-SBD2 tax clearance

SBD 4

DECLARATION OF INTEREST

1. Any legal person, including persons employed by the state¹, or persons having a kinship with persons employed by the state, including a blood relationship, may make an offer or offers in terms of this invitation to bid (includes an advertised competitive bid, a limited bid, a proposal or written price quotation). In view of possible allegations of favouritism, should the resulting bid, or part thereof, be awarded to persons employed by the state, or to persons connected with or related to them, it is required that the bidder or his/her authorised representative declare his/her position in relation to the evaluating/adjudicating authority where-
 - The bidder is employed by the state; and/or
 - the legal person on whose behalf the bidding document is signed, has a relationship with persons/a person who are/is involved in the evaluation and or adjudication of the bid(s), or where it is known that such a relationship exists between the person or persons for or on whose behalf the declarant acts and persons who are involved with the evaluation and or adjudication of the bid.
2. **In order to give effect to the above, the following questionnaire must be completed and submitted with the bid.**
 - 2.1 Full Name of bidder or his or her representative:
 - 2.2 Identity Number:
 - 2.3 Position occupied in the Company (director, trustee, shareholder², member):
.....
 - 2.4 Registration number of company, enterprise, close corporation, partnership agreement or trust:
.....
 - 2.5 Tax Reference Number:
 - 2.6 VAT Registration Number:
 - 2.6.1 The names of all directors / trustees / shareholders / members, their individual identity numbers, tax reference Numbers and, if applicable, employee / PERSAL numbers must be indicated in paragraph 3 below.

¹"State" means –

- (a) any national or provincial department, national or provincial public entity or constitutional institution within the meaning of the Public Finance Management Act, 1999 (Act No. 1 of 1999);
- (b) any municipality or municipal entity;
- (c) provincial legislature;
- (d) national Assembly or the national Council of provinces; or
- (e) Parliament.

²"Shareholder" means a person who owns shares in the company and is actively involved in the management of the enterprise or business and exercises control over the enterprise.

- 2.7 Are you or any person connected with the bidder presently employed by the state? YES / NO
- 2.7.1 If so, furnish the following particulars:
- Name of person / director / trustee / shareholder/ member:
- Name of state institution at which you or the person connected to the bidder is employed :
- Position occupied in the state institution:
- Any other particulars:
.....
.....
.....
- 2.7.2 If you are presently employed by the state, did you obtain the appropriate authority to undertake remunerative work outside employment in the public sector? YES / NO
- 2.7.2.1 If yes, did you attach proof of such authority to the bid documents? YES / NO
- Note: Failure to submit proof of such authority, where applicable, may result in the disqualification of the bid.**
- 2.7.2.2 If no, furnish reasons for non-submission of such proof:
.....
.....
.....
- 2.8 Did you or your spouse, or any of the company's directors / trustees / shareholders / members or their spouses conduct business with the state in the previous twelve months? YES / NO
- 2.8.1 If so, furnish particulars:
.....
.....
.....
- 2.9 Do you, or any person connected with the bidder, have any relationship (family, friend, other) with a person employed by the state and who may be involved with the evaluation and or adjudication of this bid? YES / NO

2.9.1 If so, furnish particulars.

.....
.....
.....

2.10 Are you, or any person connected with the bidder,
aware of any relationship (family, friend, other) between
any other bidder and any person employed by the state
who may be involved with the evaluation and or adjudication
of this bid?

YES/NO

2.10.1 If so, furnish particulars.

.....
.....
.....

2.11 Do you or any of the directors / trustees / shareholders / members
of the company have any interest in any other related companies
whether or not they are bidding for this bid?

YES/NO

2.11.1 If so, furnish particulars:

.....
.....
.....

3. Full details of directors / trustees / members / shareholders.

| Full Name | Identity Number | Personal Income Tax Reference Number | State Employee Number / Persal Number |
|-----------|-----------------|---|--|
| | | | |
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| | | | |

4. DECLARATION

I, THE UNDERSIGNED (NAME).....

CERTIFY THAT THE INFORMATION FURNISHED IN PARAGRAPHS 2 and 3 ABOVE IS CORRECT.
I ACCEPT THAT THE STATE MAY REJECT THE BID OR ACT AGAINST ME SHOULD THIS DECLARATION
PROVE TO BE FALSE.

.....
Signature

.....
Date

.....
Position

.....
Name of bidder

November 2011

PREFERENCE POINTS CLAIM FORM IN TERMS OF THE PREFERENTIAL PROCUREMENT REGULATIONS 2017

This preference form must form part of all bids invited. It contains general information and serves as a claim form for preference points for Broad-Based Black Economic Empowerment (B-BBEE) Status Level of Contribution

NB: BEFORE COMPLETING THIS FORM, BIDDERS MUST STUDY THE GENERAL CONDITIONS, DEFINITIONS AND DIRECTIVES APPLICABLE IN RESPECT OF B-BBEE, AS PRESCRIBED IN THE PREFERENTIAL PROCUREMENT REGULATIONS, 2017.

1. GENERAL CONDITIONS

1.1 The following preference point systems are applicable to all bids:

- the 80/20 system for requirements with a Rand value of up to R50 000 000 (all applicable taxes included); and
- the 90/10 system for requirements with a Rand value above R50 000 000 (all applicable taxes included).

1.2

- a) The value of this bid is estimated to not exceed R50 000 000 (all applicable taxes included) and therefore the 80/20. Preference point system shall be applicable; or
- b) Either the 80/20 or 90/10 preference point system will be applicable to this tender (*delete whichever is not applicable for this tender*).

1.3 Points for this bid shall be awarded for:

- (a) Price; and
- (b) B-BBEE Status Level of Contributor.

1.4 The maximum points for this bid are allocated as follows:

| | POINTS |
|--|------------|
| PRICE | 80 |
| B-BBEE STATUS LEVEL OF CONTRIBUTOR | 20 |
| Total points for Price and B-BBEE must not exceed | 100 |

1.5 Failure on the part of a bidder to submit proof of B-BBEE Status level of contributor together with the bid, will be interpreted to mean that preference points for B-BBEE status level of contribution are not claimed.

1.6 The purchaser reserves the right to require of a bidder, either before a bid is adjudicated or at any time subsequently, to substantiate any claim in regard to preferences, in any manner required by the purchaser.

2. DEFINITIONS

- (a) **“B-BBEE”** means broad-based black economic empowerment as defined in section 1 of the Broad-Based Black Economic Empowerment Act;
- (b) **“B-BBEE status level of contributor”** means the B-BBEE status of an entity in terms of a code of good practice on black economic empowerment, issued in terms of section 9(1) of the Broad-Based Black Economic Empowerment Act;
- (c) **“bid”** means a written offer in a prescribed or stipulated form in response to an invitation by an organ of state for the provision of goods or services, through price quotations, advertised competitive bidding processes or proposals;
- (d) **“Broad-Based Black Economic Empowerment Act”** means the Broad-Based Black Economic Empowerment Act, 2003 (Act No. 53 of 2003);
- (e) **“EME”** means an Exempted Micro Enterprise in terms of a code of good practice on black economic empowerment issued in terms of section 9 (1) of the Broad-Based Black Economic Empowerment Act;
- (f) **“functionality”** means the ability of a tenderer to provide goods or services in accordance with specifications as set out in the tender documents.
- (g) **“prices”** includes all applicable taxes less all unconditional discounts;
- (h) **“proof of B-BBEE status level of contributor”** means:
 - 1) B-BBEE Status level certificate issued by an authorized body or person;
 - 2) A sworn affidavit as prescribed by the B-BBEE Codes of Good Practice;
 - 3) Any other requirement prescribed in terms of the B-BBEE Act;
- (i) **“QSE”** means a qualifying small business enterprise in terms of a code of good practice on black economic empowerment issued in terms of section 9 (1) of the Broad-Based Black Economic Empowerment Act;
- (j) **“rand value”** means the total estimated value of a bid in Rand, calculated at the time of bid invitation, and includes all applicable taxes;

3. POINTS AWARDED FOR PRICE

3.1 THE 80/20 OR 90/10 PREFERENCE POINT SYSTEMS

A maximum of 80 or 90 points is allocated for price on the following basis:

80/20 or 90/10

$$P_s = 80 \left(1 - \frac{P_t - P_{\min}}{P_{\min}} \right) \quad \text{or} \quad P_s = 90 \left(1 - \frac{P_t - P_{\min}}{P_{\min}} \right)$$

Where

P_s = Points scored for price of bid under consideration

P_t = Price of bid under consideration

P_{\min} = Price of lowest acceptable bid

4. POINTS AWARDED FOR B-BBEE STATUS LEVEL OF CONTRIBUTOR

- 4.1 In terms of Regulation 6 (2) and 7 (2) of the Preferential Procurement Regulations, preference points must be awarded to a bidder for attaining the B-BBEE status level of contribution in accordance with the table below:

| B-BBEE Status Level of Contributor | Number of points (90/10 system) | Number of points (80/20 system) |
|------------------------------------|---------------------------------|---------------------------------|
| 1 | 10 | 20 |
| 2 | 9 | 18 |
| 3 | 6 | 14 |
| 4 | 5 | 12 |
| 5 | 4 | 8 |
| 6 | 3 | 6 |
| 7 | 2 | 4 |
| 8 | 1 | 2 |
| Non-compliant contributor | 0 | 0 |

5. BID DECLARATION

- 5.1 Bidders who claim points in respect of B-BBEE Status Level of Contribution must complete the following:

6. B-BBEE STATUS LEVEL OF CONTRIBUTOR CLAIMED IN TERMS OF PARAGRAPHS 1.4 AND 4.1

- 6.1 B-BBEE Status Level of Contributor: . =(maximum of 10 or 20 points)
(Points claimed in respect of paragraph 7.1 must be in accordance with the table reflected in paragraph 4.1 and must be substantiated by relevant proof of B-BBEE status level of contributor.

7. SUB-BIDING

- 7.1 Will any portion of the bid be sub-bided?

(***Tick applicable box***)

| | | | |
|-----|--------------------------|----|--------------------------|
| YES | <input type="checkbox"/> | NO | <input type="checkbox"/> |
|-----|--------------------------|----|--------------------------|

- 7.1.1 If yes, indicate:

- i) What percentage of the bid will be subbided.....%
- ii) The name of the sub-bidder.....
- iii) The B-BBEE status level of the sub-bidder.....
- iv) Whether the sub-bidder is an EME or QSE

(***Tick applicable box***)

| | | | |
|-----|--------------------------|----|--------------------------|
| YES | <input type="checkbox"/> | NO | <input type="checkbox"/> |
|-----|--------------------------|----|--------------------------|

- v) Specify, by ticking the appropriate box, if subbiding with an enterprise in terms of Preferential Procurement Regulations,2017:

| Designated Group: An EME or QSE which is at last 51% owned by: | EME √ | QSE √ |
|---|-----------------|-----------------|
| Black people | | |
| Black people who are youth | | |
| Black people who are women | | |
| Black people with disabilities | | |
| Black people living in rural or underdeveloped areas or townships | | |
| Cooperative owned by black people | | |
| Black people who are military veterans | | |
| OR | | |
| Any EME | | |
| Any QSE | | |

8. DECLARATION WITH REGARD TO COMPANY/FIRM

8.1 Name of company/firm:
.....

8.2 VAT registration number:
.....

8.3 Company registration number:
.....

8.4 TYPE OF COMPANY/ FIRM

- ☐ Partnership/Joint Venture / Consortium
- ☐ One person business/sole propriety
- ☐ Close corporation
- ☐ Company
- ☐ (Pty) Limited

[TICK APPLICABLE BOX]

8.5 DESCRIBE PRINCIPAL BUSINESS ACTIVITIES

.....
.....
.....
.....

8.6 COMPANY CLASSIFICATION

- ☐ Manufacturer
- ☐ Supplier
- ☐ Professional service provider
- ☐ Other service providers, e.g. transporter, etc.

[TICK APPLICABLE BOX]

8.7 Total number of years the company/firm has been in business:
.....

8.8 I/we, the undersigned, who is / are duly authorised to do so on behalf of the company/firm, certify that the points claimed, based on the B-BBE status level of contributor indicated in paragraphs 1.4 and 6.1 of the foregoing certificate, qualifies the company/ firm for the preference(s) shown and I / we acknowledge that:

- i) The information furnished is true and correct;
- ii) The preference points claimed are in accordance with the General Conditions as indicated in paragraph 1 of this form;
- iii) In the event of a bid being awarded as a result of points claimed as shown in paragraphs 1.4 and 6.1, the bidder may be required to furnish documentary proof to the satisfaction of the purchaser that the claims are correct;
- iv) If the B-BBEE status level of contributor has been claimed or obtained on a fraudulent basis or any of the conditions of bid have not been fulfilled, the purchaser may, in addition to any other remedy it may have –
 - (a) disqualify the person from the bidding process;
 - (b) recover costs, losses or damages it has incurred or suffered as a result of that person's conduct;
 - (c) cancel the bid and claim any damages which it has suffered as a result of having to make less favourable arrangements due to such cancellation;
 - (d) recommend that the bidder or bidder, its shareholders and directors, or only the shareholders and directors who acted on a fraudulent basis, be restricted by the National Treasury from obtaining business from any organ of state for a period not exceeding 10 years, after the *audialterampartem* (hear the other side) rule has been applied; and
 - (e) forward the matter for criminal prosecution.

WITNESSES

1.

2.

.....
SIGNATURE(S) OF BIDDERS(S)

DATE:

ADDRESS

.....

.....

DECLARATION OF BIDDER'S PAST SUPPLY CHAIN MANAGEMENT PRACTICES

1. This Standard Bidding Document must form part of all bids invited.
2. It serves as a declaration to be used by institutions in ensuring that when goods and services are being procured, all reasonable steps are taken to combat the abuse of the supply chain management system.
3. The bid of any bidder may be disregarded if that bidder, or any of its directors have-
 - a. abused the institution's supply chain management system;
 - b. committed fraud or any other improper conduct in relation to such system; or
 - c. failed to perform on any previous bid.
4. In order to give effect to the above, the following questionnaire must be completed and submitted with the bid.

| Item | Question | Yes | No |
|-------|--|---------------------------------|--------------------------------|
| 4.1 | Is the bidder or any of its directors listed on the National Treasury's Database of Restricted Suppliers as companies or persons prohibited from doing business with the public sector? (Companies or persons who are listed on this Database were informed in writing of this restriction by the Accounting Officer/Authority of the institution that imposed the restriction after the audialterampartem rule was applied). The Database of Restricted Suppliers now resides on the National Treasury's website (www.treasury.gov.za) and can be accessed by clicking on its link at the bottom of the home page. | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| 4.1.1 | If so, furnish particulars: | | |
| 4.2 | Is the bidder or any of its directors listed on the Register for Tender Defaulters in terms of section 29 of the Prevention and Combating of Corrupt Activities Act (No 12 of 2004)? The Register for Tender Defaulters can be accessed on the National Treasury's website (www.treasury.gov.za) by clicking on its link at the bottom of the home page. | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| 4.2.1 | If so, furnish particulars: | | |
| 4.3 | Was the bidder or any of its directors convicted by a court of law (including a court outside of the Republic of South Africa) for fraud or corruption during the past five years? | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| 4.3.1 | If so, furnish particulars: | | |
| 4.4 | Was any bid between the bidder and any organ of state terminated during the past five years on account of failure to perform on or comply with the bid? | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| 4.4.1 | If so, furnish particulars: | | |

CERTIFICATION

I, THE UNDERSIGNED (FULL NAME).....
CERTIFY THAT THE INFORMATION FURNISHED ON THIS DECLARATION FORM IS TRUE AND CORRECT.

I ACCEPT THAT, IN ADDITION TO CANCELLATION OF A BID, ACTION MAY BE TAKEN AGAINST ME
SHOULD THIS DECLARATION PROVE TO BE FALSE.

.....
Signature

.....
Date

.....
Position

.....
Name of Bidder

Js365bW

DEPARTMENT OF WATER AND SANITATION**INSTRUCTIONS TO BIDDERS: PURCHASES**

1. The standard bidding forms should not be retyped or redrafted but photocopies may be prepared and used. Additional offers may be made of any item but only on a photocopy of the page in question or on other forms obtainable from the Head of Procurement: DEPARTMENT OF WATER AND SANITATION, Private Bag X313, Pretoria, 0001, Attention: Supply Chain Management Office. Additional offers made in any other manner may be disregarded.
2. Should standard bid forms not be filled in by means of mechanical devices, for example typewriters, ink, preferably black, must be used to fill in bids.
3. Bidders shall check the numbers of the pages and satisfy themselves that none are missing or duplicated. No liability shall be accepted in regard to claims arising from the fact that pages are missing or duplicated.
4. Where items are specified in detail, the specifications form an integral part of the bid document and bidders shall indicate in the space provided whether the items offered are to specification or not.
5. In respect of the paragraphs where the items offered are strictly to specification, bidders shall insert the words "as specified".
6. In cases where the items are not to specification, the deviations from the specifications shall be indicated.
7. The bid prices shall be given in the units shown.
8. With the exception of basic prices, where required, all prices shall be quoted in South African currency.
9. Delivery basis:
 - (a) Supplies which are held in stock or are in transit or on order from South African manufacturers at the date of bid shall be offered on a basis of delivery into consignee's store or on his site within the free delivery area of the bidder's centre, or carriage paid consignee's station if the goods are required elsewhere.
 - (b) Notwithstanding the provisions of paragraph 9(a), bid prices for supplies in respect of which installation/erection/assembly is a requirement, shall include ALL costs on a basis of delivered on site as specified.
10. Unless specifically provided for in the bid document, no bids transmitted by telegram, telex, facsimile, e-mail or similar apparatus shall be considered.
11. Bids received after the closing date and time are late and will as a rule not be accepted for consideration.

12. Bids will be opened in public, that is, bidders or their representatives may be present. If requested by any bidder, the names of bidders and if practical the total amount of each bid and of any alternative bids, will be read aloud.
13. The period for which offers are to remain valid and binding is indicated in the bid documents and is calculated from the closing date on the understanding that offers are to remain in force and binding until the close of business on the last day of the period calculated and if this day falls on a Saturday, Sunday or public holiday, the bid is to remain valid and binding until the close of business on the following working day.

14. After public opening of bids, information relating to the examination, clarification and evaluation of bids and recommendations concerning awards will not be disclosed to bidders or other persons not officially concerned with the process, until the successful bidder is notified of the award. The bid documentation of bidders is considered to be confidential and will under no circumstances be made available to other bidders or other persons.
15. If you are a supplier but not the actual manufacturer and will be sourcing the product(s) from another company, a letter from that company (ies)/supplier(s) confirming firm supply arrangement(s) in this regard, has to accompany your bid and failure to submit the document may invalidate your bid.
 - 15.1 The said company/supplier must confirm that it has familiarised itself with the item descriptions, specifications and bid conditions and if the bid consist of more than one item it should be clearly indicated in respect of which item(s) the supportive letter has been issued.
16. The financial standing of bidders and their ability to manufacture or to supply goods or to render a service may be examined before their bids are considered for acceptance.
17. The Department may, where a bid relates to more than one item, accept such bid in respect of any specific item or items and also accept part of the specified quantity of any specific item or items.
18. The Department is not obliged to accept any bid. The evaluation of a bid will be done in accordance with the Preferential Procurement Policy Framework Act, 2000 (Act no. 5 of 2000) and its regulations.
19. After approval of the bid, both parties must sign a written bid. The Bid Form must be filled in duplicate by both the successful bidder and the purchaser. Both Bid Forms must be signed in the original so that the successful bidder and the purchaser would be in possession of originally signed bids for their respective records.
- 19.1 Failure of the successful bidder to sign the Bid Form in ink may result in the invalidation of their bid.

Special Conditions of Bid: Purchases
November 2011

CERTIFICATE OF INDEPENDENT BID DETERMINATION

1. This Standard Bidding Document (SBD) must form part of all bids¹ invited.
2. Section 4 (1) (b) (iii) of the Competition Act No. 89 of 1998, as amended, prohibits an agreement between, or concerted practice by, firms, or a decision by an association of firms, if it is between parties in a horizontal relationship and if it involves collusive bidding (or bid rigging). ² Collusive bidding is a pe se prohibition meaning that it cannot be justified under any grounds.
3. Treasury Regulation 16A9 prescribes that accounting officers and accounting authorities must take all reasonable steps to prevent abuse of the supply chain management system and authorizes accounting officers and accounting authorities to:
 - a. disregard the bid of any bidder if that bidder, or any of its directors have abused the institution's supply chain management system and or committed fraud or any other improper conduct in relation to such system.
 - b. cancel a bid awarded to a supplier of goods and services if the supplier committed any corrupt or fraudulent act during the bidding process or the execution of that bid.
4. This SBD serves as a certificate of declaration that would be used by institutions to ensure that, when bids are considered, reasonable steps are taken to prevent any form of bid-rigging.
5. In order to give effect to the above, the attached Certificate of Bid Determination (SBD 9) must be completed and submitted with the bid:

¹ Includes price quotations, advertised competitive bids, limited bids and proposals.

² Bid rigging (or collusive bidding) occurs when businesses, that would otherwise be expected to compete, secretly conspire to raise prices or lower the quality of goods and / or services for purchasers who wish to acquire goods and / or services through a bidding process. Bid rigging is, therefore, an agreement between competitors not to compete.

CERTIFICATE OF INDEPENDENT BID DETERMINATION

I, the undersigned, in submitting the accompanying bid:

(Bid Number and Description)

in response to the invitation for the bid made by:

(Name of Institution)

do hereby make the following statements that I certify to be true and complete in every respect:

I certify, on behalf of:

(Name of Bidder)

that:

1. I have read and I understand the contents of this Certificate;
2. I understand that the accompanying bid will be disqualified if this Certificate is found not to be true and complete in every respect;
3. I am authorized by the bidder to sign this Certificate, and to submit the accompanying bid, on behalf of the bidder;
4. Each person whose signature appears on the accompanying bid has been authorized by the bidder to determine the terms of, and to sign the bid, on behalf of the bidder;
5. For the purposes of this Certificate and the accompanying bid, I understand that the word "competitor" shall include any individual or organization, other than the bidder, whether or not affiliated with the bidder, who:
 - (a) has been requested to submit a bid in response to this bid invitation;
 - (b) could potentially submit a bid in response to this bid invitation, based on their qualifications, abilities or experience; and
 - (c) provides the same goods and services as the bidder and/or is in the same line of business as the bidder
6. The bidder has arrived at the accompanying bid independently from, and without consultation, communication, agreement or arrangement with any competitor. However communication between partners in a joint venture or consortium³ will not be construed as collusive bidding.
7. In particular, without limiting the generality of paragraphs 6 above, there has been no consultation, communication, agreement or arrangement with any competitor regarding:
 - (a) prices;
 - (b) geographical area where product or service will be rendered (market allocation)
 - (c) methods, factors or formulas used to calculate prices;
 - (d) the intention or decision to submit or not to submit, a bid;
 - (e) the submission of a bid which does not meet the specifications and conditions of the bid; or
 - (f) bidding with the intention not to win the bid.

8. In addition, there have been no consultations, communications, agreements or arrangements with any competitor regarding the quality, quantity, specifications and conditions or delivery particulars of the products or services to which this bid invitation relates.
9. The terms of the accompanying bid have not been, and will not be, disclosed by the bidder, directly or indirectly, to any competitor, prior to the date and time of the official bid opening or of the awarding of the bid.

³ Joint venture or Consortium means an association of persons for the purpose of combining their expertise, property, capital, efforts, skill and knowledge in an activity for the execution of a bid.

SBD 9

10. I am aware that, in addition and without prejudice to any other remedy provided to combat any restrictive practices related to bids and bids, bids that are suspicious will be reported to the Competition Commission for investigation and possible imposition of administrative penalties in terms of section 59 of the Competition Act No 89 of 1998 and or may be reported to the National Prosecuting Authority (NPA) for criminal investigation and or may be restricted from conducting business with the public sector for a period not exceeding ten (10) years in terms of the Prevention and Combating of Corrupt Activities Act No 12 of 2004 or any other applicable legislation.

.....
Signature

.....
Date

.....
Position

Name of Bidder

Js914w 2

SECTION 2: **CONDITIONS OF BID**

CONTENTS

- A. GENERAL CONDITIONS OF BID
- B. SPECIAL CONDITIONS OF BID

SECTION 2: **CONDITIONS OF BID**

A. GENERAL CONDITIONS OF BID

The Bid shall be governed by: “General Conditions of Bid”, which is attached to this bid document.

The only variations from these General Conditions of Bid shall be given in the Special conditions of Bid below.

SECTION 2: **CONDITIONS OF BID**

B. SPECIAL CONDITIONS OF BID

This section must be completed in full failure to do so may invalidate your bid

***Delete which are not applicable**

1. Is the offer strictly in accordance with the conditions and specifications?

***YES / NO**

If not in accordance with the specification, furnish the deviations.

2. Period required for commencement with service after receipt of order.

3. Are you registered in terms of section 23(1) or 23(3) of the value Added Tax Act, 1991 (Act no 89 of 1991)?

***YES / NO**

If so, state your VAT registration number.

4. Is the bid price firm for the duration of the bid period?

***YES / NO**

5. **The DEPARTMENT OF WATER AND SANITATION will not entertain any claims for non-firm price increases claimed at a later state. No exception will be made in this regard.**

TAKE NOTE

6. It is a specific condition of this bid with DWS, that consultants awarded this bid undertake not to divulge to others, or use for their own benefit, confidential information gained during the course of the work.

In terms of section 21(2) of the Copyright act (Act no.98 of 1978) ("the Act ") the copyright regarding a work that is made under the direction or control of the State is owned by the state. Section 2(1) of the Act provides that the term "works", if they are original, include literary works, musical works artistic works, cinematograph films, sound recordings, broadcasts, programme-carrying signals, published editions and computer programs.

SECTION 3: STANDARD SPECIFICATIONS

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A. GENERAL REQUIREMENTS

- 1. GENERAL:**
- 2. ENVIRONMENTAL CONDITIONS**
- 3. TESTS:**
- 4. TEST EQUIPMENT AND SPARES:**
- 5. TECHNICAL SCHEDULE:**
- 6. GENERAL TECHNICAL AND OTHER REQUIREMENTS:**
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- 1. SCOPE**
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- 3. DOCUMENTATION**
- 4. DATA BASE COMPILATION AND BUILDING**

SECTION 3: STANDARD SPECIFICATIONS

A. GENERAL REQUIREMENTS

1. GENERAL:

- 1.1. This Standard Specification describes the general requirements with regard to material, equipment and workmanship and should be read together with the General Conditions of Bid, Order, Detail Specifications and Schedules.
- 1.2. Where any conflict exists, the relevant clauses of the Detail Specification shall take preference over the clauses of the Standard Technical Specification.
- 1.3. Should any conflict arise between the requirements of this standard specification and the General Conditions of Bid, the General Conditions of Bid would take preference.
- 1.4. The services required in terms of this specification shall comply with all the requirements of this specification, read together with the detail specification.
- 1.5. The Bidder shall be deemed to have examined all the constituent parts of this document carefully before the bid was submitted. Any doubts as to the meaning of any terms, phrases or clauses of the document, or any missing pages, shall be submitted to the Department in writing before a bid is submitted. No claims traceable to non-compliance with this clause will be considered.
- 1.6. If it is found at any stage of this bid that the Bidder has deviated from the requirements of this specification without the written consent of the Department, then the Department shall have the right to order the Bidder to remove the item(s) in question and to supply and/or install the exact equipment specified without any adjustment in the bid price.
- 1.7. Definitions:
 - 1.7.1 For the purposes of this bid all terms used shall be as defined in section 2 of SABS code 0142-1981, Article 1 of the Machinery and Occupational Safety Act, No 6 of 1983 and other relevant SABS specifications.

2. ENVIRONMENTAL CONDITIONS

- 2.1 The equipment shall be designed to function satisfactorily under the following conditions:
 - 2.1.1 Temperature range:

| | | |
|---|--------------|------------------|
| - | Storage: | -50° C to +85° C |
| - | Operating: | -40° C to +70° C |
| - | Display (On) | -20° C to +70° C |
 - 2.1.2 Relative humidity (non-condensing): 5% to 95%,

2.1.3 Elevation: 0 to 3 500 m above sea level.

2.1.4 The equipment shall be designed to operate without degradation under dusty conditions experienced at exposed sites.

3. TESTS:

3.1 The Department reserves the right to instruct the successful Bidder to submit test samples of the offered equipment, sensors, application software, vandal resistant equipment housing and accessories to be tested for the following, before final awarding of the contract:

3.1.1 Compliance with the limits on the emission of radio frequency interference, as controlled in terms of the Radio Act.

3.1.2 Satisfactory operation of the equipment at the extremes of the ambient operation conditions specified.

3.1.3 The cost for the performance of these tests shall be for the Bidder's account.

3.2 It is a condition of this bid that, on request of the Department, the Bidder shall be able to demonstrate, within 2 weeks, after the closure of the bid, a unit of the equipment offered to the Department before the bid shall be awarded. On request of the Department, the Bidder shall install the unit/item at the Department's testing facility at Pretoria West, for evaluation of the equipment's performance. The Department will submit this request within two weeks after the closing date of this bid. The bid will be awarded after the Department is fully satisfied with the testing results performed at the testing facility.

Failure to comply with these requests will invalidate the bid offer.

3.3 All materials and workmanship shall be of the respective kinds described in the bid and in accordance with the Department's instructions and shall be subjected from time to time to such tests and by such persons as the Department may direct at the place of manufacture or fabrication or on the site or at all or any of such places. Excepts as otherwise provided in the specification the Bidder shall supply such assistance, instruments, machines, labour and materials as are normally required for examining, measuring and testing of any work and the quality, mass or quantity of any materials used and shall supply samples of material before incorporation in the works for testing as may be selected and required by the Department.

3.4 All samples shall be supplied by the Bidder at his own cost if the supply thereof is clearly intended by or provided for in the specification but if not, then at the cost of the Department.

- 3.5 The cost of making any test shall be borne by the Bidder if such test is clearly intended by or provided for in the specification and (in the case only of a test under load or a test to ascertain whether the design of any finished or partly finished work is appropriate for the purposes which it was intended to fulfil) if such is particularised in the specification in sufficient detail to enable the Bidder to price or allow for the same in his bid.
- 3.6 If any test is ordered by the Department which is either-
- a) not so intended by or provided for; or
 - b) not so particularised; or
 - c) though so intended by or provided for is ordered by the Department to be carried out by an independent person or body at any other place than the site or the place of manufacture or fabrication of the materials or equipment tested; then the cost of such test shall be borne by the Bidder if the test shows the workmanship of materials not to be in accordance with the provisions of the bid or the Department's instructions, but otherwise by the Department.

4. TEST EQUIPMENT AND SPARES:

- 4.1 It is a requirement of this bid that the Bidder shall have available all the test equipment that would be required to allow the Department's staff to commission any part of any system provided in terms of this bid.
- 4.2 The exact test equipment required will depend on the systems supplied and the Bidder shall submit a complete list of the test equipment to be used.
- 4.3 The Bidder shall recommend spares that would be required on site for emergency repairs, complete with unit costs for consideration by the Department.

5. TECHNICAL SCHEDULE:

- 5.1 Bidders are advised that it is in their own interest to provide accurate and detailed information in answer to all the questions asked in the Technical Schedules, which appear in Section 5 of this specification.

Failure to comply with this request will invalidate the bid offer.

6. GENERAL TECHNICAL AND OTHER REQUIREMENTS:

- 6.1 All submersible instrumentation shall function reliably in water with a high saline content as well as a high silt content, including various chemical pollutants (including sulphates and phosphates) originating from agricultural run-off and other human sources.

- 6.2 Only high quality equipment capable of offering extended service under arduous, hostile conditions in a long-term installation, on unmanned sites, shall be offered.
- 6.3 All instrumentation shall fully comply or exceed the specifications laid down in this Section. No deviation from the specified standards will be accepted.
- 6.4 Only microprocessor-controlled, frequency-synthesis instrumentation incorporating the latest in surface-mount technology shall be acceptable.
- 6.5 Bidders shall not offer instrumentation that has been superseded by later models or that will be discontinued in the near future. All instrumentation offered shall be of the most recent design. Should the Bidder be aware of any impending modifications or new equipment he / she shall state the expected implications of such in his / her offer.
- 6.6 Except when otherwise specified, all equipment shall be suitably protected against lightning and surge damage, up to 2 kV; the relevant test certificates should preferably accompany the bid offer or shall be made available on request to the Department.
- 6.7 Labels:
 - 6.7.1 The instrumentation shall have durable, clearly legible labels, indicating the make, model, serial number, ratings and other relevant information.
- 6.8 Mounting Brackets:
 - 6.8.1 All mounting brackets for the instrumentation, where applicable, need to be robust and be insensitive to impact and vibration. Where possible, it should be manufactured from corrosion-resistant material, preferably stainless steel, or the equivalent thereof.
- 6.9 All data logger software updates will be supplied free of charge during the contract period. These upgrades will be delivered / sent / emailed by the bidder to the relevant offices, which make use of the bidder's equipment.
- 6.10 Should the Bidder or Manufacturing Company do any additional development during the contract period, on any item awarded to him / her, the Bidder will inform the Department in writing of such action. The Bidder will also outline what the effect it will have on the current contract and/or equipment.
- 6.11 Should a newly developed model of any of the offered equipment be introduced into the open market, the Bidder can supply such equipment on the following conditions:
- 6.12 The Department will be informed in writing and only after the equipment has been tested and satisfying results have been obtained, the Department can approve such action.
- 6.13 The Department will still have the option to purchase the older model.
- 6.14 The newly developed item will be offered at no additional cost.

7. REGULATIONS AND STANDARDS:

- 7.1 All material and equipment supplied shall be new and of an acceptable quality.
- 7.2 Any conflict that should arise between any of the above mentioned regulations and this specification shall forthwith be referred to the Department in writing for his ruling. Under no circumstances shall the Bidder modify any part of the works to comply with amended regulations that may come in force during the construction period before the matter has been cleared with the Department.

8. SCHEDULES OF PRICES:

- 8.1 The attention of Bidders is drawn to the Schedules of Prices which form part of this specification and which are to be completed in full.

Failure to comply with this request will invalidate the bid offer.

9. TRAINING OF PERSONNEL:

- 9.1 Training provided by the Bidder shall be directly applicable to the actual equipment to be used at the installation. All training shall be carried out on site, unless otherwise requested by the Department.
- 9.2 Three categories of training for technical personnel are required, viz:
- 9.1.1 Installation training;
 - 9.1.2 Operation training;
 - 9.1.3 Maintenance training.
- 9.2 The Department will bear the cost of salaries, accommodation and other allowances and travelling expenses of its personnel, but all other expenses shall be borne by the Bidder. The Bidder shall provide all course material including manuals.
- 9.3 The Bidder shall indicate his proposals and local facilities to provide training in particular aspects of operation and maintenance of the equipment being offered.
- 9.4 Training courses shall be made available and completed within the period of six months after the bid is awarded.
- 9.5 At the conclusion of the training periods, both in regard to the operation and maintenance of the equipment, the Department will give the Bidder a signed statement to the effect that these training sessions were adequate.

10. STANDARD AND SPECIFICATION

10.1 The offered equipment with regard to its operational performance is to be in strict accordance with each and every term of the documents listed below:

10.1.1 The Standard Specifications - Section 3.

10.1.2 The Detail Specifications - Section 4.

10.1.3 The information provided in the Technical Schedules - Section 5.

10.2 The Bidder shall be required to provide back-up and maintenance on all the equipment supplied.

10.3 Next to each detail specification a block is provided for the bidder to complete the following:

10.3.1 Offered equipment / item to specification - ☐ Y or ☐ ✓

10.3.2 Offered equipment / item not to specification ☐ N - ☐ X or
(Refer to Paragraph 10.3.3, below.)

10.3.3 Should the bidder not be sure if offered equipment / item is to ☐ ?
specification:

10.3.4 The bidder must initialise each page, he/she has filled and completed.

11. DEVIATIONS FROM THE SERVICES TO BE RENDERED:

11.1 If, in their offers to meet these specifications, there are any deviations whatsoever from any of the provisions, or from any of the terms set out in paragraph 2 (Standards and Specifications), then Bidders shall list each and every deviation in Section 1. (Annexure A). The list, which shall accompany the bid offer, shall be so numbered as to correlate each deviation from the relative paragraph contained in the documents listed at 2.1. above.

Failure on the part of any Bidder to meet this requirement in full shall signify compliance with the terms and conditions of the contract.

SECTION 3: STANDARD SPECIFICATIONS

B. SOFTWARE AND SOFTWARE DOCUMENTATION

1. SCOPE:

- 1.1 This specification covers the design and documentation requirements for software supplied under this bid.

2. SYSTEM DESIGN:

- 2.1 The system shall make use of a well-defined, standard, tested, debugged and field-proven operating system to control other programme modules which handle the user functional requirements. The operating system shall be capable of handling all input/output organization, scheduling, time-keeping, power failure procedures and to control communications with field hardware and operator devices, process system outputs and command requests.
- 2.2 The operating system shall initialize software upon restart conditions and allocate memory usage of application programmes. Furthermore, the operating system shall enable the system operator to create, store and run application and user programmes while operating system is busy controlling the real time application system. This user programme modifying facility should be menu driven under operating system control to enable operations to easily effect user system changes.
- 2.3 The operating system shall preferably reside in firmware and the software shall be task orientated, with linking and synchronisation possible between tasks. Tasks shall be allocated priorities and shall be able to control themselves relative to real-time so that the complete system is not "hung-up" by a faulty input device, such as chattering alarm relay.

3. DOCUMENTATION:

The successful Bidder shall supply full software documentation within two months after the delivery date of the equipment.

Four copies of each of the following shall be provided:

- 3.1 A system manual containing detailed description of the operating system and the drivers of each software module, task or sub-module used. This description shall clearly specify the functions and structure of each module and the interfaces and links between them. This manual shall also describe how new software modules can be added, running under the same operating system.

- 3.2 A manual containing a complete set of programme listings.
- 3.3 An operator's manual, specifying all the system operating procedures in detail, for each system forming part of this bid.
- 3.4 A software user's manual (for each system) providing detailed information on how additions to the system can be generated, for instance the addition of an out-station, creation of a new access control category etc., or how system parameters can be changed or deleted. This manual should avoid the use of computer system jargon, shall include a definition of terms used and shall be written in such a way that operators without formal computer hardware or software training will be able to effect the changes as far as possible.

4. DATA BASE COMPILATION AND BUILDING:

- 4.1 The successful Bidder shall create, edit, debug and put into operation the initial data base required for each system to be supplied in terms of this document. The data base shall be compiled and built from the specified parameters and from information which will be supplied by the Department where applicable.
- 4.2 Bidders are, therefore, required to allow for the compilation of the required data basis in their bids.

SECTION 4: DETAIL SPECIFICATIONS

CONTENTS

A. SURFACE- AND GROUNDWATER EQUIPMENT, SENSORS, APPLICATION SOFTWARE AND ACCESSORIES

1. SCOPE:

2. STAND-ALONE DATA LOGGING EQUIPMENT:

- 2.1. Single channel data logger;
- 2.2. Multi-channel data logger;

3. INTEGRATED DATA LOGGER WITH INTEGRATED SENSORS:

- 3.1. Single channel data logger with integrated sensor: shaft encoder;
- 3.2. Single channel data logger with integrated sensor: pressure transducer (vented);
- 3.3. Single channel data logger with integrated sensor: barometric pressure;
- 3.4. Multi-channel data logger with integrated sensors: pressure transducer (vented) and temperature sensor;
- 3.5. Multi-channel data logger with integrated sensors: pressure transducer (vented) and temperature sensor with integrated GSM modem;
- 3.6. Multi-channel data logger with integrated sensors: pressure transducer (vented), temperature- and conductivity sensor with integrated GSM modem;
- 3.7. Multi-channel data logger with integrated sensors: pressure transducer (non-vented) and temperature sensor.
- 3.8. Multi-channel data logger with integrated sensors: pressure transducer (non-vented) and temperature sensor; with barometric pressure compensator.
- 3.9. Multi-channel data logger with integrated sensors: pressure transducer (non-vented), temperature- and conductivity sensor.
- 3.10. Multi-channel data logger with integrated sensors: pressure transducer (non-vented), temperature- and conductivity sensor; with barometric pressure compensator:
- 3.11. Multi-channel data logger with integrated pressure (non-vented), temperature and conductivity sensors – for unattended deployment with no cables attached:
- 3.12. Multi-channel data logger with integrated pressure (non-vented), temperature and conductivity sensors, with practical salinity scale output – for unattended deployment with no cables attached:
- 3.13. Multi-channel data logger with integrated level, temperature and conductivity sensors – for permanent submerged deployment with fixed (non-removable) communication cable and vented tube:
- 3.14. Multi-channel data logger with integrated sensors: pressure transducer (vented), temperature- and conductivity sensor.
- 3.15. Multi-channel data logger with integrated sensors: pressure transducer, temperature- and conductivity sensor, with built-in GPS and Bluetooth communication:
- 3.16. Multi-channel data logger with integrated sensors: pressure transducer and water velocity measurement for use in large streams;

- 3.17. Multi-channel data logger with integrated sensors: pressure transducer and water velocity measurement for use in medium streams;
- 3.18. Multi-channel data logger with integrated sensors: pressure transducer and water velocity measurement for use in small streams;
- 3.19. Multi-channel data logger with integrated sensors: pressure transducer and water velocity measurement for use in shallow streams;
- 3.20. Multi-channel data logger with integrated sensors: weather parameters;
- 3.21. Multi-channel data logger for external sensors: 4-20 mA (vented pressure transducer) and digital pulse (rainfall); Submersible with internal battery and internal GSM modem;
- 3.22. Multi-channel data logger for external sensors: multiple; with data transmission capabilities.

4. INTEGRATED DATA LOGGER WITH REMOVABLE WATER QUALITY SENSORS:

- 4.1. Multi-Parameter Water Quality Sonde with pH-, Electrical Conductivity-, Temperature-, Depth and Optical Oxygen Sensors (Bluetooth Communication Capability) – Diameter Less Than Five Centimetres;
- 4.2. Deep Water (Minimum 245m) Multi-Parameter Water Quality Sonde with Optical and Smart Sensor Technology - Diameter Less Than Five Centimetres;
- 4.3. Deep Water (Minimum 245m) Multi-Parameter Water Quality Sonde with Optical and Smart Sensor Technology - Diameter Less Than Nine Centimetres;

5. HANDHELD WATER QUALITY DEVICES

- 5.1. Multi-Parameter Handheld Water Quality System (with pH-, Dissolved Oxygen-, Electrical Conductivity- and Temperature Sensor)
- 5.2. Multi-parameter handheld water quality system (with pH-, dissolved oxygen-, electrical conductivity- and temperature sensor) with wireless smart device display capability

6. SENSORS

- 6.1. Sensor for Water Level Measurement: Shaft Encoder.
- 6.2. Sensor for Water Level Measurement: Pressure Transducer: Piezo resistive sensor (Stainless Steel) with 4-20mA output.
- 6.3. Sensor for Water Level Measurement: Pressure Transducer: Piezo resistive sensor (Ceramic) with 4-20mA output.
- 6.4. Sensor for Water Level Measurement: Pressure Transducer: Piezo resistive sensor (Stainless Steel) with SDI12 output.
- 6.5. Sensor for Water Level Measurement: Pressure Transducer: Piezo resistive sensor (Ceramic) with SDI12 output.
- 6.6. Sensor for Water Level Measurement: Bubbler:
- 6.7. Sensor for Water Level Measurement: Radar sensor with measuring range: 8 meter.
- 6.8. Sensor for Water Level Measurement: Radar sensor with measuring range: 15 meter.
- 6.9. Sensor for Water Level Measurement: Radar sensor with measuring range: 30 meter.
- 6.10. Sensor for Water Level Measurement: Contact Gauge.
- 6.11. Sensor for Water Level Measurement: Contact Gauge with temperature.

- 6.12. Sensor for Weather Measurement: Rain gauge, tipping bucket with integrated syphon mechanism (high levels of accuracy), powder coated aluminium only:
- 6.13. Sensor for Weather Measurement: Rain gauge, tipping bucket with integrated syphon mechanism (high levels of accuracy), powder coated aluminium/ ASA Polymer:
- 6.14. Sensor for Weather Measurement: Rain gauge, tipping bucket with integrated syphon mechanism (high levels of accuracy), for low rainfall events, powder coated aluminium/ ASA Polymer:
- 6.15. Sensor for Weather Measurement: Rain gauge, tipping bucket with integrated syphon mechanism (high levels of accuracy), ASA Polymer:
- 6.16. Sensor for Weather Measurement: Barometric Pressure:
- 6.17. Sensor for Weather Measurement: Humidity and Air Temperature
- 6.18. Sensor for Weather Measurement: Wind Direction Indicator
- 6.19. Sensor for Weather Measurement: Net Radiation

7. POWER SUPPLY EQUIPMENT

- 7.1. Battery, sealed, rechargeable, valve regulated lead-acid solar type, 12 Volt, 120 Ah capacity:
- 7.2. Battery, sealed, rechargeable, valve regulated lead-acid solar type, 12 Volt, 105 Ah capacity:
- 7.3. Battery, sealed, rechargeable, lead-acid solar type, 12 Volt, 40 Ah capacity:
- 7.4. Battery, sealed, rechargeable, lead-acid solar type, 12 Volt, 28 Ah capacity:
- 7.5. Battery, sealed, rechargeable, lead-acid solar type, 12 Volt, 12 Ah capacity:
- 7.6. Battery, sealed, rechargeable, lead-crystal solar type, 12 Volt, 28 Ah capacity:
- 7.7. Battery, size D, Lithium-thionyl chloride type, 3.6 Volt, 13 Ah capacity:
- 7.8. Battery, size D, Lithium-thionyl chloride type, 3.6 Volt, 13 Ah capacity with PCB connector,
- 7.9. Battery, size D, Lithium-thionyl chloride type, 3.6 Volt, 13 Ah capacity with ELP-02V connector:
- 7.10. Battery, size D, Lithium-thionyl chloride type, 3.6 Volt, 26 Ah capacity with ELP-02V connector:
- 7.11. Battery, size AA, Lithium-thionyl chloride type, 3.6 Volt,
- 7.12. Battery, size D, two cell, Lithium-thionyl chloride type, 3.9 Volt, 38 Ah capacity with ATX connector,
- 7.13. Battery, size A, Tadiran Lithium type, 3.9 Volt, 1.55 Ah capacity with tagged Hybrid Layer Capacitor polarised pins,
- 7.14. Battery, size C, Alkaline type, 1.5 Volt,
- 7.15. Battery, size AA, Alkaline type, 1.5 Volt,
- 7.16. Battery, size AAA, Alkaline type, 1.5 Volt,
- 7.17. Solar Panels:
- 7.18. Solar Charge Controller:
- 7.19. Power Control Unit or Mains Transformer:
- 7.20. Battery Charger:

SECTION 4: **DETAIL SPECIFICATIONS**

B. HANDHELD ACOUSTIC DOPPLER CURRENT METERS

1. **SCOPE:**
2. **HANDHELD ACOUSTIC DOPPLER INSTRUMENT 1:**
3. **HANDHELD ACOUSTIC DOPPLER INSTRUMENT 2:**

SECTION 4: **DETAIL SPECIFICATIONS**

C. ACOUSTIC DOPPLER CURRENT PROFILING SYSTEMS

1. **SCOPE:**
2. **ACOUSTIC DOPPLER CURRENT PROFILER 1;**
3. **ACOUSTIC DOPPLER CURRENT PROFILER 2;**
4. **ACOUSTIC DOPPLER CURRENT PROFILER 3.**
5. **ACOUSTIC DOPPLER CURRENT PROFILER 4.**

SECTION 4: DETAIL SPECIFICATIONS

D. VANDAL RESISTANT EQUIPMENT HOUSING;

1. SCOPE:

2. VANDAL RESISTANT EQUIPMENT HOUSING;

- 2.1 Custom size vandal resistant equipment hut door and frame with anti-tamper / anti-vandalism locking device:
- 2.2 Anti-Tamper / Anti-Vandalism equipment enclosures / cabinets in various sizes and with various mounting options:
- 2.3 Man-Hole cover door with Anti-Tamper / Anti-Vandalism locking device.
- 2.4 Gauge Box - Protection device for sensors with anti-tamper locking device:
- 2.5 Draw Box - Adjustable piping connector with multiple adjustable inlets and anti-tamper locking device.

SECTION 4: DETAIL SPECIFICATIONS

A. SURFACE- AND GROUNDWATER EQUIPMENT, SENSORS, APPLICATION SOFTWARE AND ACCESSORIES

1. SCOPE:

This section of the bid makes provision for the supply and delivery of surface- and groundwater equipment, sensors, application software and accessories for the Branch Planning and Information Management of the Department of Water and Sanitation. The equipment will be used to collect and transmit hydrological data from evaporation gauging stations, river gauging stations, dam gauging stations and boreholes, situated throughout the country, for transfer to HYDSTRA and other databases.

2. STAND-ALONE DATA LOGGING EQUIPMENT:

2.1. Single channel data logger:

a) Data Processing:

- Only intelligent data loggers, equipped with a microprocessor will be considered. ☐
- The data logger shall be equipped with a CPU watchdog circuit that will automatically restart the system in case of a severe electrical or electromagnetic disturbance.

b) Real time clock:

- The data loggers shall be equipped with battery backed hardware real time clock system. ☐
- The real time clock system shall provide time (24-hour system) and date information and shall make provision for leap years.
- The accuracy and stability of the real time clock shall be better than ± 30 seconds per month, operating under the environmental conditions listed above in SECTION 3: STANDARD SPECIFICATIONS.

c) Memory:

The data loggers shall be provided with the following types of memory systems: ☐

- Non-volatile memory for system and station parameters and user defined variables.
- Battery backed RAM for intermediate data storage and processing. (Minimum 128 KB) Stored data at 12 minute intervals more than 2 years if not downloaded.

d) Serial communication port:

- Each data logger shall preferably be equipped to allow bi-directional communication with outside equipment (laptop, tablet or smartphone) via one of the communication options: ☐

- 9-pin RS 232 serial port;
- Host- or Device USB interface;
- Infra-red interface;
- Bluetooth;
- Wireless;
- TCP / IP.

- The Communication module and power supply housing must be fixed at the non-submersible end of the logger.
- Communication and battery replacement should be possible without removing the logger from its installation.
- The communication module housing should have exchangeable desiccant cartridges that remove moisture ingress inside the housing.

e) Power supply:



- Each data logger shall be provided with an internal source that would prevent equipment shutdown or loss of data when the main battery is either disconnected for a short period or exchanged. (± 12 minutes)
- Power for all the sensors will be derived from the internal main battery via the data logger for more than 2 years at an interval of 12 minutes.
- The logger must have low power consumption on standby mode.
- Loggers with non-standard batteries that cannot be replaced by the operator must have a battery life of at least 5 years at an hourly logging interval under the specified operating temperatures.
- Loggers with batteries that can be replaced by the operator must have a battery life of at least 6 months at an hourly logging interval under the specified operating temperatures.
- The data logger must be reverse polarity protected.
- The logger must be programmable to log at a fixed rate or multiple logging intervals from 1 minute to 12 hours.

f) Input functions and interfacing:



- The data logger shall be designed to allow input of measurement for **one** channel - user definable on order between analogue and digital inputs.
- The analogue modules shall be designed to input either Pulse, 0 - 20 mA, 4 - 20 mA, 0 - 10 V, 1 - 10 V, -2.... +2V, 0....5V or 1....5V signals.
- The analogue input signals shall be measured to an overall accuracy of better than 0.5 to 0.1%. The input circuits shall be so designed that no errors will be introduced by ground loops.
- In order to conserve power, the data logger shall control the power supply to each sensor. Sensors shall be switched on in sequence and readings taken under processor control. Sufficient warm-up and stabilization time for sensors must be controlled by the logger.
- During non-measurement periods power supply to the sensors and signal converter

units shall be interrupted for all the analogue channels.

- Full calibration procedures shall be provided for each sensor / signal conditioning unit.
- Input connectors for sensors shall be clearly labelled, shall be polarized to prevent mismatching of connectors and shall be configured so that no damage can occur if a unit is accidentally or intentionally connected to the wrong input channel. Each connector shall make provision for all the necessary signal lines, earth, 0V and 12V (switched) supplied lines.
- The data logger will feature an optional integral pressure sensor for connection to the water pressure.

g) Enclosure and Housing:



- **Only** compact data loggers will be accepted, therefore all electronic components, wiring, etc., will be fixed / mounted inside the logger housing.
- The data logger shall be enclosed in wall mounted / standing enclosures, for installation in a recorder hut.
- The housing shall be manufactured of corrosion resistant material.
- The housing shall comply with at least IP64: Solid particle protection: Dust tight; and Liquid ingress protection: Splashing of water;
- Provision must be made in the housing to enable data transmission via external modem through a plug connector.
- The data logger / communication unit housing shall not exceed the following dimensions:
 - Height: less than 600 mm;
 - Width: less than 150 mm;
 - Depth: less than 150 mm.



h) Internal Software Requirements:

- All software packages shall be written and structured in a high level programming language. To conserve memory space, and thus power required, the use of a compiled program is recommended.
- The data logger operating software shall be located in ROM (EPROM) and the Bidder shall be responsible for the provision of all the software required for the data logger at no additional cost.
- The data logger SOFTWARE shall allow the equipment to operate in a completely unattended mode and all reasonable precautions shall be taken in the structuring of the error trapping routines to prevent system hang-up.
- In order to conserve power, the data logger shall control the power supply to each sensor. Sensors shall be switched on in sequence and readings taken under processor control. The logger must control sufficient warm-up and stabilisation time for sensors.
- During non-measurement periods power supply to the sensors and signal converter units shall be interrupted for all the analogue channels.

- When the data logger is switched on, it shall perform a self-test, checking that all required cards and devices are present and that all RAM is operational. If any fault is detected, it shall display the fault description on the display and halt operation. If no fault or error is detected, it shall resume operation, using the system information in RAM.

i) Data storage:

☐

- Data records shall contain the following information:
 - ID no, Sensor/Channel no, Time/Date and measured value.
 - The measured value shall be given in engineering units.
- Data storage shall be done on a circulating storage system, first in - first out.
- The memory contents must be retained for two years in the case of a power supply breakdown.

j) Data display:

☐

- All conversation between the data logger and the operator shall be done via the display-unit or laptop, tablet or smart device.
- When connecting to the data logger, the following information should be displayed:
 - Measured values, Date, Time, Battery status.
- A time-out shall be provided, so that the display will go into a sleeping mode if no keyboard activity is detected for a period.
- The data logger display will indicate when it is busy with data transfer.

k) Surge Protection (Accessories):

☐

- The Bidder shall make provision for and bid separately for surge protection equipment on all system input/output circuits and power supply input (DC, mains) circuits.
- The following equipment shall be included as an absolute minimum requirement:
 - On all analog /digital input and output circuits – DEHN BLITZDUCTORS TYPE LZ or equivalent with appropriate voltage ratings.
 - On all mains power supply circuits - DEHN type VA-280 surge arrestors or equivalent.
 - The Department may allow the use of alternative types of surge arrestors, provided that equivalent or superior protection levels will be achieved. SABS and/or CSIR test reports to substantiate claims shall be provided for the alternative offers.
 - It is not anticipated that the stated equipment will be used on its own, necessarily, provide the required level of protection and the Bidder shall implement additional measures deemed necessary to achieve the required protection level.

l) Data acquisition:

☐

- The data logger shall operate with a fixed interval logging sequences.
- The operating system should allow for various measurement intervals. The

operators shall however be able to select a fixed interval for sample and storing of the data:

- Minimum sampling time of 60 seconds.
- For each input channel the data logger shall provide a scaling factor and offset so that the measured value can be adjusted to the actual reading. For the water level channels, the scaling factor will be determined by the transducer selected. This will allow for the transducer being placed above or below the zero thresholds.

2.2. Multi-channel data logger;

a) Data Processing:

☐

- Only intelligent data loggers, equipped with a microprocessor will be considered.
- The data logger shall be equipped with a CPU watchdog circuit that will automatically restart the system in case of a severe electrical or electromagnetic disturbance.

b) Real time clock:

☐

- The data loggers shall be equipped with battery backed hardware real time clock system.
- The real time clock system shall provide time (24-hour system) and date information and shall make provision for leap years.
- The accuracy and stability of the real time clock shall be better than ± 30 seconds per month, operating under the environmental conditions listed above in SECTION 3: STANDARD SPECIFICATIONS.

c) Memory:

☐

The data loggers shall be provided with the following types of memory systems:

- Non-volatile memory for system and station parameters and user defined variables.
- Battery backed RAM for intermediate data storage and processing. (Minimum 128 KB) Stored data at 12 minute intervals more than 2 years if not downloaded.

d) Serial communication port:

- Each data logger shall preferably be equipped to allow bi-directional communication with outside equipment (laptop, tablet or smartphone) via one of the communication options:

☐

- 9-pin RS 232 serial port;
- Host- or Device USB interface;
- Infra-red interface;
- Bluetooth;
- Wireless;
- TCP / IP.

- The Communication module and power supply housing must be fixed at the non-submersible end of the logger.
- Communication and battery replacement should be possible without removing the logger from its installation.
- The communication module housing should have exchangeable desiccant cartridges that remove moisture ingress inside the housing.

e) Power supply:

☐

- Each data logger shall be provided with an internal source that would

prevent equipment shutdown or loss of data when the main battery is either disconnected for a short period or exchanged. (± 12 minutes)

- Power for all the sensors will be derived from the internal main battery via the data logger for more than 2 years at an interval of 12 minutes.
- The logger must have low power consumption on standby mode.
- Loggers with non-standard batteries that cannot be replaced by the operator must have a battery life of at least 5 years at an hourly logging interval under the specified operating temperatures.
- Loggers with batteries that can be replaced by the operator must have a battery life of at least 6 months at an hourly logging interval under the specified operating temperatures.
- The data logger must be reverse polarity protected.
- The logger must be programmable to log at a fixed rate or multiple logging intervals from 1 minute to 12 hours.

f) Input functions and interfacing:



- The data logger shall be designed to allow input of measurement for **more than one** channel - user definable on order between analogue and digital inputs.
- The analogue modules shall be designed to input either Pulse, 0 - 20 mA, 4 - 20 mA, 0 - 10 V, 1 - 10 V, -2.... +2V, 0....5V or 1....5V signals.
- The analogue input signals shall be measured to an overall accuracy of better than 0.5 to 0.1%. The input circuits shall be so designed that no errors will be introduced by ground loops.
- In order to conserve power, the data logger shall control the power supply to each sensor. Sensors shall be switched on in sequence and readings taken under processor control. Sufficient warm-up and stabilization time for sensors must be controlled by the logger.
- During non-measurement periods power supply to the sensors and signal converter units shall be interrupted for all the analogue channels.
- Full calibration procedures shall be provided for each sensor / signal conditioning unit.
- Input connectors for sensors shall be clearly labelled, shall be polarized to prevent mismatching of connectors and shall be configured so that no damage can occur if a unit is accidentally or intentionally connected to the wrong input channel. Each connector shall make provision for all the necessary signal lines, earth, 0V and 12V (switched) supplied lines.
- The data logger will feature an optional integral pressure sensor for connection to the water pressure.

g) Enclosure and Housing:



- **Only** compact data loggers will be accepted, therefore all electronic components, wiring, etc., will be fixed / mounted inside the logger housing.
- The data logger shall be enclosed in wall mounted / standing enclosures, for

installation in a recorder hut.

- The housing shall be manufactured of corrosion resistant material.
- The housing shall comply with at least IP64: Solid particle protection: Dust tight; and Liquid ingress protection: Splashing of water; ☐
- Provision must be made in the housing to enable data transmission via external modem through a plug connector.
- The data logger / communication unit housing shall not exceed the following dimensions:
 - Height: less than 600 mm;
 - Width: less than 150 mm;
 - Depth: less than 150 mm.

h) Internal Software Requirements:

- All software packages shall be written and structured in a high level programming language. To conserve memory space, and thus power required, the use of a compiled program is recommended.
- The data logger operating software shall be located in ROM (EPROM) and the Bidder shall be responsible for the provision of all the software required for the data logger at no additional cost.
- The data logger SOFTWARE shall allow the equipment to operate in a completely unattended mode and all reasonable precautions shall be taken in the structuring of the error trapping routines to prevent system hang-up.
- In order to conserve power, the data logger shall control the power supply to each sensor. Sensors shall be switched on in sequence and readings taken under processor control. The logger must control sufficient warm-up and stabilisation time for sensors.
- During non-measurement periods power supply to the sensors and signal converter units shall be interrupted for all the analogue channels.
- When the data logger is switched on, it shall perform a self-test, checking that all required cards and devices are present and that all RAM is operational. If any fault is detected, it shall display the fault description on the display and halt operation. If no fault or error is detected, it shall resume operation, using the system information in RAM.

i) Data storage:

- Data records shall contain the following information: ☐
 - ID no, Sensor/Channel no, Time/Date and measured value.
 - The measured value shall be given in engineering units.
- Data storage shall be done on a circulating storage system, first in - first out.
- The memory contents must be retained for two years in the case of a power supply breakdown.

j) Data display:

- All conversation between the data logger and the operator shall be done via ☐

the display-unit or laptop, tablet or smart device.

- When connecting to the data logger, the following information should be displayed:
 - Measured values, Date, Time, Battery status.
- A time-out shall be provided, so that the display will go into a sleeping mode if no keyboard activity is detected for a period.
- The data logger display will indicate when it is busy with data transfer.

k) Surge Protection (Accessories):

☐

- The Bidder shall make provision for and bid separately for surge protection equipment on all system input/output circuits and power supply input (DC, mains) circuits.
- The following equipment shall be included as an absolute minimum requirement:
 - On all analog /digital input and output circuits – DEHN BLITZDUCTORS TYPE LZ or equivalent with appropriate voltage ratings.
 - On all mains power supply circuits - DEHN type VA-280 surge arrestors or equivalent.
 - The Department may allow the use of alternative types of surge arrestors, provided that equivalent or superior protection levels will be achieved. SABS and/or CSIR test reports to substantiate claims shall be provided for the alternative offers.
 - It is not anticipated that the stated equipment will be used on its own, necessarily, provide the required level of protection and the Bidder shall implement additional measures deemed necessary to achieve the required protection level.

l) Data acquisition:

☐

- The data logger shall operate with a fixed interval logging sequences.
- The operating system should allow for various measurement intervals. The operators shall however be able to select a fixed interval for sample and storing of the data:
 - Minimum sampling time of 60 seconds.
- For each input channel the data logger shall provide a scaling factor and offset so that the measured value can be adjusted to the actual reading. For the water level channels, the scaling factor will be determined by the transducer selected. This will allow for the transducer being placed above or below the zero thresholds.

3. INTEGRATED DATA LOGGER WITH INTEGRATED SENSORS:

3.1. Single channel data logger with integrated sensor: shaft encoder;

3.1.1 Single channel data logger:

a) Data Processing:

☐

- Only intelligent data loggers, equipped with a microprocessor will be considered.
 - The data logger shall be equipped with a CPU watchdog circuit that will automatically restart the system in case of a severe electrical or electromagnetic disturbance.
- b) Real time clock: ☐
- The data loggers shall be equipped with battery backed hardware real time clock system.
 - The real time clock system shall provide time (24-hour system) and date information and shall make provision for leap years.
 - The accuracy and stability of the real time clock shall be better than ± 30 seconds per month, operating under the environmental conditions listed above in SECTION 3: STANDARD SPECIFICATIONS.
- c) Memory: ☐
- The data loggers shall be provided with the following types of memory systems:
- Non-volatile memory for system and station parameters and user defined variables.
 - Battery backed RAM for intermediate data storage and processing. (Minimum 128 KB) Stored data at 12 minutes interval more than 2 years if not downloaded.
- d) Power supply: ☐
- Each data logger shall be provided with an internal source that would prevent equipment shutdown or loss of data when the main battery is either disconnected for a short period or exchanged. (± 12 minutes)
 - Power for all the sensors will be derived from the internal main battery via the data logger for more than 2 years at an interval of 12 minutes.
 - The logger must have low power consumption on standby mode.
 - Loggers with non-standard batteries that cannot be replaced by the operator must have a battery life of at least 5 years at an hourly logging interval under the specified operating temperatures.
 - Loggers with batteries that can be replaced by the operator must have a battery life of at least 6 months at an hourly logging interval under the specified operating temperatures.
 - The data logger must be reverse polarity protected.
 - The logger must be programmable to log at a fixed rate or multiple logging intervals from 1 minute to 12 hours.
- e) Input functions and interfacing: ☐
- The analogue input signals shall be measured to an overall accuracy of better than 0.5 to 0.1%. The input circuits shall be so designed that no errors will be introduced by ground loops.
 - In order to conserve power, the data logger shall control the power supply to each sensor. Sensors shall be switched on in sequence and readings taken under processor control. Sufficient warm-up and stabilization time for sensors must be

controlled by the logger.

- During non-measurement periods power supply to the sensors and signal converter units shall be interrupted for all the analogue channels.
- Full calibration procedures shall be provided for each sensor / signal conditioning unit.
- Input connectors for sensors shall be clearly labelled, shall be polarized to prevent mismatching of connectors and shall be configured so that no damage can occur if a unit is accidentally or intentionally connected to the wrong input channel. Each connector shall make provision for all the necessary signal lines, earth, 0V and 12V (switched) supplied lines.
- The data logger will feature an optional integral pressure sensor for connection to the water pressure.

f) Enclosure and Housing:



- **Only** compact data loggers will be accepted, therefore all electronic components, wiring, etc., will be fixed / mounted inside the logger housing. **No** logger will be considered should the operator need to open the housing to access the keypad, LC Display, Connectors, etc.
- The data logger shall be enclosed in wall mounted / standing enclosures, for installation in a recorder hut.
- The housing shall be manufactured of corrosion resistant material.
- The data logger / communication unit housing shall not exceed the following dimensions:
 - Height: less than 600 mm;
 - Width: less than 150 mm;
 - Depth: less than 150 mm.

g) Internal Software Requirements:

- General:
 - All software packages shall be written and structured in a high level programming language. To conserve memory space, and thus power required, the use of a compiled program is recommended.
 - The data logger operating software shall be located in ROM (EEPROM) and the Bidder shall be responsible for the provision of all the software required for the data logger at no additional cost.
 - The data logger SOFTWARE shall allow the equipment to operate in a completely unattended mode and all reasonable precautions shall be taken in the structuring of the error trapping routines to prevent system hang-up.
 - In order to conserve power, the data logger shall control the power supply to each sensor. Sensors shall be switched on in sequence and readings taken under processor control. The logger must control sufficient warm-up and stabilisation time for sensors.
 - During non-measurement periods power supply to the sensors and signal converter units shall be interrupted for all the analogue

channels.

h) Data storage:

☐

- Data records shall contain the following information:
 - ID no, Sensor/Channel no, Time/Date and measured value.
 - The measured value shall be given in engineering units.
- Data storage shall be done on a circulating storage system, first in - first out.
- The memory contents must be retained for two years in the case of a power supply breakdown.

i) Data display:

☐

- All conversation between the data logger and the operator shall be done via the display-unit or laptop, tablet or smart device.
- When connecting to the data logger, the following information should be displayed:
 - Measured values, Date, Time, Battery status.
- A time-out shall be provided, so that the display will go into a sleeping mode if no keyboard activity is detected for a period.
- The data logger display will indicate when it is busy with data transfer.

j) Surge Protection (Accessories):

☐

- The Bidder shall make provision for and bid separately for surge protection equipment on all system input/output circuits and power supply input (dc, mains) circuits.
- The following equipment shall be included as an absolute minimum requirement:
 - On all analog /digital input and output circuits – DEHN BLITZDUCTORS TYPE LZ or equivalent with appropriate voltage ratings.
 - On all mains power supply circuits - DEHN type VA-280 surge arrestors or equivalent.
 - The Department may allow the use of alternative types of surge arrestors, provided that equivalent or superior protection levels will be achieved. SABS and/or CSIR test reports to substantiate claims shall be provided for the alternative offers.
 - It is not anticipated that the stated equipment will be used on its own, necessarily, provide the required level of protection and the Bidder shall implement additional measures deemed necessary to achieve the required protection level.

k) Data acquisition:

☐

- The data logger shall operate with a fixed interval logging sequences.
- The operating system should allow for various measurement intervals. The operators shall however be able to select a fixed interval for sample and storing of the data:
 - Minimum sampling time of 60 seconds.

3.1.2 Shaft encoder:



a) Application:

The shaft encoder will operate with a float and counterweight system.

- The shaft encoder must preferably have a standard resolution of 1 mm and must preferably be capable of measuring water levels from 0 - 19,999 m (mm resolution) and 0-199,99 m (cm resolution). Desired resolution must be able to be scaled by the user.

b) Design and technical details:



- The shaft encoder must be compact, robust and corrosion-resistant.
- The shaft encoder unit must be connected to the data logger with a flexible cable.
- The sense of rotation must be able to be selected by the user for left- or right hand rising.
- The shaft encoder must be able to process an extremely high rotation speed. At least 1m rise or fall in 20 seconds, or better.
- The pulley of the shaft encoder must be able to accommodate 1 mm Ø float cable.
- The float cable must not slip on the encoder pulley.
- A corrosion-resistant bracket for stand-alone operation must be available.

3.2. Single channel data logger with integrated sensor: pressure transducer (vented);

3.2.1. Single channel data logger:

a) Data Processing: ☐

- Only intelligent data loggers, equipped with a microprocessor will be considered.
- The data logger shall be equipped with a CPU watchdog circuit that will automatically restart the system in case of a severe electrical or electromagnetic disturbance.

b) Real time clock: ☐

- The data loggers shall be equipped with battery backed hardware real time clock system.
- The real time clock system shall provide time (24-hour system) and date information and shall make provision for leap years.
- The accuracy and stability of the real time clock shall be better than ± 30 seconds per month, operating under the environmental conditions listed above in SECTION 3: STANDARD SPECIFICATIONS.

c) Memory: ☐

The data loggers shall be provided with the following types of memory systems:

- Non-volatile memory for system and station parameters and user defined variables.
- Battery backed RAM for intermediate data storage and processing. (Minimum 128 KB) Stored data at 12 minutes interval more than 2 years if not downloaded.

d) Power supply: ☐

- Each data logger shall be provided with an internal source that would prevent equipment shutdown or loss of data when the main battery is either disconnected for a short period or exchanged. (± 12 minutes)
- Power for all the sensors will be derived from the internal main battery via the data logger for more than 2 years at an interval of 12 minutes.
- The logger must have low power consumption on standby mode.
- Loggers with non-standard batteries that cannot be replaced by the operator must have a battery life of at least 5 years at an hourly logging interval under the specified operating temperatures.
- Loggers with batteries that can be replaced by the operator must have a battery life of at least 6 months at an hourly logging interval under the specified operating temperatures.
- The data logger must be reverse polarity protected.
- The logger must be programmable to log at a fixed rate or multiple logging intervals from 1 minute to 12 hours.

e) Input functions and interfacing: ☐

- The analogue input signals shall be measured to an overall accuracy of better than 0.5 to 0.1%. The input circuits shall be so designed that no errors will be introduced by ground loops.
- In order to conserve power, the data logger shall control the power supply to each sensor. Sensors shall be switched on in sequence and readings taken under processor control. Sufficient warm-up and stabilization time for sensors must be controlled by the logger.
- During non-measurement periods power supply to the sensors and signal converter units shall be interrupted for all the analogue channels.
- Full calibration procedures shall be provided for each sensor / signal conditioning unit.
- Input connectors for sensors shall be clearly labelled, shall be polarized to prevent mismatching of connectors and shall be configured so that no damage can occur if a unit is accidentally or intentionally connected to the wrong input channel. Each connector shall make provision for all the necessary signal lines, earth, 0V and 12V (switched) supplied lines.
- The data logger will feature an optional integral pressure sensor for connection to the water pressure.

f) Enclosure and Housing:



- **Only** compact data loggers will be accepted, therefore all electronic components, wiring, etc., will be fixed / mounted inside the logger housing. **No** logger will be considered should the operator need to open the housing to access the keypad, LC Display, Connectors, etc.
- The data logger shall be enclosed in wall mounted / standing enclosures, for installation in a recorder hut.
- The housing shall be manufactured of corrosion resistant material.
- The data logger / communication unit housing shall not exceed the following dimensions:
 - Height: less than 600 mm;
 - Width: less than 150 mm;
 - Depth: less than 150 mm.

g) Internal Software Requirements:

- All software packages shall be written and structured in a high level programming language. To conserve memory space, and thus power required, the use of a compiled program is recommended.
- The data logger operating software shall be located in ROM (EEPROM) and the Bidder shall be responsible for the provision of all the software required for the data logger at no additional cost.
- The data logger SOFTWARE shall allow the equipment to operate in a completely unattended mode and all reasonable precautions shall be taken in the structuring of the error trapping routines to prevent system hang-up.
- In order to conserve power, the data logger shall control the power supply to each sensor. Sensors shall be switched on in sequence and readings taken under

processor control. The logger must control sufficient warm-up and stabilisation time for sensors.

- During non-measurement periods power supply to the sensors and signal converter units shall be interrupted for all the analogue channels.

h) Data storage:

- Data records shall contain the following information: ☐
 - ID no, Sensor/Channel no, Time/Date and measured value.
 - The measured value shall be given in engineering units.
- Data storage shall be done on a circulating storage system, first in - first out.
- The memory contents must be retained for two years in the case of a power supply breakdown.

i) Data display:

- All conversation between the data logger and the operator shall be done via the display-unit or laptop, tablet or smart device. ☐
- When connecting to the data logger, the following information should be displayed:
 - Measured values, Date, Time, Battery status.
- A time-out shall be provided, so that the display will go into a sleeping mode if no keyboard activity is detected for a period.
- The data logger display will indicate when it is busy with data transfer.

j) Surge Protection (Accessories):

- The Bidder shall make provision for and bid separately for surge protection equipment on all system input/output circuits and power supply input (dc, mains) circuits. ☐
- The following equipment shall be included as an absolute minimum requirement:
 - On all analog /digital input and output circuits – DEHN BLITZDUCTORS TYPE LZ or equivalent with appropriate voltage ratings.
 - On all mains power supply circuits - DEHN type VA-280 surge arrestors or equivalent.
 - The Department may allow the use of alternative types of surge arrestors, provided that equivalent or superior protection levels will be achieved. SABS and/or CSIR test reports to substantiate claims shall be provided for the alternative offers.
 - It is not anticipated that the stated equipment will be used on its own, necessarily, provide the required level of protection and the Bidder shall implement additional measures deemed necessary to achieve the required protection level.

k) Data acquisition:

- The data logger shall operate with a fixed interval logging sequences. ☐
- The operating system should allow for various measurement intervals. The

operators shall however be able to select a fixed interval for sample and storing of the data:

- Minimum sampling time of 60 seconds.

3.2.2. Pressure Transducer:



3.2.2.1. Application:

- a) The submersible pressure transducer will be used for hydrostatic water level measurement and will be measuring pressure using a vented cable.
- b) Pressure transducers must be capable of measuring water levels from 0 - 100 m, the range of each transducer being determined by the Department and pre-set in the factory. Typical ranges could be: 0 - 1 m; 0 – 2.5 m; 0 - 5 m; 0 – 10 m; 0 – 20 m, 0 – 30 m and >40 m on request.
- c) The pressure transducers must have a high reliability and ensure a large range of application for pressure measurement in all fields of water level measurement.

3.2.2.2. Design and technical details:

a) Pressure Transducer housing:

- The housing must be in an all-sealed enclosure and the pressure port must be vented to the atmosphere using a vented cable.
- The transducer housing must be robust, corrosion-resistant, insensitive to impact and vibration and watertight up to at least 70 m of water column. (>70 m on request).
- The opening to the sensor must be protected by a removable threaded cap to allow for maintenance.
- The transducer housing shall preferably not exceed the following dimensions and weight:
 - Length: 500 mm
 - Diameter: 50 mm
 - Weight: 1 kg
 -
- The transducer housing can be fitted with a watertight plug for connection to the transducer cable.

b) Pressure sensor:

- The submersible pressure transducer sensor must be based on a piezo resistive ceramic or fully welded piezo resistive stainless steel pressure sensor element.
- The measuring cell must be chemically and thermally resistant.
- The pressure sensor must have a compensated operating temperature range of - 5°C to +70°C.
- The sensor should be calibrated; temperatures compensated and provide amplified analogue output signals for 4-20mA output.
- The sensor should have a supply voltage of between 9 to 32V and must have reverse polarity protection.
- The sensor must have a response time of maximum 35ms with a power consumption not exceeding 250mW. Typical sensor warm-up time must not exceed

2 seconds.

- The sensor proof pressure must be two times the rated pressure range. Proof pressure is the maximum pressure which may be applied without causing damage to the sensing element.
- The pressure sensor must have surge immunity according to EN 61000-4-5 for current output devices with cable lengths longer than 10m.

c) Measuring Accuracy of the Pressure Transducer Sensor:

- The sensor's Non-linearity (Best Straight Line fit), hysteresis (maximum output difference at any point within the operating pressure range for increasing and decreasing pressure) and repeatability must be 0.1 % FSO (Full Scale).

d) Vented Transducer cable:

- The vented cable is factory fitted to the submersible pressure transducer housing and the length of cable for each submersible pressure transducer are being determined by the Department during procurement.
- The pressure transducer and transducer cable shall be designed to function satisfactorily with a cable length of up to 250 m.
- Flexible with Polyurethane jacketing material for corrosive media and maximum outer diameter 12 mm.
- Double sheathing with interposed tinned copper- braiding shielding with polyester with polyester film to cover the vented tube and all connectors.
- There must be filler between the conductors and vent tube and all conductors must be of tin copper.
- As the transducer cable shall be used as the carrying rope, it shall preferably feature, for longitudinal stability, an internal Kevlar core assembly, or equivalent.
- A polyamide pressure-compensation capillary tube for measuring the reference pressure, with an inside diameter of preferably 3 mm, but not less than 1,0 mm.
- End of cable connected by terminal box with hydrophobic filters and exchangeable humidity absorber.
- A fixing clamp for exact positioning of the pressure probe in a stilling well or tube must be available, manufactured of non-corrosive material.

3.3. Single channel data logger with integrated sensor: barometric pressure;

3.3.1. Single channel data logger:

a) Data Processing: ☐

- Only intelligent data loggers, equipped with a microprocessor will be considered.
- The data logger shall be equipped with a CPU watchdog circuit that will automatically restart the system in case of a severe electrical or electromagnetic disturbance.

b) Real time clock: ☐

- The data loggers shall be equipped with battery backed hardware real time clock system.
- The real time clock system shall provide time (24-hour system) and date information and shall make provision for leap years.
- The accuracy and stability of the real time clock shall be better than ± 30 seconds per month, operating under the environmental conditions listed above in SECTION 3: STANDARD SPECIFICATIONS.

c) Memory: ☐

The data loggers shall be provided with the following types of memory systems:

- Non-volatile memory for system and station parameters and user defined variables.
- Battery backed RAM for intermediate data storage and processing. (Minimum 128 KB) Stored data at 12 minute intervals more than 2 years if not downloaded.

d) Power supply: ☐

- Each data logger shall be provided with an internal source that would prevent equipment shutdown or loss of data when the main battery is either disconnected for a short period or exchanged. (± 12 minutes)
- Power for all the sensors will be derived from the internal main battery via the data logger for more than 2 years at an interval of 12 minutes.
- The logger must have low power consumption on standby mode.
- Loggers with non-standard batteries that cannot be replaced by the operator must have a battery life of at least 5 years at an hourly logging interval under the specified operating temperatures.
- Loggers with batteries that can be replaced by the operator must have a battery life of at least 6 months at an hourly logging interval under the specified operating temperatures.
- The data logger must be reverse polarity protected.
- The logger must be programmable to log at a fixed rate or multiple logging intervals from 1 minute to 12 hours.

e) Input functions and interfacing: ☐

- The analogue input signals shall be measured to an overall accuracy of better than 0.5 to 0.1%. The input circuits shall be so designed that no errors will be introduced by ground loops.
- In order to conserve power, the data logger shall control the power supply to each sensor. Sensors shall be switched on in sequence and readings taken under processor control. Sufficient warm-up and stabilization time for sensors must be controlled by the logger.
- During non-measurement periods power supply to the sensors and signal converter units shall be interrupted for all the analogue channels.
- Full calibration procedures shall be provided for each sensor / signal conditioning unit.
- Input connectors for sensors shall be clearly labelled, shall be polarized to prevent mismatching of connectors and shall be configured so that no damage can occur if a unit is accidentally or intentionally connected to the wrong input channel. Each connector shall make provision for all the necessary signal lines, earth, 0V and 12V (switched) supplied lines.

f) Enclosure and Housing:



- **Only** compact data loggers will be accepted, therefore all electronic components, wiring, etc., will be fixed / mounted inside the logger housing. **No** logger will be considered should the operator need to open the housing to access the keypad, LC Display, Connectors, etc.
- The data logger shall be enclosed in wall mounted / standing enclosures, for installation in a recorder hut.
- The housing shall be manufactured of corrosion resistant material.
- The data logger / communication unit housing shall not exceed the following dimensions:

| | |
|-----------|-------------------|
| - Height: | less than 600 mm; |
| - Width: | less than 150 mm; |
| - Depth: | less than 150 mm. |

g) Internal Software Requirements:

- All software packages shall be written and structured in a high level programming language. To conserve memory space, and thus power required, the use of a compiled program is recommended.
- The data logger operating software shall be located in ROM (EPROM) and the Bidder shall be responsible for the provision of all the software required for the data logger at no additional cost.
- The data logger SOFTWARE shall allow the equipment to operate in a completely unattended mode and all reasonable precautions shall be taken in the structuring of the error trapping routines to prevent system hang-up.
- In order to conserve power, the data logger shall control the power supply to each sensor. Sensors shall be switched on in sequence and readings taken under processor control. The logger must control sufficient warm-up and stabilisation time for sensors.

- During non-measurement periods power supply to the sensors and signal converter units shall be interrupted for all the analogue channels.

h) Data storage:

- Data records shall contain the following information: ☐
 - ID no, Sensor/Channel no, Time/Date and measured value.
 - The measured value shall be given in engineering units.
- Data storage shall be done on a circulating storage system, first in - first out.
- The memory contents must be retained for two years in the case of a power supply breakdown.

i) Data display:

- All conversation between the data logger and the operator shall be done via the display-unit or laptop, tablet or smart device. ☐
- The data logger display will indicate when it is busy with data transfer.

j) Surge Protection (Accessories):

- The Bidder shall make provision for and bid separately for surge protection equipment on all system input/output circuits and power supply input (dc, mains) circuits. ☐
- The following equipment shall be included as an absolute minimum requirement:
 - On all analog /digital input and output circuits – DEHN BLITZDUCTORS TYPE LZ or equivalent with appropriate voltage ratings.
 - On all mains power supply circuits - DEHN type VA-280 surge arrestors or equivalent.
 - The Department may allow the use of alternative types of surge arrestors, provided that equivalent or superior protection levels will be achieved. SABS and/or CSIR test reports to substantiate claims shall be provided for the alternative offers.
 - It is not anticipated that the stated equipment will be used on its own, necessarily, provide the required level of protection and the Bidder shall implement additional measures deemed necessary to achieve the required protection level.

k) Data acquisition:

- The data logger shall operate with a fixed interval logging sequences. ☐
- The operating system should allow for various measurement intervals. The operators shall however be able to select a fixed interval for sample and storing of the data:
 - Minimum sampling time of 60 seconds.

3.3.2. Pressure Transducer:

3.3.2.1. Application:

- The pressure measurement must preferably operate, using the barometric pressure ☐

method.

3.3.2.2. Design and technical details:

- Resolution: 0.1mm hPa
- Range: 600 to 1060 hPa
- Accuracy: 0.8 mm hPa

3.4. Multi-channel data logger with integrated sensors: pressure transducer (vented) and temperature sensor;

3.4.1. Multi-channel data logger:

a) Data Processing: ☐

- Only intelligent data loggers, equipped with a microprocessor will be considered.
- The data logger shall be equipped with a CPU watchdog circuit that will automatically restart the system in case of a severe electrical or electromagnetic disturbance.

b) Real time clock: ☐

- The data loggers shall be equipped with battery backed hardware real time clock system.
- The real time clock system shall provide time (24-hour system) and date information and shall make provision for leap years.
- The accuracy and stability of the real time clock shall be better than ± 30 seconds per month, operating under the environmental conditions listed above in SECTION 3: STANDARD SPECIFICATIONS.

c) Memory: ☐

The data loggers shall be provided with the following types of memory systems:

- Non-volatile memory for system and station parameters and user defined variables.
- Battery backed RAM for intermediate data storage and processing. (Minimum 128 KB) Stored data at 12 minute intervals more than 2 years if not downloaded.

d) Power supply: ☐

- Each data logger shall be provided with an internal source that would prevent equipment shutdown or loss of data when the main battery is either disconnected for a short period or exchanged. (± 12 minutes)
- Power for all the sensors will be derived from the internal main battery via the data logger for more than 2 years at an interval of 12 minutes.
- The logger must have low power consumption on standby mode.
- Loggers with non-standard batteries that cannot be replaced by the operator must have a battery life of at least 5 years at an hourly logging interval under the specified operating temperatures.
- Loggers with batteries that can be replaced by the operator must have a battery life of at least 6 months at an hourly logging interval under the specified operating temperatures.
- The data logger must be reverse polarity protected.
- The logger must be programmable to log at a fixed rate or multiple logging intervals from 1 minute to 12 hours.

e) Input functions and interfacing: ☐

- The analogue input signals shall be measured to an overall accuracy of better than 0.5 to 0.1%. The input circuits shall be so designed that no errors will be introduced by ground loops.
- In order to conserve power, the data logger shall control the power supply to each sensor. Sensors shall be switched on in sequence and readings taken under processor control. Sufficient warm-up and stabilization time for sensors must be controlled by the logger.
- During non-measurement periods power supply to the sensors and signal converter units shall be interrupted for all the analogue channels.
- Full calibration procedures shall be provided for each sensor / signal conditioning unit.
- Input connectors for sensors shall be clearly labelled, shall be polarized to prevent mismatching of connectors and shall be configured so that no damage can occur if a unit is accidentally or intentionally connected to the wrong input channel. Each connector shall make provision for all the necessary signal lines, earth, 0V and 12V (switched) supplied lines.
- The data logger will feature an optional integral pressure sensor for connection to the water pressure.

f) Enclosure and Housing:



- **Only** compact data loggers will be accepted, therefore all electronic components, wiring, etc., will be fixed / mounted inside the logger housing. **No** logger will be considered should the operator need to open the housing to access the keypad, LC Display, Connectors, etc.
- The data logger shall be enclosed in wall mounted / standing enclosures, for installation in a recorder hut.
- The housing shall be manufactured of corrosion resistant material.
- The data logger / communication unit housing shall not exceed the following dimensions:
 - Height: less than 600 mm;
 - Width: less than 150 mm;
 - Depth: less than 150 mm.

g) Internal Software Requirements:

- All software packages shall be written and structured in a high level programming language. To conserve memory space, and thus power required, the use of a compiled program is recommended.
- The data logger operating software shall be located in ROM (EEPROM) and the Bidder shall be responsible for the provision of all the software required for the data logger at no additional cost.
- The data logger SOFTWARE shall allow the equipment to operate in a completely unattended mode and all reasonable precautions shall be taken in the structuring of the error trapping routines to prevent system hang-up.
- In order to conserve power, the data logger shall control the power supply to each sensor. Sensors shall be switched on in sequence and readings taken under

processor control. The logger must control sufficient warm-up and stabilisation time for sensors.

- During non-measurement periods power supply to the sensors and signal converter units shall be interrupted for all the analogue channels.

h) Data storage:

- Data records shall contain the following information: ☐
 - ID no, Sensor/Channel no, Time/Date and measured value.
 - The measured value shall be given in engineering units.
- Data storage shall be done on a circulating storage system, first in - first out.
- The memory contents must be retained for two years in the case of a power supply breakdown.

i) Data display:

- All conversation between the data logger and the operator shall be done via the display-unit or laptop, tablet or smart device. ☐
- When connecting to the data logger, the following information should be displayed:
 - Measured values, Date, Time, Battery status.
- A time-out shall be provided, so that the display will go into a sleeping mode if no keyboard activity is detected for a period.
- The data logger display will indicate when it is busy with data transfer.

j) Surge Protection (Accessories):

- The Bidder shall make provision for and bid separately for surge protection equipment on all system input/output circuits and power supply input (dc, mains) circuits. ☐
- The following equipment shall be included as an absolute minimum requirement:
 - On all analog /digital input and output circuits – DEHN BLITZDUCTORS TYPE LZ or equivalent with appropriate voltage ratings.
 - On all mains power supply circuits - DEHN type VA-280 surge arrestors or equivalent.
 - The Department may allow the use of alternative types of surge arrestors, provided that equivalent or superior protection levels will be achieved. SABS and/or CSIR test reports to substantiate claims shall be provided for the alternative offers.
 - It is not anticipated that the stated equipment will be used on its own, necessarily, provide the required level of protection and the Bidder shall implement additional measures deemed necessary to achieve the required protection level.

k) Data acquisition:

- The data logger shall operate with a fixed interval logging sequences. ☐
- The operating system should allow for various measurement intervals. The

operators shall however be able to select a fixed interval for sample and storing of the data:

- Minimum sampling time of 60 seconds.

3.4.2. Pressure Transducer:



3.4.2.1. Application:

- d) The submersible pressure transducer will be used for hydrostatic water level measurement and will be measuring pressure using a vented cable.
- e) Pressure transducers must be capable of measuring water levels from 0 - 100 m, the range of each transducer being determined by the Department and pre-set in the factory. Typical ranges could be: 0 - 1 m; 0 – 2.5 m; 0 - 5 m; 0 – 10 m; 0 – 20 m, 0 – 30 m and >40 m on request.
- f) The pressure transducers must have a high reliability and ensure a large range of application for pressure measurement in all fields of water level measurement.

3.4.2.2. Design and technical details:

e) Pressure Transducer housing:

- The housing must be in an all-sealed enclosure and the pressure port must be vented to the atmosphere using a vented cable.
- The transducer housing must be robust, corrosion-resistant, insensitive to impact and vibration and watertight up to at least 70 m of water column. (>70 m on request).
- The opening to the sensor must be protected by a removable threaded cap to allow for maintenance.
- The transducer housing shall preferably not exceed the following dimensions and weight:
 - Length: 500 mm
 - Diameter: 50 mm
 - Weight: 1 kg
 -
- The transducer housing can be fitted with a watertight plug for connection to the transducer cable.

f) Pressure sensor:

- The submersible pressure transducer sensor must be based on a piezo resistive ceramic or fully welded piezo resistive stainless steel pressure sensor element.
- The measuring cell must be chemically and thermally resistant.
- The pressure sensor must have a compensated operating temperature range of - 5°C to +70°C.
- The sensor should be calibrated, temperature compensated and provide amplified analogue output signals for 4-20mA output.
- The sensor should have a supply voltage of between 9 to 32V and must have reverse polarity protection.
- The sensor must have a response time of maximum 35ms with a power consumption not exceeding 250mW. Typical sensor warm-up time must not exceed

2 seconds.

- The sensor proof pressure must be two times the rated pressure range. Proof pressure is the maximum pressure which may be applied without causing damage to the sensing element.
- The pressure sensor must have surge immunity according to EN 61000-4-5 for current output devices with cable lengths longer than 10m.

g) Measuring Accuracy of the Pressure Transducer Sensor:

- The sensor's Non-linearity (Best Straight Line fit), hysteresis (maximum output difference at any point within the operating pressure range for increasing and decreasing pressure) and repeatability must be 0.1 % FSO (Full Scale).

h) Vented Transducer cable:

- The vented cable is factory fitted to the submersible pressure transducer housing and the length of cable for each submersible pressure transducer are being determined by the Department during procurement.
- The pressure transducer and transducer cable shall be designed to function satisfactorily with a cable length of up to 250 m.
- Flexible with Polyurethane jacketing material for corrosive media and maximum outer diameter 12 mm.
- Double sheathing with interposed tinned copper- braiding shielding with polyester with polyester film to cover the vented tube and all connectors.
- There must be filler between the conductors and vent tube and all conductors must be of tin copper.
- As the transducer cable shall be used as the carrying rope, it shall preferably feature, for longitudinal stability, an internal Kevlar core assembly, or equivalent.
- A polyamide pressure-compensation capillary tube for measuring the reference pressure, with an inside diameter of preferably 3 mm, but not less than 1,0 mm.
- End of cable connected by terminal box with hydrophobic filters and exchangeable humidity absorber.
- A fixing clamp for exact positioning of the pressure probe in a stilling well or tube must be available, manufactured of non-corrosive material.

3.4.3. Temperature sensor:

- The pressure transducer should preferably have an integrated temperature sensor, preferably of the platinum resistor type. The sensitivity of the measuring element shall be approximately 0,1 °C between a temperature range of at least -5°C to +40°C.

3.5. Multi-channel data logger with integrated sensors: pressure transducer (vented) and temperature sensor with integrated GSM modem;

3.5.1. Multi-channel data logger:

a) Data Processing: ☐

- Only intelligent data loggers, equipped with a microprocessor will be considered.
- The data logger shall be equipped with a CPU watchdog circuit that will automatically restart the system in case of a severe electrical or electromagnetic disturbance.

b) Real time clock: ☐

- The data loggers shall be equipped with battery backed hardware real time clock system.
- The real time clock system shall provide time (24-hour system) and date information and shall make provision for leap years.
- The accuracy and stability of the real time clock shall be better than ± 30 seconds per month, operating under the environmental conditions listed above in SECTION 3: STANDARD SPECIFICATIONS.

c) Memory: ☐

The data loggers shall be provided with the following types of memory systems:

- Non-volatile memory for system and station parameters and user defined variables.
- Battery backed RAM for intermediate data storage and processing. (Minimum 128 KB) Stored data at 12 minutes interval more than 2 years if not downloaded.

d) Power supply: ☐

- Each data logger shall be provided with an internal source that would prevent equipment shutdown or loss of data when the main battery is either disconnected for a short period or exchanged. (± 12 minutes)
- Power for all the sensors will be derived from the internal main battery via the data logger for more than 2 years at an interval of 12 minutes.
- The logger must have low power consumption on standby mode.
- Loggers with non-standard batteries that cannot be replaced by the operator must have a battery life of at least 5 years at an hourly logging interval under the specified operating temperatures.
- Loggers with batteries that can be replaced by the operator must have a battery life of at least 6 months at an hourly logging interval under the specified operating temperatures.
- The data logger must be reverse polarity protected.
- The logger must be programmable to log at a fixed rate or multiple logging intervals from 1 minute to 12 hours.

e) Input functions and interfacing: ☐

- The analogue input signals shall be measured to an overall accuracy of better than 0.5 to 0.1%. The input circuits shall be so designed that no errors will be introduced by ground loops.
- In order to conserve power, the data logger shall control the power supply to each sensor. Sensors shall be switched on in sequence and readings taken under processor control. Sufficient warm-up and stabilization time for sensors must be controlled by the logger.
- During non-measurement periods power supply to the sensors and signal converter units shall be interrupted for all the analogue channels.
- Full calibration procedures shall be provided for each sensor / signal conditioning unit.
- Input connectors for sensors shall be clearly labelled, shall be polarized to prevent mismatching of connectors and shall be configured so that no damage can occur if a unit is accidentally or intentionally connected to the wrong input channel. Each connector shall make provision for all the necessary signal lines, earth, 0V and 12V (switched) supplied lines.
- The data logger will feature an optional integral pressure sensor for connection to the water pressure.

f) Enclosure and Housing:



- **Only** compact data loggers will be accepted, therefore all electronic components, wiring, etc., will be fixed / mounted inside the logger housing. **No** logger will be considered should the operator need to open the housing to access the keypad, LC Display, Connectors, etc.
- The data logger shall be enclosed in wall mounted / standing enclosures, for installation in a recorder hut.
- The housing shall be manufactured of corrosion resistant material.
- The data logger / communication unit housing shall not exceed the following dimensions:
 - Height: less than 600 mm;
 - Width: less than 150 mm;
 - Depth: less than 150 mm.

g) Internal Software Requirements:

- All software packages shall be written and structured in a high level programming language. To conserve memory space, and thus power required, the use of a compiled program is recommended.
- The data logger operating software shall be located in ROM (EPROM) and the Bidder shall be responsible for the provision of all the software required for the data logger at no additional cost.
- The data logger SOFTWARE shall allow the equipment to operate in a completely unattended mode and all reasonable precautions shall be taken in the structuring of the error trapping routines to prevent system hang-up.
- In order to conserve power, the data logger shall control the power supply to each sensor. Sensors shall be switched on in sequence and readings taken under

processor control. The logger must control sufficient warm-up and stabilisation time for sensors.

- During non-measurement periods power supply to the sensors and signal converter units shall be interrupted for all the analogue channels.

h) Data storage:

- Data records shall contain the following information: ☐
 - ID no, Sensor/Channel no, Time/Date and measured value.
 - The measured value shall be given in engineering units.
- Data storage shall be done on a circulating storage system, first in - first out.
- The memory contents must be retained for two years in the case of a power supply breakdown.

i) Data display:

- All conversation between the data logger and the operator shall be done via the display-unit or laptop, tablet or smart device. ☐

j) Surge Protection (Accessories):

- The Bidder shall make provision for and bid separately for surge protection equipment on all system input/output circuits and power supply input (dc, mains) circuits. ☐
- The following equipment shall be included as an absolute minimum requirement:
 - On all analog /digital input and output circuits – DEHN BLITZDUCTORS TYPE LZ or equivalent with appropriate voltage ratings.
 - On all mains power supply circuits - DEHN type VA-280 surge arrestors or equivalent.
 - The Department may allow the use of alternative types of surge arrestors, provided that equivalent or superior protection levels will be achieved. SABS and/or CSIR test reports to substantiate claims shall be provided for the alternative offers.
 - It is not anticipated that the stated equipment will be used on its own, necessarily, provide the required level of protection and the Bidder shall implement additional measures deemed necessary to achieve the required protection level.

k) Data acquisition:

- The data logger shall operate with a fixed interval logging sequences. ☐
- The operating system should allow for various measurement intervals. The operators shall however be able to select a fixed interval for sample and storing of the data:
 - Minimum sampling time of 60 seconds.

3.5.2. Pressure Transducer:

3.5.2.1. Application:

☐

- a) The submersible pressure transducer will be used for hydrostatic water level measurement and will be measuring pressure using a vented cable.
- b) Pressure transducers must be capable of measuring water levels from 0 - 100 m, the range of each transducer being determined by the Department and pre-set in the factory. Typical ranges could be: 0 - 1 m; 0 – 2.5 m; 0 - 5 m; 0 – 10 m; 0 – 20 m, 0 – 30 m and >40 m on request.
- c) The pressure transducers must have a high reliability and ensure a large range of application for pressure measurement in all fields of water level measurement.

3.5.2.2. Design and technical details:

- a) Pressure Transducer housing:
 - The housing must be in an all-sealed enclosure and the pressure port must be vented to the atmosphere using a vented cable.
 - The transducer housing must be robust, corrosion-resistant, insensitive to impact and vibration and watertight up to at least 70 m of water column. (>70 m on request).
 - The opening to the sensor must be protected by a removable threaded cap to allow for maintenance.
 - The transducer housing shall preferably not exceed the following dimensions and weight:
 - Length: 500 mm
 - Diameter: 50 mm
 - Weight: 1 kg
 - The transducer housing can be fitted with a watertight plug for connection to the transducer cable.
- b) Pressure sensor:
 - The submersible pressure transducer sensor must be based on a piezo resistive ceramic or fully welded piezo resistive stainless steel pressure sensor element.
 - The measuring cell must be chemically and thermally resistant.
 - The pressure sensor must have a compensated operating temperature range of - 5°C to +70°C.
 - The sensor should be calibrated; temperature compensated and provide amplified analogue output signals for 4-20mA output.
 - The sensor should have a supply voltage of between 9 to 32V and must have reverse polarity protection.
 - The sensor must have a response time of maximum 35ms with a power consumption not exceeding 250mW. Typical sensor warm-up time must not exceed 2 seconds.
 - The sensor proof pressure must be two times the rated pressure range. Proof pressure is the maximum pressure which may be applied without causing damage to the sensing element.
 - The pressure sensor must have surge immunity according to EN 61000-4-5 for current output devices with cable lengths longer than 10m.

- c) Measuring Accuracy of the Pressure Transducer Sensor:
- The sensor's Non-linearity (Best Straight Line fit), hysteresis (maximum output difference at any point within the operating pressure range for increasing and decreasing pressure) and repeatability must be 0.1 % FSO (Full Scale).
- d) Vented Transducer cable:
- The vented cable is factory fitted to the submersible pressure transducer housing and the length of cable for each submersible pressure transducer are being determined by the Department during procurement.
 - The pressure transducer and transducer cable shall be designed to function satisfactorily with a cable length of up to 250 m.
 - Flexible with Polyurethane jacketing material for corrosive media and maximum outer diameter 12 mm.
 - Double sheathing with interposed tinned copper- braiding shielding with polyester with polyester film to cover the vented tube and all connectors.
 - There must be filler between the conductors and vent tube and all conductors must be of tin copper.
 - As the transducer cable shall be used as the carrying rope, it shall preferably feature, for longitudinal stability, an internal Kevlar core assembly, or equivalent.
 - A polyamide pressure-compensation capillary tube for measuring the reference pressure, with an inside diameter of preferably 3 mm, but not less than 1,0 mm.
 - End of cable connected by terminal box with hydrophobic filters and exchangeable humidity absorber.
 - A fixing clamp for exact positioning of the pressure probe in a stilling well or tube must be available, manufactured of non-corrosive material.

3.5.3. Temperature sensor:



- The transducer must include an integrated temperature sensor.
- Design and technical detail:
 - Platinum resistor type.
 - Measuring range: -5°C to +40°C.
 - Resolution: 0.02°C;
 - Accuracy: ± 0.15°C.

3.5.4. Transmission:



3.5.4.1. GSM Modem

- The data logger shall incorporate a GSM Modem for the purpose of transmitting and receiving data to and from the network. The GSM modem shall be type approved according to the applicable standards.

3.5.4.2. GSM Modem Frequency Band

- The GSM Modem shall be dual band and should be capable of operating at frequencies of 900 MHz/1800 MHz or 850 Hz/1900 MHz.

3.5.4.3. GSM Modem Antenna:

- The GSM antenna shall be integral to the data logger. The design of the antenna should be such that reliable operation in underground chambers with metal covers is possible and in deep basements, given a good signal level in the surrounding area of the chamber or basement.

3.5.4.4. Low Battery Detection and Reporting:

- It is an essential feature of the GSM data logger that the product remains in full compliance with the GSM specifications. When the power available from the battery of the data logger becomes insufficient for maintaining compliance, the modem operation must be prevented.
- It is therefore an imperative requirement that the data logger should feature a low battery detection system, which prevents GSM functionality when required.
- The data logger will transmit a low battery status along with the data as and when it occurs.

3.5.4.5. SIM Card Compatibility and Replacement:

- The data logger will permit the fitting and replacement of the SIM card by the user. It should support all current forms of SIM cards in common use by GSM operators.

3.5.4.6. Signal Strength Measurement:

- To carry out an installation, the installer will be required to measure the signal strength from the various operators with the product mounted in-situ. In the case of underground locations, this will involve placing the data logger in its anticipated position and measure signal strength with the chamber covers replaced, or in anticipated position in a basement.
- The data logger should therefore have a facility to carry out the unattended recording of signal strength. Subsequent downloading and analysis of the signal strength data then reveals the adequacy of the mounting position, the choice of provider and so on.

3.5.4.7. Choice of Operator:

- The data logger will operate with any of the GSM operators' networks.

3.5.4.8. Transmission of Data:

- The data logger will be programmed to initiate data transmission daily, weekly or monthly at a user selected time. The logger will assemble the data to be transmitted in the form of packets of suitable length and format to be transmitted as a number of SMS's.
- Data to be transmitted will be any data, which has not been previously sent, or, at the request of the data centre any data recorded from a particular date and time.
- The data logger will send its SMS's at the time selected, and await acknowledgment by the network that the messages have been received.
- In the event that the network rejects the SMS's or is not able to confirm their

receipt, the data logger will proceed through a retry algorithm.

- In the event that the retry algorithm fails, the data will be considered as not sent, and the data logger will record a communication error.
- The data logger will keep up to date a journal of all errors incurred in communication with the Modem and the GSM network including failure to register on the network, failure to send SMS, failure to read the SIM card, and so on.
- At the user's option, any new entry in the communication journal will be sent together with the data at data transmission time
- The format for the data sent in the form of SMS may be proprietary but should be 8-bit data coding scheme for maximum efficiency and include error checking so that any data corruption caused by the GSM network may be detected and removed.

3.5.4.9. Data Compression:

- The operating cost of the GSM data logger will be closely related to the amount of SMS's, which it will generate when transmitting data. It is an imperative requirement that an optimum method of data compression is implemented to minimize the number of SMS's sent for a given recording strategy. Manufacturers will demonstrate compliance to this clause by documenting their compression algorithm or by disclosing the number of SMS's required for given data logging configurations (i.e. 15-minute recording of one flow and one pressure channels).

3.5.4.10. Transmission of Alarms:

- In addition to sending data at a selected frequency and time, the data logger will also transmit information if alarm conditions occur.

3.5.4.11. Alarm Functionality

- For each channel, the alarm condition will be defined as any of the following events:
 - An input channel being found in an alarm condition
 - A state transition occurring from the signal being found in a normal transition to an alarm condition
 - A state transition occurring from the signal being found in an alarm condition to a normal condition
- For each channel, the user can select any combination of the above.
- An alarm is defined as:
 - The exceedance of a fixed threshold
 - The exceedance of a 24-hour profile
- A 24-hour profile is a set of consecutive values of the input stored in the data logger memory and selected by the user. The logger shall support up to two (high and low) profiles for each channel for week days and up to two profiles for each channel for Saturdays and Sundays.
- There shall be a facility to define a time window for each profile inside which the alarm thresholds or profiles shall apply.
- When an alarm event occurs, the data logger will carry out the following:

- Immediately attempt to send the alarm to the data centre (following the same procedure as for data)
- At the user's option, proceed to send new data at a user selectable interval for a user selectable time.

3.5.4.12. Hourly 2-way Communication, Remote Product Programming and Control:

- In normal operation the data logger shall receive SMS's transmitted to it at the time of data transmission. The SMS received by the data logger should permit remote programming and control. Features to be carried in this way should include as a minimum:
 - Changing the time and frequency of data transmission
 - Changing the destination of transmitted SMS
 - Accept request for SMS transmission of data, index, comms error journal
 - Change alarm settings
 - Change alarm threshold and profiles
- For advanced applications where more immediate 2-way communication and remote programming is required the data logger will be configured to register on the GSM network once every hour. This will allow the data logger to receive SMS transmitted from the user requesting one or more of the features listed above. The implementation of this feature should not affect the estimated battery life.

3.5.4.13. Data Poll Option:

- As standard, the GSM data logger as specified will operate in an inbound system when data is regularly sent from the data logger sites to a data collection centre.
- For certain applications, it may be required that the data is transmitted 'on-demand'. In these cases, the manufacturer will offer the data logging unit programmed to register on the GSM network once every hour. The user can then send an SMS to the unit requesting the latest data and receive the information within an hour.
- This system will have the advantage of only using SMS text messaging and will be much less susceptible to poor signal strength.

3.6. Multi-channel data logger with integrated sensors: pressure transducer (vented), temperature- and conductivity sensor with integrated GSM modem;

3.6.1. Multi-channel data logger:

a) Data Processing:

☐

- Only intelligent data loggers, equipped with a microprocessor will be considered.
- The data logger shall be equipped with a CPU watchdog circuit that will automatically restart the system in case of a severe electrical or electromagnetic disturbance.

b) Real time clock:

☐

- The data loggers shall be equipped with battery backed hardware real time clock system.
- The real time clock system shall provide time (24-hour system) and date information and shall make provision for leap years.
- The accuracy and stability of the real time clock shall be better than ± 30 seconds per month, operating under the environmental conditions listed above in SECTION 3: STANDARD SPECIFICATIONS.

c) Memory:

☐

The data loggers shall be provided with the following types of memory systems:

- Non-volatile memory for system and station parameters and user defined variables.
- Battery backed RAM for intermediate data storage and processing. (Minimum 128 KB) Stored data at 12 minute intervals more than 2 years if not downloaded.

d) Power supply:

☐

- Each data logger shall be provided with an internal source that would prevent equipment shutdown or loss of data when the main battery is either disconnected for a short period or exchanged. (± 12 minutes)
- Power for all the sensors will be derived from the internal main battery via the data logger for more than 2 years at an interval of 12 minutes.
- The logger must have low power consumption on standby mode.
- Loggers with non-standard batteries that cannot be replaced by the operator must have a battery life of at least 5 years at an hourly logging interval under the specified operating temperatures.
- Loggers with batteries that can be replaced by the operator must have a battery life of at least 6 months at an hourly logging interval under the specified operating temperatures.
- The data logger must be reverse polarity protected.
- The logger must be programmable to log at a fixed rate or multiple logging intervals from 1 minute to 12 hours.

e) Input functions and interfacing:

☐

- The analogue input signals shall be measured to an overall accuracy of better than 0.5 to 0.1%. The input circuits shall be so designed that no errors will be introduced by ground loops.
- In order to conserve power, the data logger shall control the power supply to each sensor. Sensors shall be switched on in sequence and readings taken under processor control. Sufficient warm-up and stabilization time for sensors must be controlled by the logger.
- During non-measurement periods power supply to the sensors and signal converter units shall be interrupted for all the analogue channels.
- Full calibration procedures shall be provided for each sensor / signal conditioning unit.
- Input connectors for sensors shall be clearly labelled, shall be polarized to prevent

mismatching of connectors and shall be configured so that no damage can occur if a unit is accidentally or intentionally connected to the wrong input channel. Each connector shall make provision for all the necessary signal lines, earth, 0V and 12V (switched) supplied lines.

- The data logger will feature an optional integral pressure sensor for connection to the water pressure.
- f) Enclosure and Housing:
- **Only** compact data loggers will be accepted, therefore all electronic components, wiring, etc., will be fixed / mounted inside the logger housing. **No** logger will be considered should the operator need to open the housing to access the keypad, LC Display, Connectors, etc.
 - The data logger shall be enclosed in wall mounted / standing enclosures, for installation in a recorder hut.
 - The housing shall be manufactured of corrosion resistant material.
 - The data logger / communication unit housing shall not exceed the following dimensions:
 - Height: less than 600 mm;
 - Width: less than 150 mm;
 - Depth: less than 150 mm.
- g) Internal Software Requirements:
- All software packages shall be written and structured in a high level programming language. To conserve memory space, and thus power required, the use of a compiled program is recommended.
 - The data logger operating software shall be located in ROM (EEPROM) and the Bidder shall be responsible for the provision of all the software required for the data logger at no additional cost.
 - The data logger SOFTWARE shall allow the equipment to operate in a completely unattended mode and all reasonable precautions shall be taken in the structuring of the error trapping routines to prevent system hang-up.
 - In order to conserve power, the data logger shall control the power supply to each sensor. Sensors shall be switched on in sequence and readings taken under processor control. The logger must control sufficient warm-up and stabilisation time for sensors.
 - During non-measurement periods power supply to the sensors and signal converter units shall be interrupted for all the analogue channels.
- h) Data storage:
- Data records shall contain the following information:
 - ID no, Sensor/Channel no, Time/Date and measured value.
 - The measured value shall be given in engineering units.
 - Data storage shall be done on a circulating storage system, first in - first out.
 - The memory contents must be retained for two years in the case of a power supply breakdown.

- i) Data display:
 - All conversation between the data logger and the operator shall be done via the display-unit or laptop, tablet or smart device.
 - When connecting to the data logger, the following information should be displayed:
 - Measured values, Date, Time, Battery status.
 - A time-out shall be provided, so that the display will go into a sleeping mode if no keyboard activity is detected for a period.
 - The data logger display will indicate when it is busy with data transfer.
- j) Surge Protection (Accessories):
 - The Bidder shall make provision for and bid separately for surge protection equipment on all system input/output circuits and power supply input (dc, mains) circuits.
 - The following equipment shall be included as an absolute minimum requirement:
 - On all analog /digital input and output circuits – DEHN BLITZDUCTORS TYPE LZ or equivalent with appropriate voltage ratings.
 - On all mains power supply circuits - DEHN type VA-280 surge arrestors or equivalent.
 - The Department may allow the use of alternative types of surge arrestors, provided that equivalent or superior protection levels will be achieved. SABS and/or CSIR test reports to substantiate claims shall be provided for the alternative offers.
 - It is not anticipated that the stated equipment will be used on its own, necessarily, provide the required level of protection and the Bidder shall implement additional measures deemed necessary to achieve the required protection level.
- k) Data acquisition:
 - The data logger shall operate with a fixed interval logging sequences.
 - The operating system should allow for various measurement intervals. The operators shall however be able to select a fixed interval for sample and storing of the data:
 - Minimum sampling time of 60 seconds.

3.6.2. Pressure Transducer:



3.6.2.1. Application:

- a) The submersible pressure transducer will be used for hydrostatic water level measurement and will be measuring pressure using a vented cable.
- b) Pressure transducers must be capable of measuring water levels from 0 - 100 m, the range of each transducer being determined by the Department and pre-set in the factory. Typical ranges could be: 0 - 1 m; 0 – 2.5 m; 0 - 5 m; 0 – 10 m; 0 – 20 m, 0 – 30 m and >40 m on request.
- c) The pressure transducers must have a high reliability and ensure a large range of

application for pressure measurement in all fields of water level measurement.

3.6.2.2. Design and technical details:

a) Pressure Transducer housing:

- The housing must be in an all-sealed enclosure and the pressure port must be vented to the atmosphere using a vented cable.
- The transducer housing must be robust, corrosion-resistant, insensitive to impact and vibration and watertight up to at least 70 m of water column. (>70 m on request).
- The opening to the sensor must be protected by a removable threaded cap to allow for maintenance.
- The transducer housing shall preferably not exceed the following dimensions and weight:
 - Length: 500 mm
 - Diameter: 50 mm
 - Weight: 1 kg
- The transducer housing can be fitted with a watertight plug for connection to the transducer cable.

b) Pressure sensor:

- The submersible pressure transducer sensor must be based on a piezo resistive ceramic or fully welded piezo resistive stainless steel pressure sensor element.
- The measuring cell must be chemically and thermally resistant.
- The pressure sensor must have a compensated operating temperature range of -5°C to +70°C.
- The sensor should be calibrated, temperature compensated and provide amplified analogue output signals for 4-20mA output.
- The sensor should have a supply voltage of between 9 to 32V and must have reverse polarity protection.
- The sensor must have a response time of maximum 35ms with a power consumption not exceeding 250mW. Typical sensor warm-up time must not exceed 2 seconds.
- The sensor proof pressure must be two times the rated pressure range. Proof pressure is the maximum pressure which may be applied without causing damage to the sensing element.
- The pressure sensor must have surge immunity according to EN 61000-4-5 for current output devices with cable lengths longer than 10m.

c) Measuring Accuracy of the Pressure Transducer Sensor:

- The sensor's Non-linearity (Best Straight Line fit), hysteresis (maximum output difference at any point within the operating pressure range for increasing and decreasing pressure) and repeatability must be 0.1 % FSO (Full Scale).

d) Vented Transducer cable:

- The vented cable is factory fitted to the submersible pressure transducer housing and the length of cable for each submersible pressure transducer are being determined by the Department during procurement.
- The pressure transducer and transducer cable shall be designed to function satisfactorily with a cable length of up to 250 m.
- Flexible with Polyurethane jacketing material for corrosive media and maximum outer diameter 12 mm.
- Double sheathing with interposed tinned copper- braiding shielding with polyester with polyester film to cover the vented tube and all connectors.
- There must be filler between the conductors and vent tube and all conductors must be of tin copper.
- As the transducer cable shall be used as the carrying rope, it shall preferably feature, for longitudinal stability, an internal Kevlar core assembly, or equivalent.
- A polyamide pressure-compensation capillary tube for measuring the reference pressure, with an inside diameter of preferably 3 mm, but not less than 1,0 mm.
- End of cable connected by terminal box with hydrophobic filters and exchangeable humidity absorber.
- A fixing clamp for exact positioning of the pressure probe in a stilling well or tube must be available, manufactured of non-corrosive material.

3.6.3. Temperature sensor:

- The transducer must include an integrated temperature sensor.
- Design and technical detail:
 - Platinum resistor type.
 - Measuring range: -5°C to +40°C.
 - Resolution: 0.02°C;
 - Accuracy: ± 0.15°C.

3.6.4. Conductivity Sensor:

- The transducer must include an integrated conductivity sensor.
- Design and technical detail:
 - Measuring range: 0 µS/cm to 100,000 µS/cm (100 mS/cm).
 - Resolution: 0.5 µS / cm;
 - Accuracy: ± 0.5 % of reading.

3.6.5. Transmission:



3.6.5.1. GSM Modem

- The data logger shall incorporate a GSM Modem for the purpose of transmitting and receiving data to and from the network. The GSM modem shall be type approved according to the applicable standards.

3.6.5.2. GSM Modem Frequency Band

- The GSM Modem shall be dual band and should be capable of operating at frequencies of 900 MHz/1800 MHz or 850 Hz/1900 MHz.

3.6.5.3. GSM Modem Antenna:

- The GSM antenna shall be integral to the data logger. The design of the antenna should be such that reliable operation in underground chambers with metal covers is possible and in deep basements, given a good signal level in the surrounding area of the chamber or basement.

3.6.5.4. Low Battery Detection and Reporting:

- It is an essential feature of the GSM data logger that the product remains in full compliance with the GSM specifications. When the power available from the battery of the data logger becomes insufficient for maintaining compliance, the modem operation must be prevented.
- It is therefore an imperative requirement that the data logger should feature a low battery detection system, which prevents GSM functionality when required.
- The data logger will transmit a low battery status along with the data as and when it occurs.

3.6.5.5. SIM Card Compatibility and Replacement:

- The data logger will permit the fitting and replacement of the SIM card by the user. It should support all current forms of SIM cards in common use by GSM operators.

3.6.5.6. Signal Strength Measurement:

- To carry out an installation, the installer will be required to measure the signal strength from the various operators with the product mounted in-situ. In the case of underground locations, this will involve placing the data logger in its anticipated position and measure signal strength with the chamber covers replaced, or in anticipated position in a basement.
- The data logger should therefore have a facility to carry out the unattended recording of signal strength. Subsequent downloading and analysis of the signal strength data then reveals the adequacy of the mounting position, the choice of provider and so on.

3.6.5.7. Choice of Operator:

- The data logger will operate with any of the GSM operators' networks.

3.6.5.8. Transmission of Data:

- The data logger will be programmed to initiate data transmission daily, weekly or monthly at a user selected time. The logger will assemble the data to be transmitted in the form of packets of suitable length and format to be transmitted as a number of SMS's.
- Data to be transmitted will be any data, which has not been previously sent, or, at the request of the data centre any data recorded from a particular date and time.
- The data logger will send its SMS's at the time selected, and await

acknowledgment by the network that the messages have been received.

- In the event that the network rejects the SMS's or is not able to confirm their receipt, the data logger will proceed through a retry algorithm.
- In the event that the retry algorithm fails, the data will be considered as not sent, and the data logger will record a communication error.
- The data logger will keep up to date a journal of all errors incurred in communication with the Modem and the GSM network including failure to register on the network, failure to send SMS, failure to read the SIM card, and so on.
- At the user's option, any new entry in the communication journal will be sent together with the data at data transmission time
- The format for the data sent in the form of SMS may be proprietary but should be 8-bit data coding scheme for maximum efficiency and include error checking so that any data corruption caused by the GSM network may be detected and removed.

3.6.5.9. Data Compression:

- The operating cost of the GSM data logger will be closely related to the amount of SMS's, which it will generate when transmitting data. It is an imperative requirement that an optimum method of data compression is implemented to minimize the number of SMS's sent for a given recording strategy. Manufacturers will demonstrate compliance to this clause by documenting their compression algorithm or by disclosing the number of SMS's required for given data logging configurations (i.e. 15-minute recording of one flow and one pressure channels).

3.6.5.10. Transmission of Alarms:

- In addition to sending data at a selected frequency and time, the data logger will also transmit information if alarm conditions occur.

3.6.5.11. Alarm Functionality

- For each channel, the alarm condition will be defined as any of the following events:
 - An input channel being found in an alarm condition
 - A state transition occurring from the signal being found in a normal transition to an alarm condition
 - A state transition occurring from the signal being found in an alarm condition to a normal condition
- For each channel, the user can select any combination of the above.
- An alarm is defined as:
 - The exceedance of a fixed threshold
 - The exceedance of a 24-hour profile
- A 24-hour profile is a set of consecutive values of the input stored in the data logger memory and selected by the user. The logger shall support up to two (high and low) profiles for each channel for week days and up to two profiles for each channel for Saturdays and Sundays.
- There shall be a facility to define a time window for each profile inside which the

alarm thresholds or profiles shall apply.

- When an alarm event occurs, the data logger will carry out the following:
 - Immediately attempt to send the alarm to the data centre (following the same procedure as for data)
 - At the user's option, proceed to send new data at a user selectable interval for a user selectable time.

3.6.5.12. Hourly 2-way Communication, Remote Product Programming and Control:

- In normal operation the data logger shall receive SMS's transmitted to it at the time of data transmission. The SMS received by the data logger should permit remote programming and control. Features to be carried in this way should include as a minimum:
 - Changing the time and frequency of data transmission
 - Changing the destination of transmitted SMS
 - Accept request for SMS transmission of data, index, comms error journal
 - Change alarm settings
 - Change alarm threshold and profiles
- For advanced applications where more immediate 2-way communication and remote programming is required the data logger will be configured to register on the GSM network once every hour. This will allow the data logger to receive SMS transmitted from the user requesting one or more of the features listed above. The implementation of this feature should not affect the estimated battery life.

3.6.5.13. Data Poll Option:

- As standard, the GSM data logger as specified will operate in an inbound system when data is regularly sent from the data logger sites to a data collection centre.
- For certain applications, it may be required that the data is transmitted 'on-demand'. In these cases, the manufacturer will offer the data logging unit programmed to register on the GSM network once every hour. The user can then send an SMS to the unit requesting the latest data and receive the information within an hour.
- This system will have the advantage of only using SMS text messaging and will be much less susceptible to poor signal strength.

3.7. Multi-channel data logger with integrated sensors: pressure transducer (non-vented) and temperature sensor.

3.7.1. Multi-channel data logger:

a) Data Processing: ☐

- Only intelligent data loggers, equipped with a microprocessor will be considered.
- The data logger shall be equipped with a CPU watchdog circuit that will automatically restart the system in case of a severe electrical or electromagnetic disturbance.

b) Real time clock: ☐

- The data loggers shall be equipped with battery backed hardware real time clock system.
- The real time clock system shall provide time (24-hour system) and date information and shall make provision for leap years.
- The accuracy and stability of the real time clock shall be better than ± 30 seconds per month, operating under the environmental conditions listed above in SECTION 3: STANDARD SPECIFICATIONS.

c) Memory: ☐

The data loggers shall be provided with the following types of memory systems:

- Non-volatile memory for system and station parameters and user defined variables.
- Battery backed RAM for intermediate data storage and processing. (Minimum 128 KB) Stored data at 12 minute intervals more than 2 years if not downloaded.

d) Power supply: ☐

- Each data logger shall be provided with an internal source that would prevent equipment shutdown or loss of data when the main battery is either disconnected for a short period or exchanged. (± 12 minutes)
- Power for all the sensors will be derived from the internal main battery via the data logger for more than 2 years at an interval of 12 minutes.
- The logger must have low power consumption on standby mode.
- Loggers with non-standard batteries that cannot be replaced by the operator must have a battery life of at least 5 years at an hourly logging interval under the specified operating temperatures.
- Loggers with batteries that can be replaced by the operator must have a battery life of at least 6 months at an hourly logging interval under the specified operating temperatures.
- The data logger must be reverse polarity protected.
- The logger must be programmable to log at a fixed rate or multiple logging intervals from 1 minute to 12 hours.

- e) Input functions and interfacing: ☐
- The analogue input signals shall be measured to an overall accuracy of better than 0.5 to 0.1%. The input circuits shall be so designed that no errors will be introduced by ground loops.
 - In order to conserve power, the data logger shall control the power supply to each sensor. Sensors shall be switched on in sequence and readings taken under processor control. Sufficient warm-up and stabilization time for sensors must be controlled by the logger.
 - During non-measurement periods power supply to the sensors and signal converter units shall be interrupted for all the analogue channels.
 - Full calibration procedures shall be provided for each sensor / signal conditioning unit.
 - Input connectors for sensors shall be clearly labelled, shall be polarized to prevent mismatching of connectors and shall be configured so that no damage can occur if a unit is accidentally or intentionally connected to the wrong input channel. Each connector shall make provision for all the necessary signal lines, earth, 0V and 12V (switched) supplied lines.
- f) Enclosure and Housing: ☐
- **Only** compact data loggers will be accepted, therefore all electronic components, wiring, etc., will be fixed / mounted inside the logger housing. **No** logger will be considered should the operator need to open the housing to access the keypad, LC Display, Connectors, etc.
 - The data logger shall be enclosed in wall mounted / standing enclosures, for installation in a recorder hut.
 - The housing shall be manufactured of corrosion resistant material.
 - The data logger / communication unit housing shall not exceed the following dimensions:
 - Height: less than 600 mm;
 - Width: less than 150 mm;
 - Depth: less than 150 mm.
- g) Internal Software Requirements:
- All software packages shall be written and structured in a high level programming language. To conserve memory space, and thus power required, the use of a compiled program is recommended.
 - The data logger operating software shall be located in ROM (EPROM) and the Bidder shall be responsible for the provision of all the software required for the data logger at no additional cost.
 - The data logger SOFTWARE shall allow the equipment to operate in a completely unattended mode and all reasonable precautions shall be taken in the structuring of the error trapping routines to prevent system hang-up.
 - In order to conserve power, the data logger shall control the power supply to each sensor. Sensors shall be switched on in sequence and readings taken under

processor control. The logger must control sufficient warm-up and stabilisation time for sensors.

- During non-measurement periods power supply to the sensors and signal converter units shall be interrupted for all the analogue channels.

h) Data storage:

- Data records shall contain the following information: ☐
 - ID no, Sensor/Channel no, Time/Date and measured value.
 - The measured value shall be given in engineering units.
- Data storage shall be done on a circulating storage system, first in - first out.
- The memory contents must be retained for two years in the case of a power supply breakdown.

i) Data display:

- All conversation between the data logger and the operator shall be done via the display-unit or laptop, tablet or smart device. ☐
- The data logger display will indicate when it is busy with data transfer.

j) Surge Protection (Accessories):

- The Bidder shall make provision for and bid separately for surge protection equipment on all system input/output circuits and power supply input (dc, mains) circuits. ☐
- The following equipment shall be included as an absolute minimum requirement:
 - On all analog /digital input and output circuits – DEHN BLITZDUCTORS TYPE LZ or equivalent with appropriate voltage ratings.
 - On all mains power supply circuits - DEHN type VA-280 surge arrestors or equivalent.
 - The Department may allow the use of alternative types of surge arrestors, provided that equivalent or superior protection levels will be achieved. SABS and/or CSIR test reports to substantiate claims shall be provided for the alternative offers.
 - It is not anticipated that the stated equipment will be used on its own, necessarily, provide the required level of protection and the Bidder shall implement additional measures deemed necessary to achieve the required protection level.

k) Data acquisition:

- The data logger shall operate with a fixed interval logging sequences. ☐
- The operating system should allow for various measurement intervals. The operators shall however be able to select a fixed interval for sample and storing of the data:
 - Minimum sampling time of 60 seconds.

3.7.2. Pressure Transducer:

☐

3.7.2.1. Application

- a) The submersible pressure transducer will be used for hydrostatic water level measurement and will be measuring absolute pressure using a non-vented pressure sensor.
- b) Pressure transducers must be capable of measuring water levels from 0 - 100 m, the range of each transducer being determined by the Department and pre-set in the factory. Typical ranges could be: 0 - 1 m; 0 – 2.5 m; 0 - 5 m; 0 – 10 m; 0 – 20 m, 0 – 30 m and >40 m on request.
- c) The pressure transducers must have a high reliability and ensure a large range of application for pressure measurement in all fields of water level measurement.

3.7.2.2. Design and Technical Details:



a) Pressure Transducer housing:

- The housing must be in an all-sealed enclosure.
- The transducer housing must be robust, corrosion-resistant, insensitive to impact and vibration and watertight up to at least 70 m of water column. (>70 m on request).
- The opening to the sensor must be protected by a removable threaded cap to allow for maintenance.
- The transducer housing shall preferably not exceed the following dimensions and weight:
 - Length: 500 mm
 - Diameter: 50 mm
 - Weight: 1 kg

b) Pressure Transducer sensor:



- The submersible pressure transducer sensor must be based on a piezo resistive stainless steel (or similar) pressure sensor element.
- The measuring cell must be chemically and thermally resistant.
- The pressure sensor must have a compensated operating temperature range of - 5°C to +70°C.
- The sensor proof pressure must be two times the rated pressure range. Proof pressure is the maximum pressure which may be applied without causing damage to the sensing element.

c) Measuring Accuracy of the Pressure Transducer Sensor:

- The sensor's Non-linearity (Best Straight Line fit), hysteresis (maximum output difference at any point within the operating pressure range for increasing and decreasing pressure) and repeatability must be 0.1 % FSO (Full Scale).

3.7.3. Temperature sensor:



- The pressure transducer should preferably have an integrated temperature sensor, preferably of the platinum resistor type. The sensitivity of the measuring element shall be approximately 0,1 °C between a temperature range of at least - 5°C to +40°C.

3.8. Multi-channel data logger with integrated sensors: pressure transducer (non-vented) and temperature sensor; with barometric pressure compensator.

3.8.1. Multi-channel data logger:

a) Data Processing:

☐

- Only intelligent data loggers, equipped with a microprocessor will be considered.
- The data logger shall be equipped with a CPU watchdog circuit that will automatically restart the system in case of a severe electrical or electromagnetic disturbance.

b) Real time clock:

☐

- The data loggers shall be equipped with battery backed hardware real time clock system.
- The real time clock system shall provide time (24-hour system) and date information and shall make provision for leap years.
- The accuracy and stability of the real time clock shall be better than ± 30 seconds per month, operating under the environmental conditions listed above in SECTION 3: STANDARD SPECIFICATIONS.

c) Memory:

☐

The data loggers shall be provided with the following types of memory systems:

- Non-volatile memory for system and station parameters and user defined variables.
- Battery backed RAM for intermediate data storage and processing. (Minimum 128 KB) Stored data at 12 minute intervals more than 2 years if not downloaded.

d) Power supply:

☐

- Each data logger shall be provided with an internal source that would prevent equipment shutdown or loss of data when the main battery is either disconnected for a short period or exchanged. (± 12 minutes)
- Power for all the sensors will be derived from the internal main battery via the data logger for more than 2 years at an interval of 12 minutes.
- The logger must have low power consumption on standby mode.
- Loggers with non-standard batteries that cannot be replaced by the operator must have a battery life of at least 5 years at an hourly logging interval under the specified operating temperatures.
- Loggers with batteries that can be replaced by the operator must have a battery life of at least 6 months at an hourly logging interval under the specified operating temperatures.
- The data logger must be reverse polarity protected.
- The logger must be programmable to log at a fixed rate or multiple logging intervals from 1 minute to 12 hours.

- e) Input functions and interfacing: ☐
- The analogue input signals shall be measured to an overall accuracy of better than 0.5 to 0.1%. The input circuits shall be so designed that no errors will be introduced by ground loops.
 - In order to conserve power, the data logger shall control the power supply to each sensor. Sensors shall be switched on in sequence and readings taken under processor control. Sufficient warm-up and stabilization time for sensors must be controlled by the logger.
 - During non-measurement periods power supply to the sensors and signal converter units shall be interrupted for all the analogue channels.
 - Full calibration procedures shall be provided for each sensor / signal conditioning unit.
 - Input connectors for sensors shall be clearly labelled, shall be polarized to prevent mismatching of connectors and shall be configured so that no damage can occur if a unit is accidentally or intentionally connected to the wrong input channel. Each connector shall make provision for all the necessary signal lines, earth, 0V and 12V (switched) supplied lines.
- f) Enclosure and Housing: ☐
- **Only** compact data loggers will be accepted, therefore all electronic components, wiring, etc., will be fixed / mounted inside the logger housing. **No** logger will be considered should the operator need to open the housing to access the keypad, LC Display, Connectors, etc.
 - The data logger shall be enclosed in wall mounted / standing enclosures, for installation in a recorder hut.
 - The housing shall be manufactured of corrosion resistant material.
 - The data logger / communication unit housing shall not exceed the following dimensions:
 - Height: less than 600 mm;
 - Width: less than 150 mm;
 - Depth: less than 150 mm.
- g) Internal Software Requirements:
- All software packages shall be written and structured in a high level programming language. To conserve memory space, and thus power required, the use of a compiled program is recommended.
 - The data logger operating software shall be located in ROM (EPROM) and the Bidder shall be responsible for the provision of all the software required for the data logger at no additional cost.
 - The data logger SOFTWARE shall allow the equipment to operate in a completely unattended mode and all reasonable precautions shall be taken in the structuring of the error trapping routines to prevent system hang-up.
 - In order to conserve power, the data logger shall control the power supply to each sensor. Sensors shall be switched on in sequence and readings taken under processor control. The logger must control sufficient warm-up and stabilisation time

for sensors.

- During non-measurement periods power supply to the sensors and signal converter units shall be interrupted for all the analogue channels.
- h) Data storage: ☐
- Data records shall contain the following information:
 - ID no, Sensor/Channel no, Time/Date and measured value.
 - The measured value shall be given in engineering units.
 - Data storage shall be done on a circulating storage system, first in - first out.
 - The memory contents must be retained for two years in the case of a power supply breakdown.
- i) Data display: ☐
- All conversation between the data logger and the operator shall be done via the display-unit or laptop, tablet or smart device.
 - The data logger display will indicate when it is busy with data transfer.
- j) Surge Protection (Accessories): ☐
- The Bidder shall make provision for and bid separately for surge protection equipment on all system input/output circuits and power supply input (dc, mains) circuits.
 - The following equipment shall be included as an absolute minimum requirement:
 - On all analog /digital input and output circuits – DEHN BLITZDUCTORS TYPE LZ or equivalent with appropriate voltage ratings.
 - On all mains power supply circuits - DEHN type VA-280 surge arrestors or equivalent.
 - The Department may allow the use of alternative types of surge arrestors, provided that equivalent or superior protection levels will be achieved. SABS and/or CSIR test reports to substantiate claims shall be provided for the alternative offers.
 - It is not anticipated that the stated equipment will be used on its own, necessarily, provide the required level of protection and the Bidder shall implement additional measures deemed necessary to achieve the required protection level.
- k) Data acquisition: ☐
- The data logger shall operate with a fixed interval logging sequences.
 - The operating system should allow for various measurement intervals. The operators shall however be able to select a fixed interval for sample and storing of the data:
 - Minimum sampling time of 60 seconds.

3.8.2. Pressure Transducer:



3.8.2.1. Application

- d) The submersible pressure transducer will be used for hydrostatic water level measurement and will be measuring absolute pressure using a non-vented pressure sensor.
- e) Pressure transducers must be capable of measuring water levels from 0 - 100 m, the range of each transducer being determined by the Department and pre-set in the factory. Typical ranges could be: 0 - 1 m; 0 – 2.5 m; 0 - 5 m; 0 – 10 m; 0 – 20 m, 0 – 30 m and >40 m on request.
- f) The pressure transducers must have a high reliability and ensure a large range of application for pressure measurement in all fields of water level measurement.

3.8.2.2. Design and Technical Details:



d) Pressure Transducer housing:

- The housing must be in an all-sealed enclosure.
- The transducer housing must be robust, corrosion-resistant, insensitive to impact and vibration and watertight up to at least 70 m of water column. (>70 m on request).
- The opening to the sensor must be protected by a removable threaded cap to allow for maintenance.
- The transducer housing shall preferably not exceed the following dimensions and weight:
 - Length: 500 mm
 - Diameter: 50 mm
 - Weight: 1 kg

e) Pressure Transducer sensor:



- The submersible pressure transducer sensor must be based on a piezo resistive stainless steel (or similar) pressure sensor element.
- The measuring cell must be chemically and thermally resistant.
- The pressure sensor must have a compensated operating temperature range of - 5°C to +70°C.
- The sensor proof pressure must be two times the rated pressure range. Proof pressure is the maximum pressure which may be applied without causing damage to the sensing element.

f) Measuring Accuracy of the Pressure Transducer Sensor:

- The sensor's Non-linearity (Best Straight Line fit), hysteresis (maximum output difference at any point within the operating pressure range for increasing and decreasing pressure) and repeatability must be 0.1 % FSO (Full Scale).

3.8.3. Temperature sensor:



- The pressure transducer should preferably have an integrated temperature sensor, preferably of the platinum resistor type. The sensitivity of the measuring element shall be approximately 0,1 °C between a temperature range of at least -5°C to +40°C.

3.8.4. Barometric compensator:



3.8.4.1. Application:

- The pressure measurement must preferably operate, using the barometric pressure method.

3.8.4.2. Design and technical details:

- | | |
|---------------|-----------------|
| - Resolution: | 0.1mm hPa |
| - Range: | 600 to 1060 hPa |
| - Accuracy: | 0.8 mm hPa |

3.9. Multi-channel data logger with integrated sensors: pressure transducer (non-vented), temperature- and conductivity sensor.

3.9.1. Multi-channel data logger:

a) Data Processing:

☐

- Only intelligent data loggers, equipped with a microprocessor will be considered.
- The data logger shall be equipped with a CPU watchdog circuit that will automatically restart the system in case of a severe electrical or electromagnetic disturbance.

b) Real time clock:

☐

- The data loggers shall be equipped with battery backed hardware real time clock system.
- The real time clock system shall provide time (24-hour system) and date information and shall make provision for leap years.
- The accuracy and stability of the real time clock shall be better than ± 30 seconds per month, operating under the environmental conditions listed above in SECTION 3: STANDARD SPECIFICATIONS.

c) Memory:

☐

The data loggers shall be provided with the following types of memory systems:

- Non-volatile memory for system and station parameters and user defined variables.
- Battery backed RAM for intermediate data storage and processing. (Minimum 128 KB) Stored data at 12 minute intervals more than 2 years if not downloaded.

d) Power supply:

☐

- Each data logger shall be provided with an internal source that would prevent equipment shutdown or loss of data when the main battery is either disconnected for a short period or exchanged. (± 12 minutes)
- Power for all the sensors will be derived from the internal main battery via the data logger for more than 2 years at an interval of 12 minutes.
- The logger must have low power consumption on standby mode.
- Loggers with non-standard batteries that cannot be replaced by the operator must have a battery life of at least 5 years at an hourly logging interval under the specified operating temperatures.
- Loggers with batteries that can be replaced by the operator must have a battery life of at least 6 months at an hourly logging interval under the specified operating temperatures.
- The data logger must be reverse polarity protected.
- The logger must be programmable to log at a fixed rate or multiple logging intervals from 1 minute to 12 hours.

- e) Input functions and interfacing: ☐
- The analogue input signals shall be measured to an overall accuracy of better than 0.5 to 0.1%. The input circuits shall be so designed that no errors will be introduced by ground loops.
 - In order to conserve power, the data logger shall control the power supply to each sensor. Sensors shall be switched on in sequence and readings taken under processor control. Sufficient warm-up and stabilization time for sensors must be controlled by the logger.
 - During non-measurement periods power supply to the sensors and signal converter units shall be interrupted for all the analogue channels.
 - Full calibration procedures shall be provided for each sensor / signal conditioning unit.
 - Input connectors for sensors shall be clearly labelled, shall be polarized to prevent mismatching of connectors and shall be configured so that no damage can occur if a unit is accidentally or intentionally connected to the wrong input channel. Each connector shall make provision for all the necessary signal lines, earth, 0V and 12V (switched) supplied lines.
- f) Enclosure and Housing: ☐
- **Only** compact data loggers will be accepted, therefore all electronic components, wiring, etc., will be fixed / mounted inside the logger housing. **No** logger will be considered should the operator need to open the housing to access the keypad, LC Display, Connectors, etc.
 - The data logger shall be enclosed in wall mounted / standing enclosures, for installation in a recorder hut.
 - The housing shall be manufactured of corrosion resistant material.
 - The data logger / communication unit housing shall not exceed the following dimensions:
 - Height: less than 600 mm;
 - Width: less than 150 mm;
 - Depth: less than 150 mm.
- g) Internal Software Requirements:
- All software packages shall be written and structured in a high level programming language. To conserve memory space, and thus power required, the use of a compiled program is recommended.
 - The data logger operating software shall be located in ROM (EPROM) and the Bidder shall be responsible for the provision of all the software required for the data logger at no additional cost.
 - The data logger SOFTWARE shall allow the equipment to operate in a completely unattended mode and all reasonable precautions shall be taken in the structuring of the error trapping routines to prevent system hang-up.
 - In order to conserve power, the data logger shall control the power supply to each sensor. Sensors shall be switched on in sequence and readings taken under processor control. The logger must control sufficient warm-up and stabilisation time

for sensors.

- During non-measurement periods power supply to the sensors and signal converter units shall be interrupted for all the analogue channels.
- h) Data storage: ☐
- Data records shall contain the following information:
 - ID no, Sensor/Channel no, Time/Date and measured value.
 - The measured value shall be given in engineering units.
 - Data storage shall be done on a circulating storage system, first in - first out.
 - The memory contents must be retained for two years in the case of a power supply breakdown.
- i) Data display: ☐
- All conversation between the data logger and the operator shall be done via the display-unit or laptop, tablet or smart device.
 - The data logger display will indicate when it is busy with data transfer.
- j) Surge Protection (Accessories): ☐
- The Bidder shall make provision for and bid separately for surge protection equipment on all system input/output circuits and power supply input (dc, mains) circuits.
 - The following equipment shall be included as an absolute minimum requirement:
 - On all analog /digital input and output circuits – DEHN BLITZDUCTORS TYPE LZ or equivalent with appropriate voltage ratings.
 - On all mains power supply circuits - DEHN type VA-280 surge arrestors or equivalent.
 - The Department may allow the use of alternative types of surge arrestors, provided that equivalent or superior protection levels will be achieved. SABS and/or CSIR test reports to substantiate claims shall be provided for the alternative offers.
 - It is not anticipated that the stated equipment will be used on its own, necessarily, provide the required level of protection and the Bidder shall implement additional measures deemed necessary to achieve the required protection level.
- k) Data acquisition: ☐
- The data logger shall operate with a fixed interval logging sequences.
 - The operating system should allow for various measurement intervals. The operators shall however be able to select a fixed interval for sample and storing of the data:
 - Minimum sampling time of 60 seconds.

3.9.2. Pressure Transducer:



3.9.2.1. Application

- g) The submersible pressure transducer will be used for hydrostatic water level measurement and will be measuring absolute pressure using a non-vented pressure sensor.
- h) Pressure transducers must be capable of measuring water levels from 0 - 100 m, the range of each transducer being determined by the Department and pre-set in the factory. Typical ranges could be: 0 - 1 m; 0 – 2.5 m; 0 - 5 m; 0 – 10 m; 0 – 20 m, 0 – 30 m and >40 m on request.
- i) The pressure transducers must have a high reliability and ensure a large range of application for pressure measurement in all fields of water level measurement.

3.9.2.2. Design and Technical Details:



g) Pressure Transducer housing:

- The housing must be in an all-sealed enclosure.
- The transducer housing must be robust, corrosion-resistant, insensitive to impact and vibration and watertight up to at least 70 m of water column. (>70 m on request).
- The opening to the sensor must be protected by a removable threaded cap to allow for maintenance.
- The transducer housing shall preferably not exceed the following dimensions and weight:
 - Length: 500 mm
 - Diameter: 50 mm
 - Weight: 1 kg

h) Pressure Transducer sensor:



- The submersible pressure transducer sensor must be based on a piezo resistive stainless steel (or similar) pressure sensor element.
 - The measuring cell must be chemically and thermally resistant.
 - The pressure sensor must have a compensated operating temperature range of - 5°C to +70°C.
 - The sensor proof pressure must be two times the rated pressure range. Proof pressure is the maximum pressure which may be applied without causing damage to the sensing element.
- i) Measuring Accuracy of the Pressure Transducer Sensor:
- The sensor's Non-linearity (Best Straight Line fit), hysteresis (maximum output difference at any point within the operating pressure range for increasing and decreasing pressure) and repeatability must be 0.1 % FSO (Full Scale).

3.9.3. Temperature sensor:



- The pressure transducer should preferably have an integrated temperature sensor, preferably of the platinum resistor type. The sensitivity of the measuring element shall be approximately 0,1 °C between a temperature range of at least -5°C to +40°C.

3.9.4. Conductivity Sensor:



- The transducer must include an integrated conductivity sensor.
- Design and technical detail:
 - Measuring range: 0 µS/cm to 100,000 µS/cm (100 mS/cm).
 - Resolution: 0.5 µS / cm;
 - Accuracy: ± 0.5 % of reading.

3.10. Multi-channel data logger with integrated sensors: pressure transducer (non-vented), temperature- and conductivity sensor; with barometric pressure compensator:

3.10.1. Multi-channel data logger:

a) Data Processing: ☐

- Only intelligent data loggers, equipped with a microprocessor will be considered.
- The data logger shall be equipped with a CPU watchdog circuit that will automatically restart the system in case of a severe electrical or electromagnetic disturbance.

b) Real time clock: ☐

- The data loggers shall be equipped with battery backed hardware real time clock system.
- The real time clock system shall provide time (24-hour system) and date information and shall make provision for leap years.
- The accuracy and stability of the real time clock shall be better than ± 30 seconds per month, operating under the environmental conditions listed above in SECTION 3: STANDARD SPECIFICATIONS.

c) Memory: ☐

The data loggers shall be provided with the following types of memory systems:

- Non-volatile memory for system and station parameters and user defined variables.
- Battery backed RAM for intermediate data storage and processing. (Minimum 128 KB) Stored data at 12 minute intervals more than 2 years if not downloaded.

d) Power supply: ☐

- Each data logger shall be provided with an internal source that would prevent equipment shutdown or loss of data when the main battery is either disconnected for a short period or exchanged. (± 12 minutes)
- Power for all the sensors will be derived from the internal main battery via the data logger for more than 2 years at an interval of 12 minutes.
- The logger must have low power consumption on standby mode.
- Loggers with non-standard batteries that cannot be replaced by the operator must have a battery life of at least 5 years at an hourly logging interval under the specified operating temperatures.
- Loggers with batteries that can be replaced by the operator must have a battery life of at least 6 months at an hourly logging interval under the specified operating temperatures.
- The data logger must be reverse polarity protected.
- The logger must be programmable to log at a fixed rate or multiple logging intervals from 1 minute to 12 hours.

- e) Input functions and interfacing: ☐
- The analogue input signals shall be measured to an overall accuracy of better than 0.5 to 0.1%. The input circuits shall be so designed that no errors will be introduced by ground loops.
 - In order to conserve power, the data logger shall control the power supply to each sensor. Sensors shall be switched on in sequence and readings taken under processor control. Sufficient warm-up and stabilization time for sensors must be controlled by the logger.
 - During non-measurement periods power supply to the sensors and signal converter units shall be interrupted for all the analogue channels.
 - Full calibration procedures shall be provided for each sensor / signal conditioning unit.
 - Input connectors for sensors shall be clearly labelled, shall be polarized to prevent mismatching of connectors and shall be configured so that no damage can occur if a unit is accidentally or intentionally connected to the wrong input channel. Each connector shall make provision for all the necessary signal lines, earth, 0V and 12V (switched) supplied lines.
- f) Enclosure and Housing: ☐
- **Only** compact data loggers will be accepted, therefore all electronic components, wiring, etc., will be fixed / mounted inside the logger housing. **No** logger will be considered should the operator need to open the housing to access the keypad, LC Display, Connectors, etc.
 - The data logger shall be enclosed in wall mounted / standing enclosures, for installation in a recorder hut.
 - The housing shall be manufactured of corrosion resistant material.
 - The data logger / communication unit housing shall not exceed the following dimensions:
 - Height: less than 600 mm;
 - Width: less than 150 mm;
 - Depth: less than 150 mm.
- g) Internal Software Requirements:
- All software packages shall be written and structured in a high level programming language. To conserve memory space, and thus power required, the use of a compiled program is recommended.
 - The data logger operating software shall be located in ROM (EPROM) and the Bidder shall be responsible for the provision of all the software required for the data logger at no additional cost.
 - The data logger SOFTWARE shall allow the equipment to operate in a completely unattended mode and all reasonable precautions shall be taken in the structuring of the error trapping routines to prevent system hang-up.
 - In order to conserve power, the data logger shall control the power supply to each sensor. Sensors shall be switched on in sequence and readings taken under processor control. The logger must control sufficient warm-up and stabilisation time

for sensors.

- During non-measurement periods power supply to the sensors and signal converter units shall be interrupted for all the analogue channels.
- h) Data storage: ☐
- Data records shall contain the following information:
 - ID no, Sensor/Channel no, Time/Date and measured value.
 - The measured value shall be given in engineering units.
 - Data storage shall be done on a circulating storage system, first in - first out.
 - The memory contents must be retained for two years in the case of a power supply breakdown.
- i) Data display: ☐
- All conversation between the data logger and the operator shall be done via the display-unit or laptop, tablet or smart device.
 - The data logger display will indicate when it is busy with data transfer.
- j) Surge Protection (Accessories): ☐
- The Bidder shall make provision for and bid separately for surge protection equipment on all system input/output circuits and power supply input (dc, mains) circuits.
 - The following equipment shall be included as an absolute minimum requirement:
 - On all analog /digital input and output circuits – DEHN BLITZDUCTORS TYPE LZ or equivalent with appropriate voltage ratings.
 - On all mains power supply circuits - DEHN type VA-280 surge arrestors or equivalent.
 - The Department may allow the use of alternative types of surge arrestors, provided that equivalent or superior protection levels will be achieved. SABS and/or CSIR test reports to substantiate claims shall be provided for the alternative offers.
 - It is not anticipated that the stated equipment will be used on its own, necessarily, provide the required level of protection and the Bidder shall implement additional measures deemed necessary to achieve the required protection level.
- k) Data acquisition: ☐
- The data logger shall operate with a fixed interval logging sequences.
 - The operating system should allow for various measurement intervals. The operators shall however be able to select a fixed interval for sample and storing of the data:
 - Minimum sampling time of 60 seconds.

3.10.2. Pressure Transducer:



3.10.2.1. Application

- j) The submersible pressure transducer will be used for hydrostatic water level measurement and will be measuring absolute pressure using a non-vented pressure sensor.
- k) Pressure transducers must be capable of measuring water levels from 0 - 100 m, the range of each transducer being determined by the Department and pre-set in the factory. Typical ranges could be: 0 - 1 m; 0 – 2.5 m; 0 - 5 m; 0 – 10 m; 0 – 20 m, 0 – 30 m and >40 m on request.
- l) The pressure transducers must have a high reliability and ensure a large range of application for pressure measurement in all fields of water level measurement.

3.10.2.2. Design and Technical Details:



j) Pressure Transducer housing:

- The housing must be in an all-sealed enclosure.
- The transducer housing must be robust, corrosion-resistant, insensitive to impact and vibration and watertight up to at least 70 m of water column. (>70 m on request).
- The opening to the sensor must be protected by a removable threaded cap to allow for maintenance.
- The transducer housing shall preferably not exceed the following dimensions and weight:
 - Length: 500 mm
 - Diameter: 50 mm
 - Weight: 1 kg

k) Pressure Transducer sensor:



- The submersible pressure transducer sensor must be based on a piezo resistive stainless steel (or similar) pressure sensor element.
- The measuring cell must be chemically and thermally resistant.
- The pressure sensor must have a compensated operating temperature range of - 5°C to +70°C.
- The sensor proof pressure must be two times the rated pressure range. Proof pressure is the maximum pressure which may be applied without causing damage to the sensing element.

l) Measuring Accuracy of the Pressure Transducer Sensor:

- The sensor's Non-linearity (Best Straight Line fit), hysteresis (maximum output difference at any point within the operating pressure range for increasing and decreasing pressure) and repeatability must be 0.1 % FSO (Full Scale).

3.10.3. Temperature sensor:



- The pressure transducer should preferably have an integrated temperature sensor, preferably of the platinum resistor type. The sensitivity of the measuring element shall be approximately 0,1 °C between a temperature range of at least -5°C to +40°C.

3.10.4. Conductivity Sensor:



- The transducer must include an integrated conductivity sensor.
- Design and technical detail:
 - Measuring range: 0 µS/cm to 100,000 µS/cm (100 mS/cm).
 - Resolution: 0.5 µS / cm;
 - Accuracy: ± 0.5 % of reading.

3.10.5. Barometric compensator:



3.10.5.1. Application:

- The pressure measurement must preferably operate, using the barometric pressure method.

3.10.5.2. Design and technical details:

- Resolution: 0.1mm hPa
- Range: 600 to 1060 hPa
- Accuracy: 0.8 mm hPa

3.11. Multi-channel data logger with integrated pressure (non-vented), temperature and conductivity sensors – for unattended deployment with no cables attached:

3.11.1. Application

- a) This logger will be used for water quality depth profiling and permanent submerged deployment in boreholes, rivers, or dams.

3.11.2. Design and technical requirements:

- a) The logger is not required to have salinity or TDS as standard data outputs.
- b) Output specific conductance at 25°C is a requirement.
- c) This logger will be offered as standard with integrated temperature sensor, electrical conductivity sensor, pressure sensor.
- d) Communication port water proofing cap must be included as standard.
- e) The logger must have a factory sealed internal battery with a battery life of at least 7 years at 5-minute measuring intervals.
- f) The logger must be fully programmable for unattended deployment with no cable attached.
- g) The minimum measurement rate must be less than 5 seconds.
- h) The logger may not have a permanently fixed communication cable.
- i) An external barometric logger with automatic level correction software from the same brand must be available.
- j) Field logger setup and data uploads must be possible via an android device with Bluetooth communication. A dedicated Bluetooth communication cable together with a dedicated android application of the same brand must be available for this purpose if required
- k) Logger diameter must be less than 2.5 cm with the length less than 20 cm;
- l) Extras, communication cable, operating software and spares to be listed and priced as sub items.

3.12. Multi-Channel Data Logger with integrated pressure (non-vented), temperature and conductivity sensors, with practical salinity scale output – for unattended deployment with no cables attached:

3.12.1. Application

- a) This logger will be used for water quality depth profiling and permanent submerged deployment in boreholes, rivers, or dams. Practical salinity scale data output is a requirement for marine and estuarine monitoring.

3.12.2. Design and technical requirements:

- a) The logger is not required to have salinity or TDS as standard data outputs.
- b) Must report on salinity in terms of the practical salinity scale.
- c) This logger will be offered standard with integrated temperature sensor, electrical conductivity sensor, pressure sensor and
- d) Communication port water proofing cap must be included as standard.
- e) The logger must have a factory sealed internal battery with a battery life of at least 5 years at hourly measuring intervals.
- f) The logger must be fully programmable for unattended deployment with no cable attached.
- g) The logger may not have a fixed communication cable.
- h) The logger must be available in vented or non-vented form. Vented cable must be available if required.
- i) For non-vented use an external barometric logger with automatic level correction software from the same brand must be available.
- j) Field logger setup and data uploads must be possible via an android device with Bluetooth communication. A dedicated Bluetooth communication cable together with a dedicated android application of the same brand must be available for this purpose if required.
- k) Logger diameter must be less than 2 cm with the length less than 32 cm;
- l) Extras, communication cable, operating software and spares to be listed and priced as sub items.

3.13. Multi-channel data logger with integrated level, temperature and conductivity sensors – for permanent submerged deployment with fixed (non-removable) communication cable and vented tube:

3.13.1. Application

- a) This logger will be used for permanent submerged deployment in boreholes, rivers, estuaries or dams.

3.13.2. Design and technical requirements:

- a) The logger must have salinity and TDS as standard data outputs.
- b) Must report on salinity in terms of the practical salinity scale.
- c) This logger will be offered as standard with integrated temperature sensor, electrical conductivity sensor, pressure sensor and fixed cable of which the length is to be specified when ordered.
- d) The battery compartment and communication port must be on the non-submersible side of the communication cable. The logger must operate on standard 1.5V/AA or AAA type batteries.
- e) The logger must be fully programmable to log at a fixed rate or multiple logging intervals from 5 seconds to 24 hours for unattended deployment.
- f) The data logger shall preferably be provided with a ring memory (first in, first out) for buffered storage capacity of at least to 500 000 readings.
- g) The logger must have a fixed common-removable communication cable with integrated vented tube.
- h) Logger diameter must be less than 2 cm;
- i) Extras, laptop communication cable, additional cable length, operating software and spares to be listed and priced as sub items.

3.14. Multi-channel data logger with integrated sensors: pressure transducer (vented), temperature- and conductivity sensor.

3.14.1. Multi-channel data logger:

a) Data Processing: ☐

- Only intelligent data loggers, equipped with a microprocessor will be considered.
- The data logger shall be equipped with a CPU watchdog circuit that will automatically restart the system in case of a severe electrical or electromagnetic disturbance.

b) Real time clock: ☐

- The data loggers shall be equipped with battery backed hardware real time clock system.
- The real time clock system shall provide time (24-hour system) and date information and shall make provision for leap years.
- The accuracy and stability of the real time clock shall be better than ± 30 seconds per month, operating under the environmental conditions listed above in SECTION 3: STANDARD SPECIFICATIONS.

c) Memory: ☐

The data loggers shall be provided with the following types of memory systems:

- Non-volatile memory for system and station parameters and user defined variables.
- Battery backed RAM for intermediate data storage and processing. (Minimum 128 KB) Stored data at 12 minute intervals more than 2 years if not downloaded.

d) Power supply: ☐

- Each data logger shall be provided with an internal source that would prevent equipment shutdown or loss of data when the main battery is either disconnected for a short period or exchanged. (± 12 minutes)
- Power for all the sensors will be derived from the internal main battery via the data logger for more than 2 years at an interval of 12 minutes.
- The logger must have low power consumption on standby mode.
- Loggers with non-standard batteries that cannot be replaced by the operator must have a battery life of at least 5 years at an hourly logging interval under the specified operating temperatures.
- Loggers with batteries that can be replaced by the operator must have a battery life of at least 6 months at an hourly logging interval under the specified operating temperatures.
- The data logger must be reverse polarity protected.
- The logger must be programmable to log at a fixed rate or multiple logging intervals from 1 minute to 12 hours.

e) Input functions and interfacing: ☐

- The analogue input signals shall be measured to an overall accuracy of better than 0.5 to 0.1%. The input circuits shall be so designed that no errors will be introduced by ground loops.
- In order to conserve power, the data logger shall control the power supply to each sensor. Sensors shall be switched on in sequence and readings taken under processor control. Sufficient warm-up and stabilization time for sensors must be controlled by the logger.
- During non-measurement periods power supply to the sensors and signal converter units shall be interrupted for all the analogue channels.
- Full calibration procedures shall be provided for each sensor / signal conditioning unit.
- Input connectors for sensors shall be clearly labelled, shall be polarized to prevent mismatching of connectors and shall be configured so that no damage can occur if a unit is accidentally or intentionally connected to the wrong input channel. Each connector shall make provision for all the necessary signal lines, earth, 0V and 12V (switched) supplied lines.
- The data logger will feature an optional integral pressure sensor for connection to the water pressure.

f) Enclosure and Housing:

- **Only** compact data loggers will be accepted, therefore all electronic components, wiring, etc., will be fixed / mounted inside the logger housing. **No** logger will be considered should the operator need to open the housing to access the keypad, LC Display, Connectors, etc.
- The data logger shall be enclosed in wall mounted / standing enclosures, for installation in a recorder hut.
- The housing shall be manufactured of corrosion resistant material.
- The data logger / communication unit housing shall not exceed the following dimensions:
 - Height: less than 600 mm;
 - Width: less than 150 mm;
 - Depth: less than 150 mm.

g) Internal Software Requirements:

- All software packages shall be written and structured in a high level programming language. To conserve memory space, and thus power required, the use of a compiled program is recommended.
- The data logger operating software shall be located in ROM (EEPROM) and the Bidder shall be responsible for the provision of all the software required for the data logger at no additional cost.
- The data logger SOFTWARE shall allow the equipment to operate in a completely unattended mode and all reasonable precautions shall be taken in the structuring of the error trapping routines to prevent system hang-up.
- In order to conserve power, the data logger shall control the power supply to each sensor. Sensors shall be switched on in sequence and readings taken under

processor control. The logger must control sufficient warm-up and stabilisation time for sensors.

- During non-measurement periods power supply to the sensors and signal converter units shall be interrupted for all the analogue channels.
- h) Data storage:
- Data records shall contain the following information:
 - ID no, Sensor/Channel no, Time/Date and measured value.
 - The measured value shall be given in engineering units.
 - Data storage shall be done on a circulating storage system, first in - first out.
 - The memory contents must be retained for two years in the case of a power supply breakdown.
- i) Data display:
- All conversation between the data logger and the operator shall be done via the display-unit or laptop, tablet or smart device.
 - When connecting to the data logger, the following information should be displayed:
 - Measured values, Date, Time, Battery status.
 - A time-out shall be provided, so that the display will go into a sleeping mode if no keyboard activity is detected for a period.
 - The data logger display will indicate when it is busy with data transfer.
- j) Surge Protection (Accessories):
- The Bidder shall make provision for and bid separately for surge protection equipment on all system input/output circuits and power supply input (dc, mains) circuits.
 - The following equipment shall be included as an absolute minimum requirement:
 - On all analog /digital input and output circuits – DEHN BLITZDUCTORS TYPE LZ or equivalent with appropriate voltage ratings.
 - On all mains power supply circuits - DEHN type VA-280 surge arrestors or equivalent.
 - The Department may allow the use of alternative types of surge arrestors, provided that equivalent or superior protection levels will be achieved. SABS and/or CSIR test reports to substantiate claims shall be provided for the alternative offers.
 - It is not anticipated that the stated equipment will be used on its own, necessarily, provide the required level of protection and the Bidder shall implement additional measures deemed necessary to achieve the required protection level.
- k) Data acquisition:
- The data logger shall operate with a fixed interval logging sequences.
 - The operating system should allow for various measurement intervals. The

operators shall however be able to select a fixed interval for sample and storing of the data:

- Minimum sampling time of 60 seconds.

3.14.2. Pressure Transducer:



3.14.2.1. Application:

- a) The submersible pressure transducer will be used for hydrostatic water level measurement and will be measuring pressure using a vented cable.
- b) Pressure transducers must be capable of measuring water levels from 0 - 100 m, the range of each transducer being determined by the Department and pre-set in the factory. Typical ranges could be: 0 - 1 m; 0 – 2.5 m; 0 - 5 m; 0 – 10 m; 0 – 20 m, 0 – 30 m and >40 m on request.
- c) The pressure transducers must have a high reliability and ensure a large range of application for pressure measurement in all fields of water level measurement.

3.14.2.2. Design and technical details:

a) Pressure Transducer housing:

- The housing must be in an all-sealed enclosure and the pressure port must be vented to the atmosphere using a vented cable.
- The transducer housing must be robust, corrosion-resistant, insensitive to impact and vibration and watertight up to at least 70 m of water column. (>70 m on request).
- The opening to the sensor must be protected by a removable threaded cap to allow for maintenance.
- The transducer housing shall preferably not exceed the following dimensions and weight:
 - Length: 500 mm
 - Diameter: 50 mm
 - Weight: 1 kg
- The transducer housing can be fitted with a watertight plug for connection to the transducer cable.

b) Pressure sensor:

- The submersible pressure transducer sensor must be based on a piezo resistive ceramic or fully welded piezo resistive stainless steel pressure sensor element.
- The measuring cell must be chemically and thermally resistant.
- The pressure sensor must have a compensated operating temperature range of - 5°C to +70°C.
- The sensor should be calibrated, temperature compensated and provide amplified analogue output signals for 4-20mA output.
- The sensor should have a supply voltage of between 9 to 32V and must have reverse polarity protection.
- The sensor must have a response time of maximum 35ms with a power consumption not exceeding 250mW. Typical sensor warm-up time must not exceed

2 seconds.

- The sensor proof pressure must be two times the rated pressure range. Proof pressure is the maximum pressure which may be applied without causing damage to the sensing element.
- The pressure sensor must have surge immunity according to EN 61000-4-5 for current output devices with cable lengths longer than 10m.

c) Measuring Accuracy of the Pressure Transducer Sensor:

- The sensor's Non-linearity (Best Straight Line fit), hysteresis (maximum output difference at any point within the operating pressure range for increasing and decreasing pressure) and repeatability must be 0.1 % FSO (Full Scale).

d) Vented Transducer cable:

- The vented cable is factory fitted to the submersible pressure transducer housing and the length of cable for each submersible pressure transducer are being determined by the Department during procurement.
- The pressure transducer and transducer cable shall be designed to function satisfactorily with a cable length of up to 250 m.
- Flexible with Polyurethane jacketing material for corrosive media and maximum outer diameter 12 mm.
- Double sheathing with interposed tinned copper- braiding shielding with polyester with polyester film to cover the vented tube and all connectors.
- There must be filler between the conductors and vent tube and all conductors must be of tin copper.
- As the transducer cable shall be used as the carrying rope, it shall preferably feature, for longitudinal stability, an internal Kevlar core assembly, or equivalent.
- A polyamide pressure-compensation capillary tube for measuring the reference pressure, with an inside diameter of preferably 3 mm, but not less than 1,0 mm.
- End of cable connected by terminal box with hydrophobic filters and exchangeable humidity absorber.
- A fixing clamp for exact positioning of the pressure probe in a stilling well or tube must be available, manufactured of non-corrosive material.

3.14.3. Temperature sensor:

- The transducer must include an integrated temperature sensor.
- Design and technical detail:
 - Platinum resistor type.
 - Measuring range: -5°C to +40°C.
 - Resolution: 0.02°C;
 - Accuracy: ± 0.15°C.

3.14.4. Conductivity Sensor:

- The transducer must include an integrated conductivity sensor.
- Design and technical detail:
 - Measuring range: 0 µS/cm to 100,000 µS/cm (100 mS/cm).
 - Resolution: 0.5 µS / cm;
 - Accuracy: ± 0.5 % of reading.

3.15. Multi-channel data logger with integrated sensors: pressure transducer, temperature- and conductivity sensor, with built-in GPS and Bluetooth communication

3.15.1. Application:

☐

- a) The instrument will be used for live samples in dams, boreholes, rivers and estuaries.
- b) The instrument will be rugged, lightweight and easy to use.
- c) The instrument will be designed for conductivity, temperature and depth profiling using a 6 electrode conductivity cell and thermistor.
- d) The instrument will use a built-in GPS receiver for reference of time as well as location.
- e) The instrument will display immediate plots of conductivity, temperature, salinity and sound speed versus depth on the instrument's integrated colour LCD screen in the field.

3.15.2. Design and technical details:

☐

- a) The equipment shall be designed to function satisfactorily under the following conditions:
 - Temperature range:
 - Storage: -10°C to $+50^{\circ}\text{C}$;
 - Operating: -5°C to $+40^{\circ}\text{C}$
 - Conductivity:
 - Range: 0 to 100,000 $\mu\text{S} / \text{cm}$;
 - Resolution: 1 $\mu\text{S} / \text{cm}$;
 - Accuracy: $\pm 0.25\% \pm 5 \mu\text{S} / \text{cm}$
 - Pressure:
 - Range: 0 to 100dBar;
 - Resolution: 0.01 dBar;
 - Accuracy: $\pm 0.25\% \text{ FS}$.
- b) The instrument should not exceed the following dimensions and weight:
 - 250 mm Long x 100 mm High x 100 mm Deep and 1.0 kg.
- c) The data logger must be powered by commercially available user replaceable batteries and provide a minimum of 40 hours' continuous use.
- d) Built-in memory of at least 10 Mb.
- e) Rugged plastic storage/shipping case;
- f) Bluetooth dongle;
- g) Magnetic stylus pens;
- h) Cleaning tool to clean the instrument.
- i) Bluetooth class II (up to 10m range) communication protocol should be a standard feature.
- j) Point sample (moving the unit back and forth);
- k) Compatible with Windows XP/Vista/7;
- l) The data output format must be ASCII, HYPACK or MATLAB.

☐☐☐☐

3.16. Multi-channel data logger with integrated sensors: pressure transducer and water velocity measurement for use in large streams;

3.16.1. Application:

☐

- a) The data logger will be mounted on the bottom or the bank of the river, channel or canal and should make use of the “Doppler Sonar” method to determine the water velocity.
- b) The data logger will have an integrated pressure transducer to measure depths of water up to a maximum of 18 metres.

3.16.2. Design and technical details:

☐

- a) The equipment shall be designed to function satisfactorily under the following conditions:
 - Temperature range:
 - Storage: -10° C to +60° C
 - Operating: -5° C to +60° C
- b) The data logger must be powered by direct current of 12 V and have a low power consumption of less than 1 Watt.
- c) An external battery pack for autonomous operation must be offered optional.
- d) The instrument must be able to measure water velocities of up to 5 m/s with a resolution of at least 1 cm/s and an accuracy of at least 1% of the measured velocity.
- e) A RS 232 communication protocol should be a standard feature.
- f) The data logger shall have an internal memory of a minimum of 2 Mb to provide up to at least 100 000 samples.
- g) A larger memory of at least 4 Mb will be offered optional.
- h) The instrument should not exceed the following dimensions and weight:
 - 400 mm Long x 250 mm High x 200 mm Deep and 7.5 kg.
- i) The measuring unit shall have 2-beams (horizontal) for the measurement of 2D water velocities.
- j) The measuring unit shall have a measuring range of at least 2 m – 100 m.

3.17. Multi-channel data logger with integrated sensors: pressure transducer and water velocity measurement for use in medium streams;

3.17.1. Application:

☐

- a) The data logger will be mounted on the bottom or the bank of the river, channel or canal and should make use of the “Doppler Sonar” method to determine the water velocity.
- b) The data logger will have an integrated pressure transducer to measure depths of water up to a maximum of 10 metres.

3.17.2. Design and technical details:

☐

- a) The equipment shall be designed to function satisfactorily under the following conditions:
 - Temperature range:
 - Storage: -10° C to +60° C
 - Operating: -5° C to +60° C
- b) The data logger must be powered by direct current of 12 V and have a low power consumption of less than 1.0 Watt.
- c) An external battery pack for autonomous operation must be offered optional.
- d) The instrument must be able to measure water velocities of up to 5 m/s with a resolution of at least 1 cm/s and an accuracy of at least 1% of the measured velocity.
- e) A RS 232 communication protocol should be a standard feature.
- f) The data logger shall have an internal memory of a minimum of 2 Mb to provide up to at least 100 000 samples.
- g) A larger memory of at least 4 Mb will be offered optional.
- h) The instrument should not exceed the following dimensions and weight:
 - 300 mm Long x 200 mm High x 100 mm Deep and 3 kg.
- i) The measuring unit shall have 2-beams (horizontal) for the measurement of 2D water velocities.
- j) The measuring unit shall have a measuring range of at least 0.5 m – 15 m.

3.18. Multi-channel data logger with integrated sensors: pressure transducer and water velocity measurement for use in small streams;

3.18.1. Application:



- a) The data logger will be mounted on the bottom or the bank of the river, channel or canal and should make use of the “Doppler Sonar” method to determine the water velocity.
- b) The data logger will have an integrated pressure transducer to measure depths of water up to a maximum of 5 metres.

3.18.2. Design and technical details:



- a) The equipment shall be designed to function satisfactorily under the following conditions:
 - Temperature range:
 - Storage: -10° C to +60° C
 - Operating: -5° C to +60° C
- b) The data logger must be powered by direct current of 12 V and have a low power consumption of less than 1.0 Watt.
- c) An external battery pack for autonomous operation must be offered optional.
- d) The instrument must be able to measure water velocities of up to 5 m/s with a resolution of at least 1 cm/s and an accuracy of at least 1% of the measured velocity.
- e) A RS 232 communication protocol should be a standard feature.
- f) The data logger shall have an internal memory of a minimum of 2 Mb to provide up to at least 100 000 samples.
- g) A larger memory of at least 4 Mb will be offered optional.
- h) The instrument should not exceed the following dimensions and weight:
 - 300 mm Long x 250 mm High x 75 mm Deep and 3 kg.
- i) The measuring unit shall have 2-beams (horizontal) for the measurement of 2D water velocities.
- j) The measuring unit shall have a measuring range of at least 0.2 m – 10 m.

3.19. Multi-channel data logger with integrated sensors: pressure transducer and water velocity measurement for use in shallow streams;

3.19.1. Application:

☐

- a) The data logger will be mounted on the bottom or the bank of the river, channel or canal and should make use of the “Doppler Sonar” method to determine the water velocity.
- b) The data logger will have an integrated pressure transducer to measure depths of water between 0.250 m and 5.000 m.

3.19.2. Design and technical details:

☐

- a) The equipment shall be designed to function satisfactorily under the following conditions:
 - Temperature range:
 - Storage: -10° C to +60° C
 - Operating: -5° C to +60° C
- b) The data logger must be powered by direct current of 12 V and have a low power consumption of less than 1.0 Watt.
- c) An external battery pack for autonomous operation must be offered optional.
- d) The instrument must be able to measure water velocities of up to 5 m/s with a resolution of at least 1 cm/s and an accuracy of at least 1% of the measured velocity.
- e) A RS 232 communication protocol should be a standard feature.
- f) An optional flow display must be offered.
- g) The data logger shall have an internal memory of a minimum of 3 Mb to provide up to at least 50 000 samples.
- h) The instrument should not exceed the following dimensions and weight:
 - 250 mm Long x 100 mm High x 75 mm Deep and 1.5 kg.
- i) The measuring unit shall have 2-beams (horizontal) for the measurement of 2D water velocities.
- j) The measuring unit shall have a measuring range of at least 0.3 m – 5 m.

3.20. Multi-channel data logger with integrated sensors: weather parameters;

3.20.1. Application:

- a) This system will consist of a LC Console / Receiver for readings and a separate integrated sensor suite measuring the weather parameters outdoors. ☐
- b) A Data Logger with application software and connection cables will also be offered. ☐
- c) Adequate surge protection will be offered with this equipment.

3.20.2. Design and technical details of Console and Data Logger:

- a) The equipment shall be designed to function satisfactorily under the following conditions:
 - Temperature range: ☐
 - Storage: -10° C to +60° C
 - Operating: -10° C to +70° C
 - Relative humidity: 30% to 95%, Condensing ☐
 - Elevation: 0 - 3 500 m above sea level ☐
- b) The Console will have the following approximate dimensions: 250 mm Long x 150 mm High x 40 mm Deep/Thick with a backlit LC Display of at least 150 x 90 mm. ☐
- c) The Console will operate with AC power as standard but should also be able to be operated by commercially available dry alkaline batteries during power failures. ☐
- d) As standard this system will communicate (from the sensors to the console) via a cable of at least 30 m long with an option to order longer lengths.
- e) A wireless system with a transmitter and transceiver, capable of communicating at least 100 m, (Line of Sight) will be offered as an option.
- f) The following parameters/features should be able to be viewed on the LC Display of the Console:
 - Compass Rose to view wind direction or wind speed. ☐
 - Scalable Graph to view the latest trends of all measured parameters. ☐
 - Time & Date. ☐
 - Fixed Display area showing the most important weather variables at all times. ☐
 - View Daily Rainfall or Rainfall for a specific storm/period.
 - View Monthly or Annual Rainfall, Rain Rate, Evapo-transpiration or Rate of Solar Radiation ☐
- g) The data logger shall also be equipped with an easy accessible RS 232 interface for data transmission via a communication facility (Telephone line, Cellular telephone link, Satellite Transmitter or Satellite telephone link) ☐
- h) The data logger shall have a user-selectable storage interval, typical 1, 5, 10, 15, 30, 60 or 120 minutes.
- i) The Application Software will have the following minimum facilities:

- View all the current conditions immediately.
 - View Graphs on a daily, weekly, monthly or yearly basis.
 - View multiple weather variables at the same time to see their relationship.
 - Be able to create your own reports
- j) Additional Console/Receivers to view data in more than one location should be offered additional. ☐

3.20.3. Design and technical details of Integrated Sensor Suite:

- a) The following minimum sensors will be offered standard with the following accuracy, resolution and range:

- Time:
 - Resolution: 1 minute
 - Range: 24 hours
 - Accuracy: 8 seconds/month☐
- Date:
 - Resolution: day/month
 - Accuracy: 8 seconds/month☐
- Sunrise & Sunset:
 - Resolution: 1 minute☐
- Tipping Bucket Rain Gauge:
 - Resolution: 0.2 mm
 - Range: Day: 0 to 9999 mm
 - Month: 0 to 19.999 mm
 - Year: 0 to 19.999 mm
 - Accuracy: 5 %☐
- Rainfall Intensity:
 - Resolution: 0.1 mm
 - Range: 0 to 1999.9 mm/hour
 - Accuracy: 5 %☐
- Wind Direction:
 - Resolution: 1°
 - Range: 0° – 360°
 - Accuracy: 4°☐
- Compass Rose:
 - Resolution: 22.5°
 - Range: 16 Compass Points
 - Accuracy: 4°☐
- Wind Speed:
 - Resolution: 0.1 m/s or 1 km/hr
 - Range: 1 – 67 m/s or 3 – 241 km/hr
 - Accuracy: 5%☐
- Direction of High Speed:
 - Resolution: 22.5°
 - Range: 16 Compass Points☐

- Accuracy: 4°
- Inside Humidity:
 - Resolution: 1%
 - Range: 10% – 90%
 - Accuracy: 5%☐
- Outside Humidity:
 - Resolution: 1%
 - Range: 0% - 100%
 - Accuracy: 3%☐
- Dew Point:
 - Resolution: 1°C
 - Range: -76° to +54°C
 - Accuracy: 1.5°C☐
- Inside Temperature:
 - Resolution: 0.1°C
 - Range: 0° – 60°C
 - Accuracy: 0.5°C☐
- Outside Temperature:
 - Resolution: 1°C
 - Range: -40° to +65°C
 - Accuracy: 0.5°C☐
- Soil or Water Temperature:
 - Resolution: 1°C
 - Range: -40° to +65°C
 - Accuracy: 0.5°C☐
- Outside Temperature / Humidity Index:
 - Resolution: 1°C
 - Range: -40° to +57°C
 - Accuracy: 1.5°C☐
- Temperature / Humidity / Sun / Wind Index:
 - Resolution: 1°C
 - Range: -68° to +64°C
 - Accuracy: 2°C☐
- Wind Chill:
 - Resolution: 1°C
 - Range: -79° to +54°C
 - Accuracy: 1°C☐
- b) The following additional sensors will be offered with the following accuracy, resolution and range:
- Barometric Pressure:
 - Resolution: 0.1mm Hg
 - Range: 660 to 810 mm Hg
 - Accuracy: 0.8 mm Hg☐
- Solar Radiation:

- Resolution: 1 W/m²
- Range: 0 – 1 800 W/m²
- Accuracy: 5%
- Solar Energy:
 - Resolution: 0.1 Ly
 - Range: 1 999.9 Ly
 - Accuracy: 5%
- UV Dose:
 - Resolution: 0.1 MED's
 - Range: 0 – 199 MED's
 - Accuracy: 5%
- UV Index:
 - Resolution: 0.1
 - Range: 0 - 16
 - Accuracy: 5%
- Agricultural: Evapotranspiration:
 - Resolution: 0.1 mm
 - Range: Day: To 999.9 mm
 - Month: To 1 999.9 mm
 - Year: To 1 999.9 mm
 - Accuracy: 5%
- Growing Degree-Days:
 - Resolution: 0.1 Degree-Day
 - Range: Unlimited
- Leaf Wetness:
 - Resolution: 1
 - Range: 0 – 15
 - Accuracy: 0.5
- Soil Moisture:
 - Resolution: 1 cb
 - Range: 0 – 200 cb

3.21. Multi-channel data logger for external sensors: 4-20 mA (vented pressure transducer) and digital pulse (rainfall); Submersible with internal battery and internal GSM modem;

3.21.1. Application:

☐

- a) The submersible multi-channel GSM data logging system would be installed at remote gauging stations and used for primary or secondary real-time or backup data collection applications where water levels and rainfall is measured.

3.21.2. Design and technical details:

☐

- a) The equipment shall be designed to function satisfactorily under the following conditions:
- Operating temperature range: -20°C to 50°C;
 - Relative humidity: 100%;
 - Submersible: IP67 (or higher):
 - Solid particle protection: Dust tight; and
 - Liquid ingress protection: Immersion, up to 1-meter depth for 30 minutes;

3.21.3. Multi-channel data logger:

☐

a) Data Processing:

- Only intelligent data loggers, equipped with a microprocessor will be considered.
- The data logger shall be equipped with a CPU watchdog circuit that will automatically restart the system in case of a severe electrical or electromagnetic disturbance.
- The multi-channel GSM data logger must have at least eight channels that can be user configurable to simultaneously record 4-20mA inputs from water level sensors, digital pulse inputs from tipping bucket rain gauges and internal battery voltage of the data logger.
- Build options for up to two pressure, eight (user programmable) digital or analogue inputs and two individually switched 12 Volt outputs for powering 4-20mA loop.
- High frequency pressure transient detection critical to extending asset life and network modelling.
- Facilitates closed loop control of pressure reducing valves, pressure sustaining valves and variable speed pumps.
- Integral movement detection aiding preventative maintenance routines, asset tracking and enhanced data integrity critical for reporting.

b) Real time clock:

☐

- The data loggers shall be equipped with battery backed hardware real time clock system.
- The real time clock system shall provide time (24-hour system) and date information.
- Crystal controlled calendar clock with leap year adjustment Option to synchronise clock to local network at regular intervals

c) Memory:

☐

The data loggers shall be provided with the following types of memory systems:

- Solid state, non-volatile memory for system and station parameters and user defined variables allocable between channels as required (max 64K per channel).
- The memory size: 512K.
- Recording Interval programmable between 1 second and 1-hour.
- Data storage: Rotating store or store until full.
- Supports average and statistical recording of pressure (min, max, mean, standard deviation) over logging interval.
- Battery backed RAM for intermediate data storage and processing. (Minimum 128 KB) Stored data at 12 minute intervals more than 2 years if not downloaded.

d) Power supply:

☐

- Each data logger shall be provided with an internal source that would prevent equipment shutdown or loss of data when the main battery is either disconnected for a short period or exchanged. (± 12 minutes)
- Power for all the sensors will be derived from the internal main battery via the data logger for more than 2 years at an interval of 12 minutes.
- The logger must have low power consumption on standby mode.
- The user replaceable internal battery must have a battery life of at least 5 years at an hourly logging interval under the specified operating temperatures.
- Optional: high capacity external lithium battery pack, user replaceable.
- The logger should be fitted with an external power input connector where external DC voltage can be supplied if required;
- The data logger must be reverse polarity protected.
- The logger must be programmable to log at a fixed rate or multiple logging intervals from 1 minute to 12 hours.
- High accuracy battery monitoring optimising maintenance and asset management programmes.

e) Input functions and interfacing:

☐

- Programmable Input range:
 - 0 - 100m (0 - 10 bar); or
 - 0 - 200m (0 - 20 bar):
- Resolution:
 - $\pm 0.5\%$ or $\pm 0.1\%$.
- In order to conserve power, the data logger shall control the power supply to each sensor. Sensors shall be switched on in sequence and readings taken under processor control. Sufficient warm-up and stabilization time for sensors must be controlled by the logger.
- During non-measurement periods power supply to the sensors and signal converter units shall be interrupted for all the analogue channels.
- Full calibration procedures shall be provided for each sensor / signal conditioning unit.

- Input connectors for sensors shall be clearly labelled, shall be polarized to prevent mismatching of connectors and shall be configured so that no damage can occur if a unit is accidentally or intentionally connected to the wrong input channel. Each connector shall make provision for all the necessary signal lines, earth, 0V and 12V (switched) supplied lines.
- The data logger will feature an optional integral pressure sensor for connection to the water pressure.

f) Enclosure and Housing:

☐

- **Only** compact data loggers will be accepted, therefore all electronic components, wiring, etc., will be fixed / mounted inside the logger housing. **No** logger will be considered should the operator need to open the housing to access the keypad, LC Display, Connectors, etc.
- The data logger shall be enclosed in wall mounted / standing enclosures, for installation in a recorder hut.
- The data logger shall be designed to operate without degradation under dusty or condensing conditions experienced at sites.
- The housing shall be manufactured of corrosion resistant material.
- The data logger / communication unit housing shall not exceed the following dimensions:
 - Height: less than 150 mm;
 - Width: less than 150 mm;
 - Depth: less than 150 mm.
- The data logger will feature a local full duplex serial communication port for programming the data logger, and for manual downloading of data. ☐ The data-logger local communication port should operate at an asynchronous data rate of between 1200 to 38400 Bps.
- Proven bidirectional communication with automatic gap filling ensuring high level data reliability and supporting remote product configuration

3.21.4. Transmission:

3.21.4.1. GSM Modem

☐

- The data logger shall incorporate a built-in GSM Modem for the purpose of transmitting and receiving data to and from the network.
- The GSM modem shall be a scalable machine to machine (M2M) solution reducing user operating and capital costs.
- The GSM modem shall be easily set-up using innovative optional Wi-Fi communication interface.

3.21.4.2. GSM Modem Frequency Band

- The GSM Modem shall be dual band and should be capable of operating at frequencies of 900 MHz/1800 MHz or 850 Hz/1900 MHz. ☐

3.21.4.3. GSM Modem Antenna:

- The GSM antenna shall be integral to the data logger.
- An external SMA connector must be available for attaching an optional external GSM antenna to the logger to support 2G or 3G frequencies.

☐

3.21.4.4. SIM Card Compatibility and Replacement:

- The data logger will permit the fitting and replacement of the SIM card by the user. It should support all current forms of SIM cards in common use by GSM operators.

3.21.4.5. Signal Strength Measurement:

- To carry out an installation, the installer will be required to measure the signal strength from the various operators with the product mounted in-situ. In the case of underground locations, this will involve placing the data logger in its anticipated position and measure signal strength with the chamber covers replaced, or in anticipated position in a basement.
- The data logger should therefore have a facility to carry out the unattended recording of signal strength. Subsequent downloading and analysis of the signal strength data then reveals the adequacy of the mounting position, the choice of provider and so on.

3.21.4.6. Choice of Operator:

- The data logger will operate with any of the GSM operators' networks.

☐

3.21.4.7. Transmission of Data:

- Remote set-up compatibility monitoring and control through locally deployed PMAC software in use by the Hydrology Section for the last 10 years
- The data logger will be programmed to initiate data transmission hourly, daily, weekly or monthly at a user selected time. The logger will assemble the data to be transmitted in the form of packets of suitable length and format to be transmitted as a number of SMS's.
- Data to be transmitted will be any data, which has not been previously sent, or, at the request of the data centre any data recorded from a particular date and time.
- Advanced channel profile and threshold alarms.
- High frequency pressure transient detection critical to extending asset life and network modelling.
-

3.22. Multi-channel data logger for external sensors: multiple; with data transmission capabilities;

3.22.1. Application:

- a) The multi-channel data logging system would be installed at remote gauging stations and used for primary or secondary real-time or backup data collection applications where water levels and rainfall is measured.
- b) The bidder shall make provision for equipment with optional GSM and / or satellite data transmission.

☐

3.22.2. Design and technical details:



b) The equipment shall be designed to function satisfactorily under the following conditions:

- Operating temperature range: -20°C to 50°C;
- Relative humidity: 100%;
- Submersible: IP64 (or higher):
 - Solid particle protection: Dust tight; and
 - Liquid ingress protection: Splashing of water.

3.22.3. Multi-channel data logger:



a) Data Processing:

- Only intelligent data loggers, equipped with a microprocessor will be considered.
- The data logger shall be equipped with a CPU watchdog circuit that will automatically restart the system in case of a severe electrical or electromagnetic disturbance.
- The multi-channel data logger must have at least eight channels that can be user configurable to simultaneously record 4-20mA inputs from water level sensors, digital pulse inputs from tipping bucket rain gauges and internal battery voltage of the data logger.
- Build options for up to two pressure, eight (user programmable) digital or analogue inputs and two individually switched 12 Volt outputs for powering 4-20mA loop.

b) Real time clock:



- The data loggers shall be equipped with battery backed hardware real time clock system.
- The real time clock system shall provide time (24-hour system) and date information.
- Crystal controlled calendar clock with leap year adjustment Option to synchronise clock to local network at regular intervals

c) Memory:



The data loggers shall be provided with the following types of memory systems:

- Solid state, non-volatile memory for system and station parameters and user defined variables allocable between channels as required (max 64K per channel).
- The memory size: 512K.
- Recording Interval programmable between 1 second and 1-hour.
- Data storage: Rotating store or store until full.
- Supports average and statistical recording of pressure (min, max, mean, standard deviation) over logging interval.
- Battery backed RAM for intermediate data storage and processing. (Minimum 128 KB) Stored data at 12 minute intervals more than 2 years if not downloaded.

- d) Power supply: ☐
- Each data logger shall be provided with an internal source that would prevent equipment shutdown or loss of data when the main battery is either disconnected for a short period or exchanged. (± 12 minutes)
 - The logger must have low power consumption on standby mode.
 - The logger should be fitted with an external power input connector where external DC voltage can be supplied if required;
 - The data logger must be reverse polarity protected.
 - The logger must be programmable to log at a fixed rate or multiple logging intervals from 1 minute to 12 hours.
 - High accuracy battery monitoring optimising maintenance and asset management programmes.
- e) Input functions and interfacing: ☐
- Programmable Input range:
 - 0 - 100m (0 - 10 bar); or
 - 0 - 200m (0 - 20 bar):
 - Resolution:
 - $\pm 0.5\%$ or $\pm 0.1\%$.
 - In order to conserve power, the data logger shall control the power supply to each sensor. Sensors shall be switched on in sequence and readings taken under processor control. Sufficient warm-up and stabilization time for sensors must be controlled by the logger.
 - During non-measurement periods power supply to the sensors and signal converter units shall be interrupted for all the analogue channels.
 - Full calibration procedures shall be provided for each sensor / signal conditioning unit.
 - Input connectors for sensors shall be clearly labelled, shall be polarized to prevent mismatching of connectors and shall be configured so that no damage can occur if a unit is accidentally or intentionally connected to the wrong input channel. Each connector shall make provision for all the necessary signal lines, earth, 0V and 12V (switched) supplied lines.
- f) Enclosure and Housing: ☐
- **Only** compact data loggers will be accepted, therefore all electronic components, wiring, etc., will be fixed / mounted inside the logger housing. **No** logger will be considered should the operator need to open the housing to access the keypad, LC Display, Connectors, etc.
 - The data logger shall be enclosed in wall mounted / standing enclosures, for installation in a recorder hut.
 - The data logger shall be designed to operate without degradation under dusty or condensing conditions experienced at sites.
 - The housing shall be manufactured of corrosion resistant material.
 - The data logger / communication unit housing shall not exceed the following

dimensions:

- Height: less than 150 mm;
 - Width: less than 150 mm;
 - Depth: less than 150 mm.
- The data logger will feature a local full duplex serial communication port for programming the data logger, and for manual downloading of data. The data-logger local communication port should operate at an asynchronous data rate of between 1200 to 38400 Bps.
 - Proven bidirectional communication with automatic gap filling ensuring high level data reliability and supporting remote product configuration.
 - Provision should be made for external connection to transmission equipment (GSM- or Satellite modem).

4. INTEGRATED DATA LOGGER WITH REMOVABLE WATER QUALITY SENSORS:

4.1. Multi-Parameter Water Quality Sonde with pH-, Electrical Conductivity-, Temperature-, Depth and Optical Oxygen Sensors (Bluetooth Communication Capability) – Diameter Less Than Five Centimetres;

4.1.1. Application:

- a) This sonde will be used for water quality depth profiling and permanent deployment in boreholes, rivers, estuaries or dams.



4.1.2. Design and technical details:

- a) Bluetooth and SDI 12 communication to android handheld device must be a standard internal function with no external adaptor devices required.;
- b) The sonde must have a minimum immersion depth of 145m;
- c) The pH sensor must have a replaceable junction and reference electrolyte for maintenance purposes.
- d) Must display pH millivolt during calibration.
- e) Must have internal memory of at least 10mb and include a user replaceable SD card;
- f) The sonde main body must contain a battery compartment and be fully programmable for unattended deployment with no cables attached;
- g) Sonde diameter must be less than 5cm;
- b) A removable fixed central sensor wiper must be included as standard;
- c) The sonde main body will be offered as standard with a pH sensor, optical do sensor, temperature sensor, electrical conductivity sensor, operating software.
- h) Extras, spares and additional cable lengths to be listed and priced as sub items

4.2. Deep Water (Minimum 245m) Multi-Parameter Water Quality Sonde with Optical and Smart Sensor Technology - Diameter Less Than Five Centimetres;

4.2.1. Application:

- a) This sonde will be used for water quality depth profiling and permanent deployment in deep boreholes, rivers, estuaries or dams. ☐

4.2.2. Design and technical details:

- a) All calibration data must be stored on individual smart sensors; ☐
- b) The sonde must have a minimum immersion depth of 245m; ☐
- c) Must display pH millivolt during calibration. ☐
- d) The sonde must have on-board memory to store at least 500 000 readings;
- e) The sonde main body must contain a battery compartment and be fully programmable for unattended deployment with no cables attached;
- f) The sonde diameter must be less than 5cm;
- g) This sonde will be offered standard with sonde main body, depth sensor, pH sensor, optical DO sensor, temperature sensor, electrical conductivity sensor, operating software.
- h) This sonde will be offered standard with sonde main body, pH sensor, optical do sensor, temperature sensor, electrical conductivity sensor, operating software.
- i)
- j) Bluetooth communication is not a requirement, however all cables and connectors required to setup or calibrate this instrument from a laptop or smart device must be included.
- k) Extras, spares and additional cable lengths to be listed and priced as sub items

4.3. Deep Water (Minimum 245m) Multi-Parameter Water Quality Sonde with Optical and Smart Sensor Technology - Diameter Less Than Nine Centimetres;

4.3.1. Application:

- b) This sonde will be used for water quality depth profiling and permanent deployment in deep boreholes, rivers, estuaries or dams.

4.3.2. Design and technical details:

- l) All calibration data must be stored on individual smart sensors;
- m) The sonde must have a minimum immersion depth of 245m;
- n) Must display pH millivolt during calibration.
- o) The sonde must have on-board memory to store at least 500 000 readings;
- p) The sonde main body must contain a battery compartment and be fully programmable for unattended deployment with no cables attached;
- q) The sonde diameter must be less than 9cm;
- r) This sonde will be offered standard with sonde main body, depth sensor, pH sensor, optical DO sensor, temperature sensor, electrical conductivity sensor, operating software.
- s) This sonde must have at least 6 sensor ports to accommodate a range of removable sensors (not including the depth sensor or removable wiper).

- t) This sonde must include a central wiper as standard.
- u) Bluetooth communication is not a requirement, however all cables and connectors required to setup or calibrate this instrument from a laptop or smart device must be included.
- v) Extras, spares and additional cable lengths to be listed and priced as sub items.

5. HANDHELD WATER QUALITY DEVICES

5.1. Multi-Parameter Handheld Water Quality System (with pH-, Dissolved Oxygen-, Electrical Conductivity- and Temperature Sensor);

5.1.1. Application:

- a) This multi-parameter handheld meter will be used for ad hoc field measurements by water quality samplers

5.1.2. Design and technical details:



- a) Must display pH millivolt during calibration;
- b) Must have a screw-on oxygen membrane cap (no O-ring or optical sensor);
- c) Must report on salinity in terms of the practical salinity scale
- d) Sensor bulkhead guard must be weighted for stability;
- e) Display to be connected to sensors via cable;
- f) The display must come standard with dedicated rechargeable lithium-ion battery. Additional AC and USB power inputs are a requirement
- g) No depth sensor required.
- h) The maximum available cable length may not be less than 30 metres.
- i) This multi-parameter handheld system must include as standard a sensor bulkhead, 10m cable, display unit with barometer, laptop communication cable, serial to USB port converter (if necessary), pH sensor, oxygen sensor, electrical conductivity sensor, temperature sensor and protective carry case.
- j) Extras, spares and additional cable lengths to be listed and priced as sub items

5.2. Multi-parameter handheld water quality system (with pH-, dissolved oxygen-, electrical conductivity- and temperature sensor) with wireless smart device display capability:

5.2.1. Application:

- a) This multi-parameter system will be used for ad hoc field measurements by water quality samplers. This water quality meter does not include a display device and must communicate directly to the field workers' personal android device.

5.2.2. Design and technical requirements:

- a) Must have an optical oxygen sensor;
- b) Must have a water level sensor;
- c) Must display pH mv during calibration
- d) The pH sensor must have a replaceable junction for maintenance purposes.
- e) Must report on salinity in terms of the practical salinity scale;
- f) Must have built-in Bluetooth communication to android handheld display device;
- g) The android display device (cell phone or tablet) is not included.
- h) Communication to handheld device via cable may not be an option;
- i) Maximum cable length must be more than 70m for deep profiling;
- j) This multi-parameter system must include as standard a sensor bulkhead, 8-10m cable, battery pack, pH sensor, optical oxygen sensor, electrical conductivity sensor, temperature sensor and level sensor.
- k) Extras, spares and additional cable lengths to be listed and priced as sub items.

6. SENSORS

6.1. Sensor for Water Level Measurement: Shaft Encoder.

6.1.1. Application:



- a) The shaft encoder will operate with a float and counterweight system.
- b) The shaft encoder must preferably have a standard resolution of 1 mm and must preferably be capable of measuring water levels from 0 - 19,999 m (mm resolution) and 0-199,99 m (cm resolution). Desired resolution must be able to be scaled by the user.

6.1.2. Design and technical details:

- a) The shaft encoder must be compact, robust and corrosion-resistant.
- b) The shaft encoder unit must have an output, so that it could be connected directly to one of the data loggers.
- c) the sense of rotation must be able to be selected by the user for left- or right hand rising.
- d) The shaft encoder must be able to process an extremely high rotation speed. At least 1m rise or fall in 20 seconds, or better.
- e) The pulley of the shaft encoder must be able to accommodate 1 mm Ø float cable.
- f) The float cable must not slip on the encoder pulley.
- g) A corrosion-resistant bracket for stand-alone operation must be available.

6.2. Sensor for Water Level Measurement: Pressure Transducer: Piezo resistive sensor (Stainless Steel) with 4-20mA output.

6.2.1. Application



- a) The submersible pressure transducer will be used for hydrostatic water level measurement and will be measuring pressure using a vented cable.
- b) Pressure transducers must be capable of measuring water levels from 0 - 100 m, the range of each transducer being determined by the Department and pre-set in the factory. Typical ranges could be: 0 - 1 m; 0 – 2.5 m; 0 - 5 m; 0 – 10 m; 0 – 20 m, 0 – 30 m and >40 m on request.
- c) The pressure transducers must have a high reliability and ensure a large range of application for pressure measurement in all fields of water level measurement.

6.2.2. Design and Technical Details:



- a) Pressure Transducer housing:
 - The housing must be in an all-sealed enclosure and the pressure port must be vented to the atmosphere using a vented cable.
 - The transducer housing must be robust, corrosion-resistant, insensitive to impact and vibration and watertight up to at least 70 m of water column. (>70 m on request).
 - The opening to the sensor must be protected by a removable threaded cap to allow for maintenance.
 - The transducer housing shall preferably not exceed the following dimensions and weight:
 - Length: 500 mm
 - Diameter: 50 mm
 - Weight: 1 kg
 -
 - The transducer housing can be fitted with a watertight plug for connection to the transducer cable.
- b) Pressure Transducer sensor:

☐

 - The submersible pressure transducer sensor must be based on a fully welded piezo resistive stainless steel pressure sensor element.
 - The measuring cell must be chemically and thermally resistant.
 - The pressure sensor must have a compensated operating temperature range of - 5°C to +70°C.
 - The sensor should be calibrated; temperature compensated and provide amplified analogue output signals for 4-20mA output.
 - The sensor should have a supply voltage of between 9 to 32V and must have reverse polarity protection.
 - The sensor must have a response time of maximum 35 ms with a power consumption not exceeding 250mW. Typical sensor warm-up time must not exceed

2 seconds.

- The sensor proof pressure must be two times the rated pressure range. Proof pressure is the maximum pressure which may be applied without causing damage to the sensing element.
- The pressure sensor must have surge immunity according to EN 61000-4-5 for current output devices with cable lengths longer than 10m.

c) Measuring Accuracy of the Pressure Transducer Sensor:

- The sensor's Non-linearity (Best Straight Line fit), hysteresis (maximum output difference at any point within the operating pressure range for increasing and decreasing pressure) and repeatability must be 0.1 % FSO (Full Scale).

d) Vented transducer cable:



- The vented cable is factory fitted to the submersible pressure transducer housing and the length of cable for each submersible pressure transducer are being determined by the Department during procurement.
- The pressure transducer and transducer cable shall be designed to function satisfactorily with a cable length of up to 250 m.
- Flexible with Polyurethane jacketing material for corrosive media and maximum outer diameter 12 mm.
- Double sheathing with interposed tinned copper- braiding shielding with polyester with polyester film to cover the vented tube and all connectors.
- There must be filler between the conductors and vent tube and all conductors must be of tin copper.
- As the transducer cable shall be used as the carrying rope, it shall preferably feature, for longitudinal stability, an internal kevlar core assembly, or equivalent.
- A polyamide pressure-compensation capillary tube for measuring the reference pressure, with an inside diameter of preferably 3 mm, but not less than 1,0 mm.
- End of cable connected by terminal box with hydrophobic filters and exchangeable humidity absorber.
- A fixing clamp for exact positioning of the pressure probe in a stilling well or tube must be available, manufactured of non-corrosive material.

6.3. Sensor for Water Level Measurement: Pressure Transducer: Piezo resistive sensor (Ceramic) with 4-20mA output.

6.3.1. Application



- a) The submersible pressure transducer will be used for hydrostatic water level measurement and will be measuring pressure using a vented cable.
- b) Pressure transducers must be capable of measuring water levels from 0 - 100 m, the range of each transducer being determined by the Department and pre-set in the factory. Typical ranges could be: 0 - 1 m; 0 – 2.5 m; 0 - 5 m; 0 – 10 m; 0 – 20 m, 0 – 30 m and >40 m on request.
- c) The pressure transducers must have a high reliability and ensure a large range of application for pressure measurement in all fields of water level measurement.

6.3.2. Design and Technical Details:



- a) Pressure Transducer housing:
 - The housing must be in an all-sealed enclosure and the pressure port must be vented to the atmosphere using a vented cable.
 - The transducer housing must be robust, corrosion-resistant, insensitive to impact and vibration and watertight up to at least 70 m of water column. (>70 m on request).
 - The opening to the sensor must be protected by a removable threaded cap to allow for maintenance.
 - The transducer housing shall preferably not exceed the following dimensions and weight:
 - Length: 500 mm
 - Diameter: 50 mm
 - Weight: 1 kg
 -
 - The transducer housing can be fitted with a watertight plug for connection to the transducer cable.
- b) Pressure Transducer sensor:
 - The submersible pressure transducer sensor must be based on a piezo-resistive ceramic pressure sensor element.
 - The measuring cell must be chemically and thermally resistant.
 - The pressure sensor must have a compensated operating temperature range of - 5°C to +70°C.
 - The sensor should be calibrated, temperature compensated and provide amplified analogue output signals for 4-20mA output.
 - The sensor should have a supply voltage of between 9 to 32V and must have reverse polarity protection.
 - The sensor must have a response time of maximum 35 ms with a power consumption not exceeding 250mW. Typical sensor warm-up time must not exceed



2 seconds.

- The sensor proof pressure must be two times the rated pressure range. Proof pressure is the maximum pressure which may be applied without causing damage to the sensing element.
- The pressure sensor must have surge immunity according to EN 61000-4-5 for current output devices with cable lengths longer than 10m.

c) Measuring Accuracy of the Pressure Transducer Sensor:

- The sensor's Non-linearity (Best Straight Line fit), hysteresis (maximum output difference at any point within the operating pressure range for increasing and decreasing pressure) and repeatability must be 0.1 % FSO (Full Scale).

d) Vented transducer cable:



- The vented cable is factory fitted to the submersible pressure transducer housing and the length of cable for each submersible pressure transducer are being determined by the Department during procurement.
- The pressure transducer and transducer cable shall be designed to function satisfactorily with a cable length of up to 250 m.
- Flexible with Polyurethane jacketing material for corrosive media and maximum outer diameter 12 mm.
- Double sheathing with interposed tinned copper- braiding shielding with polyester with polyester film to cover the vented tube and all connectors.
- There must be filler between the conductors and vent tube and all conductors must be of tin copper.
- As the transducer cable shall be used as the carrying rope, it shall preferably feature, for longitudinal stability, an internal Kevlar core assembly, or equivalent.
- A polyamide pressure-compensation capillary tube for measuring the reference pressure, with an inside diameter of preferably 3 mm, but not less than 1,0 mm.
- End of cable connected by terminal box with hydrophobic filters and exchangeable humidity absorber.
- A fixing clamp for exact positioning of the pressure probe in a stilling well or tube must be available, manufactured of non-corrosive material.

6.4. Sensor for Water Level Measurement: Pressure Transducer: Piezo resistive sensor (Stainless Steel) with SDI12 output.

6.4.1. Application



- a) The submersible pressure transducer will be used for hydrostatic water level measurement and will be measuring pressure using a vented cable.
- b) Pressure transducers must be capable of measuring water levels from 0 - 100 m, the range of each transducer being determined by the Department and pre-set in the factory. Typical ranges could be: 0 - 1 m; 0 – 2.5 m; 0 - 5 m; 0 – 10 m; 0 – 20 m, 0 – 30 m and >40 m on request.
- c) The pressure transducers must have a high reliability and ensure a large range of application for pressure measurement in all fields of water level measurement.

6.4.2. Design and Technical Details:



- a) Pressure Transducer housing:
 - The housing must be in an all-sealed enclosure and the pressure port must be vented to the atmosphere using a vented cable.
 - The transducer housing must be robust, corrosion-resistant, insensitive to impact and vibration and watertight up to at least 70 m of water column. (>70 m on request).
 - The opening to the sensor must be protected by a removable threaded cap to allow for maintenance.
 - The transducer housing shall preferably not exceed the following dimensions and weight:
 - Length: 500 mm
 - Diameter: 50 mm
 - Weight: 1 kg
 -
 - The transducer housing can be fitted with a watertight plug for connection to the transducer cable.
- b) Pressure Transducer sensor:

☐

 - The submersible pressure transducer sensor must be based on a fully welded piezo resistive stainless steel pressure sensor element.
 - The measuring cell must be chemically and thermally resistant.
 - The pressure sensor must have a compensated operating temperature range of - 5°C to +70°C.
 - The sensor should be calibrated, temperature compensated and provide amplified analogue output signals for SDI12 output.
 - The sensor should have a supply voltage of between 9 to 32V and must have reverse polarity protection.
 - The sensor must have a response time of maximum 35 ms with a power consumption not exceeding 250mW. Typical sensor warm-up time must not exceed

2 seconds.

- The sensor proof pressure must be two times the rated pressure range. Proof pressure is the maximum pressure which may be applied without causing damage to the sensing element.
- The pressure sensor must have surge immunity according to EN 61000-4-5 for current output devices with cable lengths longer than 10m.

c) Measuring Accuracy of the Pressure Transducer Sensor:

- The sensor's Non-linearity (Best Straight Line fit), hysteresis (maximum output difference at any point within the operating pressure range for increasing and decreasing pressure) and repeatability must be 0.1 % FSO (Full Scale).

d) Vented transducer cable:



- The vented cable is factory fitted to the submersible pressure transducer housing and the length of cable for each submersible pressure transducer are being determined by the Department during procurement.
- The pressure transducer and transducer cable shall be designed to function satisfactorily with a cable length of up to 250 m.
- Flexible with Polyurethane jacketing material for corrosive media and maximum outer diameter 12 mm.
- Double sheathing with interposed tinned copper- braiding shielding with polyester with polyester film to cover the vented tube and all connectors.
- There must be filler between the conductors and vent tube and all conductors must be of tin copper.
- As the transducer cable shall be used as the carrying rope, it shall preferably feature, for longitudinal stability, an internal kevlar core assembly, or equivalent.
- A polyamide pressure-compensation capillary tube for measuring the reference pressure, with an inside diameter of preferably 3 mm, but not less than 1,0 mm.
- End of cable connected by terminal box with hydrophobic filters and exchangeable humidity absorber.
- A fixing clamp for exact positioning of the pressure probe in a stilling well or tube must be available, manufactured of non-corrosive material.

6.5. Sensor for Water Level Measurement: Pressure Transducer: Piezo resistive sensor (Ceramic) with SDI12 output.

6.5.1. Application:



- a) The submersible pressure transducer will be used for hydrostatic water level measurement and will be measuring pressure using a vented cable.
- b) Pressure transducers must be capable of measuring water levels from 0 - 100 m, the range of each transducer being determined by the Department and pre-set in the factory. Typical ranges could be: 0 - 1 m; 0 – 2.5 m; 0 - 5 m; 0 – 10 m; 0 – 20 m, 0 – 30 m and >40 m on request.
- c) The pressure transducers must have a high reliability and ensure a large range of application for pressure measurement in all fields of water level measurement.

6.5.2. Design and Technical Details:



- a) Pressure Transducer housing:
 - The housing must be in an all-sealed enclosure and the pressure port must be vented to the atmosphere using a vented cable.
 - The transducer housing must be robust, corrosion-resistant, insensitive to impact and vibration and watertight up to at least 70 m of water column. (>70 m on request).
 - The opening to the sensor must be protected by a removable threaded cap to allow for maintenance.
 - The transducer housing shall preferably not exceed the following dimensions and weight:
 - Length: 500 mm
 - Diameter: 50 mm
 - Weight: 1 kg
 -
 - The transducer housing can be fitted with a watertight plug for connection to the transducer cable.
- b) Pressure Transducer sensor:
 - The submersible pressure transducer sensor must be based on a piezo-resistive ceramic pressure sensor element.
 - The measuring cell must be chemically and thermally resistant.
 - The pressure sensor must have a compensated operating temperature range of - 5°C to +70°C.
 - The sensor should be calibrated, temperature compensated and provide amplified analogue output signals for SDI12 output.
 - The sensor should have a supply voltage of between 9 to 32V and must have reverse polarity protection.
 - The sensor must have a response time of maximum 35 ms with a power consumption not exceeding 250mW. Typical sensor warm-up time must not exceed



2 seconds.

- The sensor proof pressure must be two times the rated pressure range. Proof pressure is the maximum pressure which may be applied without causing damage to the sensing element.
- The pressure sensor must have surge immunity according to EN 61000-4-5 for current output devices with cable lengths longer than 10m.

c) Measuring Accuracy of the Pressure Transducer Sensor:

- The sensor's Non-linearity (Best Straight Line fit), hysteresis (maximum output difference at any point within the operating pressure range for increasing and decreasing pressure) and repeatability must be 0.1 % FSO (Full Scale).

d) Vented transducer cable:



- The vented cable is factory fitted to the submersible pressure transducer housing and the length of cable for each submersible pressure transducer are being determined by the Department during procurement.
- The pressure transducer and transducer cable shall be designed to function satisfactorily with a cable length of up to 250 m.
- Flexible with Polyurethane jacketing material for corrosive media and maximum outer diameter 12 mm.
- Double sheathing with interposed tinned copper- braiding shielding with polyester with polyester film to cover the vented tube and all connectors.
- There must be filler between the conductors and vent tube and all conductors must be of tin copper.
- As the transducer cable shall be used as the carrying rope, it shall preferably feature, for longitudinal stability, an internal kevlar core assembly, or equivalent.
- A polyamide pressure-compensation capillary tube for measuring the reference pressure, with an inside diameter of preferably 3 mm, but not less than 1,0 mm.
- End of cable connected by terminal box with hydrophobic filters and exchangeable humidity absorber.
- A fixing clamp for exact positioning of the pressure probe in a stilling well or tube must be available, manufactured of non-corrosive material.

6.6. Sensor for Water Level Measurement: Bubbler:

6.6.1. Application:

This sensor will be utilised to measure water levels in open channels: ☐

- a) As standard the system must be able to measure up to 15 m of water depth.
- b) An option to measure up to 30 m of water depth should be offered.

6.6.2. Design and technical details:

a) Sensor housing:

- The compressor will be housed in a UV resistant standard sensor housing. ☐
- Standard housing dimensions (maximum):
 - Length: 250 mm
 - Height: 175 mm
 - Depth: 125 mm
- The housing will have an output, so that it could be connected directly to a data logger. ☐
- The output signal should be: 4 - 20 mA or SDI 12 Interface. ☐

b) Compressor:

- The compressor for generating air bubbles should be a built-in feature of the sensor. ☐
- The compressed air should preferably be generated by a maintenance free piston-pump using the indirect bubble-in principle. No system, using an external compressor or external gas bottles, will be considered. ☐

c) Bubble chamber:

- The bubble chamber must be robust, corrosion-resistant and insensitive to impact and vibration. ☐
- The bubble chamber must be fitted with an easy push-on connector for the measuring tube, or a screw-on type, suitable for at least a 75 mm Ø protection tube. ☐
- The bubble chamber diameter should preferably not exceed 100 mm. ☐

d) Measuring Tube:

- The measuring tube should preferably be flexible and manufactured of age-resistant PVC material. ☐
- The measuring tube should preferably not exceed an outer diameter of 10mm. ☐
- Together with the measuring tube, a suitable non-stretch, age resistant rope, for fixing the bubble chamber in wells, must be available. ☐

6.7. Sensor for Water Level Measurement: Radar sensor with measuring range: 8 meter.

6.7.1. Application:

☐

- a) The radar sensor must be capable of measuring water levels up to 8 meters, from the point of installation to the water level. This sensor will mainly be used where the water surface fluctuates a lot, where lots of silt occurs and where lots of debris is swept downstream during floods.
- b) The sensor must be suitably protected against lightning.

6.7.2. Design and technical details:

☐

a) Sensor housing:

- The sensor housing must be robust, corrosion resistant, UV resistant, insensitive to vibration and be water and dust protected to comply with rating IP68, as defined in IEC144.
- The sensor housing shall preferably not exceed a height of 200 mm.
- The sensor housing can be fitted with a watertight plug for connection to the data transmission cable.

b) Measuring Sensor:

☐

- The sensor shall be designed to function satisfactorily under the following temperature range: -10°C to +60°C
- The sensor must preferably have a standard resolution of 1 mm and an accuracy of 2 cm, or better, over the full measuring range.
- The beam angle must be a maximum of 8 degrees.
- The sensor should have a measuring interval of at least 60 seconds.

c) Data transmission cable:

☐

- The data transmission cable should function satisfactorily with a cable length of preferably 750 m.
- The outer diameter of the cable should preferably not exceed 10 mm.

d) Power Supply:

☐

- The power supply for the sensor should be from 10 - 28 volt.
- The power consumption of the sensor should preferably not exceed 50 mA during measurement mode, and not exceed 1 µA during standby mode.

e) Output Signal:

☐

- The output signal of the sensor should preferably be transmitted via RS 232 with 4-20 mA Interface or RS 485 with SDI Interface.

6.8. Sensor for Water Level Measurement: Radar sensor with measuring range: 15 meter.

6.8.1. Application:

☐

- a) The radar sensor must be capable of measuring water levels up to 15 meters, from the point of installation to the water level. This sensor will mainly be used where the water surface fluctuates a lot, where lots of silt occurs and where lots of debris is swept downstream during floods.
- b) The sensor must be suitably protected against lightning.

6.8.2. Design and technical details:

☐

a) Sensor housing:

- The sensor housing must be robust, corrosion resistant, UV resistant, insensitive to vibration and be water and dust protected to comply with rating IP68, as defined in IEC144.
- The sensor housing shall preferably not exceed a height of 200 mm.
- The sensor housing can be fitted with a watertight plug for connection to the data transmission cable.

b) Measuring Sensor:

☐

- The sensor shall be designed to function satisfactorily under the following temperature range: -10°C to +60°C
- The sensor must preferably have a standard resolution of 1 mm and an accuracy of 2 cm, or better, over the full measuring range.
- The beam angle must be a maximum of 8 degrees.
- The sensor should have a measuring interval of at least 60 seconds.

c) Data transmission cable:

☐

- The data transmission cable should function satisfactorily with a cable length of preferably 750 m.
- The outer diameter of the cable should preferably not exceed 10 mm.

d) Power Supply:

☐

- The power supply for the sensor should be from 10 - 28 volt.
- The power consumption of the sensor should preferably not exceed 50 mA during measurement mode, and not exceed 1 µA during standby mode.

e) Output Signal:

☐

- The output signal of the sensor should preferably be transmitted via RS 232 with 4-20 mA Interface or RS 485 with SDI Interface.

6.9. Sensor for Water Level Measurement: Radar sensor with measuring range: 30 meter.

6.9.1. Application:

☐

- a) The radar sensor must be capable of measuring water levels up to 30 meters, from the point of installation to the water level. This sensor will mainly be used where the water surface fluctuates a lot, where lots of silt occurs and where lots of debris is swept downstream during floods.
- b) The sensor must be suitably protected against lightning.

6.9.2. Design and technical details:

☐

a) Sensor housing:

- The sensor housing must be robust, corrosion resistant, UV resistant, insensitive to vibration and be water and dust protected to comply with rating IP67, as defined in IEC144.
- The sensor housing shall preferably not exceed a height of 250 mm.
- The sensor housing can be fitted with a watertight plug for connection to the data transmission cable.

b) Measuring Sensor:

☐

- The sensor shall be designed to function satisfactorily under the following temperature range: -10°C to +60°C
- The sensor must preferably have a standard resolution of 3 mm and an accuracy of 4 cm, or better, over the full measuring range.
- The beam angle must be a maximum of 12 degrees.
- The sensor should have a measuring interval of at least 60 seconds.

c) Data transmission cable:

☐

- The data transmission cable should function satisfactorily with a cable length of preferably 750 m.
- The outer diameter of the cable should preferably not exceed 10 mm.

d) Power Supply:

☐

- The power supply for the sensor should be from 10 - 28 volt.
- The power consumption of the sensor should preferably not exceed 50 mA during measurement mode, and not exceed 1 µA during standby mode.

e) Output Signal:

☐

- The output signal of the sensor should preferably be transmitted via RS 232 with 4-20 mA Interface or RS 485 with SDI Interface.

6.10. Sensor for Water Level Measurement: Contact Gauge.

6.10.1. Application:

☐

- a) The contact gauge must be portable and it will be used for the measurement of water levels, especially in boreholes and stilling wells.

6.10.2. Design and technical details:

☐

- a) The contact gauge should have an electrode inside the measuring probe, when the probe makes contact with the water surface, an acoustic beep should be sounded.
- b) The frame of the contact gauge should also consist of a signal lamp that lights up when the probe makes contact with the water surface.
- c) The measuring tape should preferably be white or yellow and must not be able to stretch.
- d) The graduations on the tape should be clearly marked in metres, decimetres and centimetres.
- e) The probe body should be manufactured from corrosive resistant material and should not exceed an outer diameter of 25 mm.
- f) The contact gauge should make use of commercially available dry alkaline batteries.
- g) Operating temperature range to be at least between -5°C to $+40^{\circ}\text{C}$.
- h) The contact gauge must be available in the following measuring ranges: 50m, 80m, 100m, 150m, 200m, 250m, 500m and 750m.
- i) The contact gauge must be supplied in a robust carry case;
- j) All accessories must be listed and priced separately on the price schedules.

6.11. Sensor for Water Level Measurement: Contact Gauge with temperature.

6.11.1. Application:

☐

- a) The contact gauge must be portable and it will be used for the measurement of water levels, especially in boreholes and stilling wells.

6.11.2. Design and technical details:

☐

- a) The contact gauge should have an electrode inside the measuring probe, when the probe makes contact with the water surface, an acoustic beep should be sounded.
- b) The frame of the contact gauge should also consist of a signal lamp that lights up when the probe makes contact with the water surface.
- c) The measuring tape should preferably be white or yellow and must not be able to stretch.
- d) The graduations on the tape should be clearly marked in metres, decimetres and centimetres.
- e) The probe body should be manufactured from corrosive resistant material and should not exceed an outer diameter of 25 mm.
- f) The contact gauge should make use of commercially available dry alkaline batteries.
- g) Operating temperature range to be at least between -5°C to $+40^{\circ}\text{C}$.
- h) The contact gauge must be available in the following measuring ranges: 50m, 80m, 100m, 150m, 200m, 250m, 500m and 750m.
- i) The contact gauge should offer the possibility to measure the water temperature optional.
- j) The temperature will be displayed on a LC display.
- k) The contact gauge must be supplied in a robust carry case;
- l) All accessories must be listed and priced separately on the price schedules.

6.12. Sensor for Weather Measurement: Rain gauge, tipping bucket with integrated syphon mechanism (high levels of accuracy), powder coated aluminium/ ASA Polymer:

6.12.1. Application:

- a) The tipping bucket rain gauge is recognised as the standard for measuring rainfall and other precipitation in remote and unattended locations.
- b) It has an integrated syphon mechanism delivers high level accuracy.

6.12.2. Design and technical details:

- a) Unit should consist of collector funnel and integrated siphon control mechanism, an outer enclosure with quick release fasteners and base which houses the tipping bucket mechanism.
- b) The catchment enclosure must be manufactured from powder coated aluminium and the catchment base from UV-resistant ASA Polymer.
- c) Operating temperature range to be at least between 4°C to +70°C,
- d) Depending on the needs, the size of the opening should be 200 mm diameter or smaller.
- e) The minimum depth of rainfall to be measured will be either 1.0 mm, 0.5 mm, 0.2 mm or 0.1 mm.
- f) The rain gauge should be able to measure an intensity of at least 0-400 mm/h.
- g) The accuracy of the unit shall be +/- 2% for 0 – 250mm/hr.
- h) An optional data logger can be offered with a download option via laptop and data transmission unit using a RS 232 interface or with an impulse output, for the data loggers as specified in this document.
- i) Spares and accessories i.e. a warm-up device must be offered as an optional extra.
- j) A calibration certificate shall be produced by the manufacturer with delivery of the item.

- 6.13. Sensor for Weather Measurement: Rain gauge, tipping bucket with integrated syphon mechanism (high levels of accuracy), for low rainfall events, powder coated aluminium/ ASA Polymer:
- 6.13.1. Application:
- a) The tipping bucket rain gauge is recognised as the standard for measuring rainfall and other precipitation in remote and unattended locations.
 - b) It has an integrated syphon mechanism delivers high level accuracy.
- 6.13.2. Design and technical details:
- a) Unit should consist of collector funnel and integrated siphon control mechanism, an outer enclosure with quick release fasteners and base which houses the tipping bucket mechanism.
 - b) The catchment enclosure must be manufactured from powder coated aluminium and the catchment base from UV-resistant ASA Polymer.
 - c) Operating temperature range to be at least between 4°C to +70°C,
 - d) Depending on the needs, the size of the opening should be 200 mm diameter or smaller.
 - e) The minimum depth of rainfall to be measured will be either 0.5 mm, 0.2 mm or 0.1 mm.
 - f) The rain gauge should be able to measure an intensity of at least 0-400 mm/h.
 - g) The accuracy of the unit shall be better than 7% for 150 – 200mm/hr.
 - h) An optional data logger can be offered with a download option via laptop and data transmission unit using a RS 232 interface or with an impulse output, for the data loggers as specified in this document.
 - i) Spares and accessories i.e. a warm-up device must be offered as an optional extra.
 - j) A calibration certificate shall be produced by the manufacturer with delivery of the item.

6.14. Sensor for Weather Measurement: Rain gauge, tipping bucket with integrated syphon mechanism (high levels of accuracy), ASA Polymer:

6.14.1. Application:

- a) The tipping bucket rain gauge is recognised as the standard for measuring rainfall and other precipitation in remote and unattended locations.
- b) It has an integrated syphon mechanism delivers high level accuracy.

6.14.2. Design and technical details:

- a) Unit should consist of collector funnel and integrated siphon control mechanism, an outer enclosure with quick release fasteners and base which houses the tipping bucket mechanism.
- b) The catchment enclosure and the catchment base must be manufactured from UV-resistant ASA Polymer.
- c) Operating temperature range to be at least between 4°C to +70°C,
- d) Depending on the needs, the size of the opening should be 200 mm diameter or smaller.
- e) The minimum depth of rainfall to be measured will be either 0.5 mm or 0.2 mm.
- k) The rain gauge should be able to measure an intensity of at least 0-400 mm/h.
- f) The accuracy of the unit shall be +/- 5% for 0 – 200mm/hr.
- g) An optional data logger can be offered with a download option via laptop and data transmission unit using a RS 232 interface or with an impulse output, for the data loggers as specified in this document.
- h) Spares and accessories i.e. a warm-up device must be offered as an optional extra.
- i) A calibration certificate shall be produced by the manufacturer with delivery of the item.

6.15. Sensor for Weather Measurement: Barometric Pressure:

6.15.1. Pressure Transducer:



a) Application:

- The pressure measurement must preferably operate, using the barometric pressure method.
- The transducer must provide output to external data logging equipment (1...5V Volt, 4 – 20 mA).

b) Design and technical details:

- Resolution: 0.1mm hPa;
- Range: 600 to 1060 hPa;
- Accuracy: 0.8 mm hPa;

6.16. Sensor for Weather Measurement: Humidity and Air Temperature:

6.16.1. Design and technical details – Humidity Sensor:

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- a) The probe must have a measuring range of 0 – 100%RH.
- b) Operating temperature range to be at least between -5°C to +50°C.
- c) The humidity measurement accuracy must not be less than 3% over the full measuring range.
- d) The typical long-term stability should be better than 1% RH per year.

6.16.2. Design and technical details – Air Temperature Sensor:

☐

- a) The probe should be of the Platinum type “T100 type”.
- b) Temperature measurement range to be at least between -20°C to +50°C.
- c) The sensitivity of the measuring element should be about 0.1 °C, or better.
- d) The probe shall be designed to allow measurement at 1.5 m above the ground, sheltered from the sun.

6.17. Sensor for Weather Measurement: Anemometer:

6.17.1. Design and technical details:

☐

- a) An anemometer with a 3-cup anemo-transmitter, with pulsed output proportional to rotation speed, should be offered.
- b) The measurement range of the anemometer should range from 0.5 m/s to at least 50 m/s, (180 km/hour) but should withstand a wind speed of up to 60 m/s.
- c) Operating temperature range to be at least between -5°C to +50°C.
- d) The accuracy shall be better than 0.5 m/s, under 20 m/s and better than 0.3 m/s, over 20 m/s.
- e) The threshold wind speed value shall be better than 0.5 m/s.

6.18. Sensor for Weather Measurement: Wind Direction Indicator:

6.18.1. Design and technical details:

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- a) The measurement of the direction of the wind shall be with a continuous rotation transmitter.
- b) Operating temperature range to be at least between -5°C to +50°C.
- c) The range of measurement shall be 360° (mechanical) and 355° (electrical).
- d) The accuracy shall be better than 3° and the threshold value better than 1 m/s all over the displacement range.

6.19. Sensor for Weather Measurement: Net Radiation:

6.19.1. Design and technical details:



- a) The pyranometer shall be calibrated for the daylight spectrum and preferably provide an output of 4 – 20 mA with an accuracy better than 5%.
- b) The measurement range of the radiometer should range from 0 to at least 1 500 W/m².
- c) Operating temperature range to be at least between -5°C to +50°C.
- d) Its stability shall be less than 1% change per year.
- e) The temperature dependence shall not exceed 0.1% per °C.
- f) The Cosine response shall be less than 3% of the value with a zenith angle of 0° to 80°.
- g) The azimuth error shall be less than 3% of the value.
- h) The sensor shall be housed in a waterproof case.

7. POWER SUPPLY EQUIPMENT

7.1. Battery, sealed, rechargeable, valve regulated lead-acid solar type, 12 Volt, 120 Ah capacity:

7.1.1. Design and technical details:

- a) Maintenance free with a low self-discharge rate.
- b) The bidder will offer a set of terminal clamps/screws/lugs with each battery.
- c) The bidder will offer a suitable insulating battery box and cover for extreme weather conditions, as an accessory.

7.2. Battery, sealed, rechargeable, valve regulated lead-acid solar type, 12 Volt, 105 Ah capacity:

7.2.1. Design and technical details:

- a) Maintenance free with a low self-discharge rate.
- b) The bidder will offer a set of terminal clamps/screws/lugs with each battery.
- c) The bidder will offer a suitable insulating battery box and cover for extreme weather conditions, as an accessory.

7.3. Battery, sealed, rechargeable, lead-acid solar type, 12 Volt, 40 Ah capacity:

7.3.1. Design and technical details:

- a) Maintenance free with a low self-discharge rate.
- b) The bidder will offer a set of terminal clamps/screws/lugs with each battery.
- c) The bidder will offer a suitable insulating battery box and cover for extreme weather conditions, as an accessory.

7.4. Battery, sealed, rechargeable, lead-acid solar type, 12 Volt, 28 Ah capacity:

7.4.1. Design and technical details:

- a) Maintenance free with a low self-discharge rate.
- b) The bidder will offer a set of terminal clamps/screws/lugs with each battery.
- c) The bidder will offer a suitable insulating battery box and cover for extreme weather conditions, as an accessory.

7.5. Battery, sealed, rechargeable, lead-acid solar type, 12 Volt, 12 Ah capacity:

7.5.1. Design and technical details:

- a) Maintenance free with a low self-discharge rate.
- b) The bidder will offer a set of terminal clamps/screws/lugs with each battery.

- c) The bidder will offer a suitable insulating battery box and cover for extreme weather conditions, as an accessory.

7.6. Battery, sealed, rechargeable, lead-crystal solar type, 12 Volt, 28 Ah capacity:

7.6.1. Design and technical details:

- a) Maintenance free with a low self-discharge rate.
- b) The bidder will offer a set of terminal clamps/screws/lugs with each battery.
- c) The bidder will offer a suitable insulating battery box and cover for extreme weather conditions, as an accessory.

7.7. Battery, size D, Lithium-thionyl chloride type, 3.6 Volt, 13 Ah capacity:

7.7.1. Design and technical details:

- a) Nominal Capacity: 13Ah;
- b) Corrosion free.

7.8. Battery, size D, Lithium-thionyl chloride type, 3.6 Volt, 13 Ah capacity with PCB connector,

7.8.1. Design and technical details:

- a) Nominal Capacity: 13Ah;
- b) Corrosion free.
- c) Connector:
 - Molex 2-Pin PCB Mount Quick Connector with two wire leads, Red (positive) and Black (negative);
 - 22 AWG PVC Stranded Tinned Wire with 12" leads

7.9. Battery, size D, Lithium-thionyl chloride type, 3.6 Volt, 13 Ah capacity with ELP-02V connector:

7.9.1. Design and technical details:

- a) Nominal Capacity: 13Ah;
- b) Corrosion free.
- c) Connector:
 - ELP-02V socket contact;
 - 90 mm x 0.5 mm² wire lead.

7.10. Battery, size D, Lithium-thionyl chloride type, 3.6 Volt, 26 Ah capacity with ELP-02V connector:

7.10.1. Design and technical details:

- a) Nominal Capacity: 26Ah;
- b) Corrosion free.
- c) Connector:
 - ELP-02V socket contact;
 - 90 mm x 0.5 mm² wire lead.

7.11. Battery, size AA, Lithium-thionyl chloride type, 3.6 Volt, 2.6 Ah capacity:

7.11.1. Design and technical details:

- a) Nominal Capacity: 2.6Ah;
- b) Corrosion free.

7.12. Battery, size D, two cell, Lithium-thionyl chloride type, 3.9 Volt, 38 Ah capacity with ATX connector,

7.12.1. Design and technical details:

- a) Nominal Capacity: 38 Ah;
- b) Series configuration;
- c) Sealed in shrink material;
- d) Corrosion free;
- e) Connector:
 - ATX 4 pin power plug;
 - 50mm x 0.5 mm² wire lead.

7.13. Battery, size A, Tadiran Lithium type, 3.9 Volt, 1.55 Ah capacity with tagged Hybrid Layer Capacitor polarised pins,

7.13.1. Design and technical details:

- a) Nominal Capacity: 1.55 Ah;
- b) Nominal energy: 0.86 Wh;
- c) Low impedance;
- d) Corrosion free.

7.14. Battery, size C, Alkaline type, 1.5 Volt,

7.14.1. Design and technical details:

a) Nominal Capacity: 7,800 mAh;

7.15. Battery, size AA, Alkaline type, 1.5 Volt,

7.15.1. Design and technical details:

a) Nominal Capacity: 2,850 mAh;

7.16. Battery, size AAA, Alkaline type, 1.5 Volt,

7.16.1. Design and technical details:

a) Nominal Capacity: 1,150 mAh;

7.17. Solar Panels, 12 Volt, crystalline:

7.17.1. Normal/Rigid Panels (**SOLAR PANEL 1 TO 5**):

- a) The solar panel shall preferably meet the following specifications:
- The solar panel must preferably be of the “crystalline” Photovoltaic Module type or better.
 - The “crystalline” cells must be encapsulated between a tempered glass cover.
 - Adjustable (between 0 and 45 degrees) horizontal mounting brackets for all offered solar panels should be offered as an accessory.

7.17.2. Flexible Panel (**SOLAR PANEL 6**):

- a) The solar panel shall preferably meet the following specifications:
- The solar cells should be deposited with multi layers of silicon alloy materials onto a thin stainless steel substrate in a roll-to-roll process.
 - The cell assembly need to be laminated in flexible and durable weather resistant polymers that provide long life and high reliability.

| ELECTRICAL & PHYSICAL CHARACTERISTICS | SOLAR PANEL 1 | SOLAR PANEL 2 | SOLAR PANEL 3 | SOLAR PANEL 4 | SOLAR PANEL 5 | SOLAR PANEL 6 |
|--|---------------------------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| Voltage (V) | 12 | 12 | 12 | 12 | 12 | 12 |
| Maximum Power (Watts) | 10 | 20 | 40 | 50 | 80 | 32 |
| Maximum Length (mm) | 400 | 600 | 600 | 650 | 1 000 | 1 500 |
| Maximum Width (mm) | 400 | 600 | 700 | 700 | 700 | 500 |
| Maximum Depth (mm) | 50 | 50 | 50 | 50 | 50 | 50 |
| Maximum Weight (kg) | 2 | 4 | 6 | 7 | 10 | 4 |
| Electrical wire colour code | Positive (+) Red / Negative (-) Black | | | | | |

7.18. Solar Charge Controllers:

- a) The solar charge controller shall meet the following specifications:
- The controller shall be capable of maintaining the output voltage to the battery within the required limits with a $\pm 25\%$ fluctuation of the input voltage. This shall apply to the total temperature range specified for the instrument.
 - The controller shall contain suitable circuitry to protect itself, to limit the current supplied to the battery, for in the event of malfunctioning of any of the major modules supplied from the regulator or in the event of what is commonly known as "thermal runaway".
 - No damage shall be caused to either the instrument or the controller if the input voltage polarity to the controller is accidentally or intentionally reversed.
 - The polarity of the supply voltage to the controller shall be clearly marked either on the associated connector or next to it on the instrument's cabinet.
 - To protect the batteries from irreversible damage, a load shedding facility should be

incorporated, in case of power supply failure.

- The controller should preferably display two LED's; one to indicate that the regulator is charging the back-up battery, the other to indicate whether or not the load-shed facility is in operation.

b) The following three (3) controllers shall be offered:

| TECHNICAL CHARACTERISTICS | CONTROLE R 1 | CONTROLE R 2 | CONTROLE R 3 |
|--|-----------------|-----------------|-----------------|
| Nominal Voltage (Volt) | 12 | 12 | 12 |
| Maximum Module Current (Amp) | 4 | 8 | 15 |
| Maximum Load Current (Amp) | 4 | 8 | 15 |
| Maximum Own Consumption (mAmp) | 6 | 6 | 25 |
| Maximum Length (mm) | 100 | 100 | 100 |
| Maximum Width (mm) | 150 | 150 | 150 |
| Maximum Depth (mm) | 50 | 50 | 50 |
| Maximum Connection Terminal size (mm ²) | 2,5 | 2,5 | 2,5 |

7.19. Power Control Unit or Mains Transformer:

a) The power control unit and/or mains transformer shall meet the following specifications:

- The power control unit shall be a combination between a solar charge controller and a mains transformer. ☐
- The power control unit shall be able to handle an input range of a maximum of 250 volts, with an output of at least 12 volts. ☐
- The power control unit shall have a fuse as well as a LED indicator. ☐
- The mains transformer shall be able to handle an input range of a maximum of 250 volts, with an output of at least 12 volts. ☐

b) Lightning and surge protection

- The mains supply shall be equipped with adequate surge protection to prevent the equipment from damage caused by switching transients and static discharges. ☐

7.20. Battery Charger, 12 Volt, automatic, 8 stage, intelligent:

7.20.1. Application

- The charger will be a fully automatic 8 step smart charger and battery support unit; it will be easily portable. The charger should be suitable for all types of lead-acid batteries, and should be able to test whether a battery is able to take and hold a charge.

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7.20.2. Design and technical details

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- The charger shall be portable and supplied with not less than 4-meter extended charge cable and a protective rubber bumper for maximum convenience and versatility.
- The charger cable will be designed so that additional connector cables may be connected for different applications.
- The charger should have an automatic diagnostic function that test whether the battery is able to take and hold a charge.
- The charger should have a supply function that allows it to be used as a power supply to support vehicle electronic during sensitive battery changeovers.
- The weight of the unit should not exceed 900g
- The dimensions of the unit should preferably not exceed: 200 mm long x 100 mm wide x 50 mm High
- The following minimum specifications will apply:
 - Voltage, Output: 12V;
 - Voltage, Input Rated AC: 220-240VAC, 50-60HZ;
 - Voltage, minimum battery: 2.0V;
 - Current, charging: 10A max;
 - Current, mains: 1.0A rms (at full charging current);
 - Current, drain: <1Ah/month;
 - Current, Ripple: <4%;
 - Ambient temperature: -20°C to +50°C, with automatic reduction in output power at high temperature;
 - Suitable battery types: All types of 12V lead-acid batteries (WET, MF, Ca/Ca, AGM and Gel);
 - Suitable battery capacity: 20-200Ah, up to 300Ah for maintenance;
 - Insulation class: IP65.

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SECTION 4: DETAIL SPECIFICATIONS

B. HANDHELD ACOUSTIC DOPPLER CURRENT METERS

1. SCOPE:

This instrument will make use of the Acoustic Doppler principle and will mainly be utilised for high accuracy velocity measurements in laboratories, small natural streams and small to medium canals.

2. HANDHELD ACOUSTIC DOPPLER INSTRUMENT 1:

Normal conventional procedures will be followed with the physical measurement, namely the wading method.

2.1 Current meter / Sensor / Probe:

- a) The instrument body must be robust, corrosion resistant and insensitive to vibration.
- b) The instrument should be capable of measuring discharge accurately in water depths of 2.5 cm.
- c) The standard offered instrument should measure two dimensional flow but a three dimensional probe/sensor should be included in the offer.
- d) Velocity measurement range of 0.002 m/s to 3 m/s.
- e) Velocity resolution of not less than 0.001 m/s.
- f) Velocity accuracy of $\pm 2\%$ of measured velocity.
- g) The instrument should preferably not exceed the following dimensions and weight:
 Total probe width of 150 mm and 3 kg.
- h) The instrument should be able to operate within the following environmental conditions: - 5°C to 45°C
- i) The instrument/probe should include a flexible cable, not less than 2 m in length, and should include a standard RS 232/USB converter supplied interface for using with a hand-held unit or a PC / Laptop.
- j) The instrument / sensor must be able to be supported on a non-corrosive rod with clearly marked cm graduations on it.

2.2 Hand-held Interface / Counter Unit:

- a) The unit housing should be robust, corrosion resistant, UV protected, water-proof and insensitive to vibration.
- b) The unit should include a clearly visible backlit LC Display, simple membrane type key-pad interface or touch screen interface as well as a RS 232 / USB / Wireless communication interface.
- c) The unit should be able to display the measured point velocity in real-time.
- d) The internal memory should be of adequate size so that approximately 50 discharge measurements could be saved.

- e) The unit should work adequately for at least 20 hours on standard size commercially available dry cell batteries.
- f) The memory should be of the non-volatile type so that data is not lost, should the batteries become flat.
- g) A Software package for the automatic computation of discharge measurements, according to the relevant ISO & WMO standards, should be included within the unit.
- h) The following minimum parameters should be displayed and printed in a spreadsheet format:
 - File Name / Station Name / Station Number
 - Averaging Time
 - Staff Gauge Height / Gauge Plate reading
 - Total Width
 - Total Area
 - Total Discharge
 - Average / Mean Velocity
 - Table showing all the observed data, i.e.: Number, Distance, Depth, Velocity, etc.

3.1 Accessories:

- a) The appropriate data transfer cable for extracting data from the hand-held unit / counter unit to another PC or Laptop, should be included in the offer.
- b) The appropriate tools to service and connect the equipment should be included in the offer.
- c) All equipment should be packed in suitable robust instrument carry case/s.
- d) A list of general spares / Services that are available on this instrument (wading rod adaptors, rods, carry case, etc.) will be listed and priced in the Price Schedules – “Spares”.

3 HANDHELD ACOUSTIC DOPPLER INSTRUMENT 2:

Normal conventional procedures will be followed with the physical measurement, namely the wading method.

3.1 Current meter / Sensor / Probe:

- a) The instrument / sensor must be able to be supported on a 20mm diameter, non-corrosive rod.
- b) The rod should have clearly marked cm graduations on it.
- c) The instrument body must be robust, corrosion resistant and insensitive to vibration.
- d) The instrument should be capable of measuring discharge accurately in water depths of 2.5 cm.
- e) The standard offered instrument should measure two dimensional flow but a three dimensional probe/sensor should be included in the offer.
- f) Velocity measurement range of 0.002 m/s to 3 m/s.
- g) Velocity resolution of not less than 0.001 m/s.
- h) Velocity accuracy of $\pm 2\%$ of measured velocity.
- i) The instrument should preferably not exceed the following dimensions and weight: Total probe width of 150 mm and 3 kg.
- j) The instrument should be able to operate within the following environmental conditions: - 5°C to 45°C
- k) The instrument/probe should include a flexible cable, not less than 2 m in length, and should include a standard RS 232/USB converter supplied interface for using with a hand-held unit or a PC / Laptop.

3.2 Hand-held Interface / Counter Unit:

- a) The unit housing should be robust, corrosion resistant, UV protected, water-proof and insensitive to vibration.
- b) The unit should include a clearly visible backlit LC Display, simple membrane type key-pad interface or touch screen interface as well as a RS 232 / USB / Wireless communication interface.
- c) The unit should be able to display the measured point velocity in real-time.
- d) The internal memory should be of adequate size so that approximately 50 discharge measurements could be saved.
- e) The unit should work adequately for at least 20 hours on standard size commercially available dry cell batteries.
- f) The memory should be of the non-volatile type so that data is not lost, should the batteries become flat.
- g) A Software package for the automatic computation of discharge measurements, according to the relevant ISO & WMO standards, should be included within the unit.
- h) The following minimum parameters should be displayed and printed in a spreadsheet format:
 - File Name / Station Name / Station Number

- Averaging Time
- Staff Gauge Height / Gauge Plate reading
- Total Width
- Total Area
- Total Discharge
- Average / Mean Velocity
- Table showing all the observed data, i.e.: Number, Distance, Depth, Velocity, etc.

3.2 Accessories:

- a) The appropriate data transfer cable for extracting data from the hand-held unit / counter unit to another PC or Laptop, should be included in the offer.
- b) The appropriate tools to service and connect the equipment should be included in the offer.
- c) All equipment should be packed in suitable robust instrument carry case/s.
- d) The instrument / sensor must be able to be supported on a non-corrosive rod with clearly marked cm graduations on it.
- e) A list of general spares / Services that are available on this instrument (wading rod adaptors, rods, carry case, etc.) will be listed and priced in the Price Schedules – “Spares”.

SECTION 4: DETAIL SPECIFICATIONS

C. ACOUSTIC DOPPLER CURRENT PROFILING SYSTEMS

1. SCOPE:

Acoustic Doppler Technology has been used for many years, primarily in the study of ocean currents and estuaries. It is lately being used for the measurement of stream flow, especially in larger rivers, where conventional discharge measurement techniques are either very expensive, labour intensive or impossible.

Normal conventional procedures will be followed with the physical measurement by measuring the vertical velocity profile and the depth in user-selectable number of sections, commonly known as verticals, across the width of the stream or river.

2. ACOUSTIC DOPPLER CURRENT PROFILER 1;

This instrument will make use of the Acoustic Doppler principle and will mainly be utilised in medium to large streams / rivers.

No bottom tracking and GPS data to calculate discharge need to be performed by this instrument.

2.1. Carrying Vessel:

- a) The vessel must be robust, corrosion resistant, stream lined and the hull design should preferably be of the Catamaran or Tri-maran type.
- b) The vessel shall be designed and be tested to be stable in rough water conditions and currents of up to 4 m/s.
- c) The vessel should preferably not exceed 1 000 mm length, 500 mm width and 15 kg weight (boat alone).
- d) The profiler shall be fitted to the vessel in such a manner that minimum damage to the profiler could be caused by any floating debris.
- e) The power supply and communication system shall be built into a compartment on/in the vessel and should be watertight.

2.2. Acoustic Doppler Current Profiler:

- a) The instrument body must be robust, corrosion resistant, water tight and insensitive to vibration.
- b) The instrument must be capable of measuring discharge accurately in water depths from at least 0.4 m to 10 m.
- c) The profiler should have a minimum of three transducer beams, in one plane, operating at approximately 2 MHz.

- d) The following measurement accuracies will apply:
- Velocity measurement range of at least 5 m/s.
 - Velocity accuracy of $\pm 2\%$ of measured velocity.
 - The current should be measured in depth cells of a minimum of 20 cm.
 - The minimum blanking distance should be 10 cm.
- e) The instrument should be able to operate within the following environmental conditions: 0°C to 35°C
- f) The instrument should have a built-in temperature sensor, which can measure between -2°C to 30°C with an accuracy of 0.5°C or better.
- g) The profiler shall have an internal memory capacity of at least 4 MB.

2.3. Power Supply:

- a) The power supply for the profiler and communication system should be commercially available dry cell battery / batteries or rechargeable sealed lead-acid battery / batteries.
- b) The power switch to power up the complete system should be placed on the boat in such a manner that it has easy access to the operator – no unscrewing of lids, etc.

2.4. Communication:

- a) Communication between the profiler and a hand-held unit shall preferably be via two-way radio telemetry or blue tooth technology.
- b) The transceiver and / or the handheld unit shall preferably be powered by its own power supply.
- c) The communications antenna should also be fitted on or in the boat to minimise any damage by floating debris.

2.5. Data Receiver:

- d) The data receiver unit housing should be robust, corrosion resistant, UV protected, splash-proof and insensitive to vibration.
- e) The unit should include a clearly visible backlit LC Display, simple membrane type key-pad interface or touch screen interface as well as a RS 232 / USB / Wireless communication interface.
- f) The unit should control the total gauging process and give the operator understandable instructions how to do the measurements.
- g) The unit should be able to display the total discharge after the gauging is completed.
- h) The hand-held unit should work adequately for at least 10 hours continuously on standard size commercially available dry cell batteries.
- i) The memory should be of the non-volatile type so that data is not lost should the batteries become flat.
- j) The gauging parameters, calculations, illustrations, tables, etc. should be able to be transferred to a PC / Laptop via a standard RS 232 / USB / Wireless communication interface.

2.6. Application Software.

- a) A Software package for the automatic computation of discharge measurements, according to the relevant ISO & WMO standards, should be included within the hand-held unit and will be user friendly.

3. ACOUSTIC DOPPLER CURRENT PROFILER 2;

This instrument will make use of the Acoustic Doppler principle and will mainly be utilised in small to medium streams / rivers.

Bottom tracking should be performed by this instrument for discharge calculation.

3.1. Carrying Vessel:

- a) The vessel must be robust, corrosion resistant, stream lined and the hull design should preferably be of the Catamaran or Tri-maran type.
- b) The vessel shall be designed and be tested to be stable in rough water conditions and currents of up to 2 m/s.
- c) The vessel should preferably not exceed 500 mm length, 350 mm width and 5 kg weight (boat alone).
- d) The profiler shall be fitted to the vessel in such a manner that minimum damage to the profiler could be caused by any floating debris.
- e) The power supply and communication system shall be built into a compartment on/in the vessel and should be watertight.

3.2. Acoustic Doppler Current Profiler:

- a) The instrument body must be robust, corrosion resistant, water tight and insensitive to vibration.
- b) The instrument must be capable of measuring discharge accurately in water depths from at least 0.2 m to 2.5 m.
- c) The profiler should have a minimum of three transducer beams, in one plane, operating at approximately 2 MHz.
- d) The instrument shall provide parameters that can be used to assess the validity of the velocity and / or discharge measurement. These parameters must identify when conditions violate limits of the system, thus threatening data integrity, i.e. Low signal correlation, unusually strong increases in signal intensity, high error velocities and uncertainty of water depth.
- e) The following measurement accuracies will apply:
 - Velocity measurement range of at least 1.5 m/s.
 - Velocity accuracy of $\pm 1.0\%$ of measured velocity.
 - The current should be measured in depth cells of a minimum of 3 cm., or better.
 - The minimum blanking distance should be 3 cm., or better.
- f) The instrument should be able to operate within the following environmental conditions: 0°C to 35°C
- g) The instrument should have a built-in temperature sensor, which can measure between -2°C to 30°C with an accuracy of 0.5°C or better.

3.3. Power Supply:

- a) The power supply for the profiler and communication system should be commercially available dry cell battery / batteries or rechargeable sealed lead-acid

battery / batteries.

- b) The power switch to power up the complete system should be placed on the boat in such a manner that it has easy access to the operator – no unscrewing of lids, etc.

3.4. Communication:

- a) Communication between the profiler and a hand-held unit shall preferably be via two-way radio telemetry or blue tooth technology.
- b) The transceiver and / or the handheld unit shall preferably be powered by its own power supply.
- c) The communications antenna should also be fitted on or in the boat to minimise any damage by floating debris.

3.5. Data Receiver:

- a) The data receiver unit housing should be robust, corrosion resistant, UV protected, splash-proof and insensitive to vibration.
- b) The unit should include a clearly visible backlit LC Display, simple membrane type key-pad interface or touch screen interface as well as a RS 232 / USB / Wireless communication interface.
- c) The unit should control the total gauging process and give the operator understandable instructions how to do the measurements.
- d) The unit should be able to display the total discharge after the gauging is completed.
- e) The hand-held unit should work adequately for at least 10 hours continuously on standard size commercially available dry cell batteries.
- f) The memory should be of the non-volatile type so that data is not lost should the batteries become flat.
- g) The gauging parameters, calculations, illustrations, tables, etc. should be able to be transferred to a PC / Laptop via a standard RS 232 / USB / Wireless communication interface.

3.6. Application Software.

- a) A Software package for the automatic computation of discharge measurements, according to the relevant ISO & WMO standards, should be included within the hand-held unit and will be user friendly.

4. ACOUSTIC DOPPLER CURRENT PROFILER 3.

This instrument will make use of the Acoustic Doppler principle and will mainly be utilised in small to medium streams / rivers.

Bottom tracking and Global Positioning should be performed by this instrument for discharge calculation.

5.1 Carrying Vessel:

- a) The vessel must be robust, corrosion resistant, stream lined and the hull design should preferably be of the Catamaran or Tri-maran type.
- b) The vessel shall be designed and be tested to be stable in rough water conditions and currents of up to 5 m/s.
- c) The vessel should preferably not exceed 1 500 mm length, 900 mm width and 10 kg weight (boat alone).
- d) The profiler shall be fitted to the vessel in such a manner that minimum damage to the profiler could be caused by any floating debris.
- e) The power supply and communication system shall be built into a compartment on/in the vessel and should be watertight.
- f) The option must be provided to upgrade the existing system to the latest available system by upgrading the carrying vessel individually.

5.2 Acoustic Doppler Current Profiler:

- a) The instrument body must be robust, corrosion resistant, water tight and insensitive to vibration.
- b) The instrument should include bottom tracking and must be able of measuring discharge accurately, within 1% of true water depth, in water depths from at least 1.0 m to 20 m.
- c) The profiler should have a minimum of three transducer beams, operating between 0.5 MHz and 5 MHz.
- d) The instrument shall provide parameters that can be used to assess the validity of the velocity and / or discharge measurement. These parameters must identify when conditions violate limits of the system, thus threatening data integrity, i.e. Low signal correlation, unusually strong increases in signal intensity, high error velocities and uncertainty of water depth.
- e) The following measurement accuracies will apply:
 - Velocity measurement range of between 0.0 m/s and 5.0 m/s.
 - Velocity accuracy of $\pm 0.5\%$ of measured velocity.
 - The current should be measured in depth cells of a minimum of 10 cm., or better.
 - Compass / tilt sensor resolution: 0.1 °;
 - Compass / tilt sensor precision: 1 °;
 - Compass / tilt sensor pitch accuracy: 1 °;
 - Compass / tilt sensor heading accuracy: 0.1 °;
- f) The instrument should be able to operate within the following environmental

conditions: 0°C to 30°C (water temperature) and -5 °C to 45 °C (air temperature).

- g) The instrument should have a built-in temperature sensor, which can measure between -2°C to 30°C with an accuracy of 0.5°C or better.
- h) The option must be provided to upgrade the existing system to the latest available system by upgrading the Acoustic Doppler Current Profiler individually.

5.3 Power Supply:



- a) The power supply for the profiler and communication system should be commercially available dry cell battery / batteries or rechargeable sealed lead-acid battery / batteries.
- b) The power switch to power up the complete system should be placed on the boat in such a manner that it has easy access to the operator – no unscrewing of lids, etc.
- c) The instrument should measure continuously for a period of 10 hours using an external 8-amp hour sealed, lead-acid battery.
- d) Provision must be provided to protect against damage in the event of reverse polarity connection. In the event of such a connection, it should not be necessary to open the water-tight case to replace fuses or to reset the profiler.
- e) The option must be provided to upgrade the existing system to the latest available system by upgrading the power module individually.

5.4 Communication-, Cable- and Connector requirements:



- a) The profiler shall be equipped with a data interface that conforms to the referenced industry standard EIA-232-D. Communication with the computer for purposes of setup and data acquisition shall be conducted through this interface.
- b) Communication rates as low as 9 600 baud and at least as high as 115 200 baud shall be supported. The user shall be able to specify the communication rate for data acquisition.
- c) The profiler shall connect directly to its primary battery source and to the computer through a single, fully removable cable.
- d) The cable shall be no longer than needed for use in a small boat, approximately 3 m, with longer versions of up to 30 m offered as an option.
- e) The cable shall connect to the profiler through a keyed, self-purging, waterproof connector.
- f) The connector shall use a robust keying mechanism that will not easily degrade over time by the effects of frequent connect-disconnect cycles.
- g) The option must be provided to upgrade the existing system to the latest available system by upgrading the communications module individually.

5.5 User Interface / Software:

Software is required to interact with the profiler in real-time, to configure the profiler, and to display the results of measurement made with the profiler.



a) Computer Compatibility:

- The software should run on a standard operating system, at least Windows 95/98, Windows NT, Windows 2000 and Windows XP.



- The software shall be written in such a way that screen updates from the ADCP are displayed quickly enough to not interfere with the interpretation of the data being collected and resulting discharge being measured. ☐
- b) Profiler Firmware:
- The profiler firmware updates, should it be deemed necessary, should be made by using some form of communications software and without requiring the user to open the profiler case. ☐
- c) System Configuration:
- The user shall be able to use the software to configure the profiler and the software in preparation for discharge measurements. The user shall also be able to review and edit all information that has been entered for a measurement in a file for documentation purposes, and so that it may be used for other measurements. ☐
 - The user shall be able to review and edit imported information prior to conducting measurement. ☐
- d) Diagnostic Tests:
- Provision should be made in the software program for real-time and / or post-measurement diagnostics test. Such tests should verify that the various system components are operating properly and the data being collected are suitable for an accurate determination of discharge.
- e) Real-Time Calculations:
- The program shall perform the calculations required to determine discharge from the data acquired from the ADCP, including the following:
 - Measured discharge for each depth cell;
 - Unmeasured, but estimated, discharges near to the surface and bottom.
 - The estimated discharge for both the left and right banks, and
 - Summation of the total discharge measured to this point.
 - Above estimated discharges shall be derived from commonly accepted and hydraulically sound methods.
- f) Real-Time Displays:
- The program shall provide display options for the user to observe the progress of ongoing measurements and monitor the status and quality of data being collected.
- g) Text Displays:
- The following minimum data will be displayed:
 - Velocity and Discharge for each ensemble and depth cell.
 - Signal intensity for each ensemble and depth cell.

- Boat velocity, heading, pitch & roll and depth information for each ensemble.
- Discharge measurement summary for each measurement, which could consist of four or more transects.
- The discharge measurement summary shall be updated with each acquired data ensemble and shall include the following:
 - Measurement number and location.
 - Configuration filename.
 - Data filenames.
 - Recording Status.
 - Course length and width.
 - Start and end dates and times.
 - Elapsed time.
 - Number of ensembles.
 - Cross-section areas.
 - Average depth.
 - Mean Flow Velocity
 - Discharge Summary

h) Graphics Displays:

- The following minimum graphics should be displayed:
 - Flow velocity profile.
 - Signal intensity profile.
 - Signal correlation profile.
 - Graphical depiction of method for velocity profile extrapolation.
 - Cross-section plots of flow velocity.
 - Cross-section plots of signal intensity.
 - Cross-section plots of signal correlation.
 - Boat path plots.
- Contours of the measured velocity over the width and depth of the cross-section shall also be displayed.

i) Discharge Measurement Summary:

- The program shall compile and store an original record of the data acquired and calculated for each discharge measurement. The discharge summary should include the following:
 - Data acquired from the current profiler.
 - Data acquired from any optional navigation instruments used with the ADCP, such as GPS or echo sounders.
 - Data calculated by the program.
 - Discharge measurement summary, including:
 - Time and date of measurement.
 - Location of measurement.
 - Total discharge.

- Bank-section discharge estimates.
- Surface-layer and Bottom-layer discharge estimates.
- Mean depth.
- Mean flow velocity magnitude and direction.
- Cross-section and path-section widths and areas.
- Setup configuration.
- Measurement notes.

j) Data Files:

- Data files shall be stored in a binary format that is compatible with the Data Acquisition software as well as any other utility programs available with this instrument.

5.6 Application Software. ☐

- a) A Software package for the automatic computation of discharge measurements, according to the relevant ISO & WMO standards, should be included within the hand-held unit and will be user friendly.
- b) All other parameters related to the profiler operation should be easy selectable by the user. This includes depth cell size, number of depth cells and averaging time for each profile.

5.7 Global Positioning System

- a) The instrument should include a GPS interface to receive GPS information and should be able to accept a NEMA GGA or NEMA VTG string. A good quality GPS receiver with accurate differential corrections for robust real-time operations with one second or faster update interval should be offered.

5.8 Accessories: ☐

- a) The appropriate data transfer cable for extracting data from the unit to another PC or Laptop, should be included in the offer. ☐
- b) The appropriate tools to service and connect the equipment should be included in the offer. ☐
- c) All equipment should be packed in suitable robust instrument carry case/s. ☐
- d) A profiler that could be fixed via a corrosion free bracket onto larger boats (3 – 5 m in length) should be offered as an optional item. ☐
- e) A remotely operated cableway vehicle should be offered as optional. ☐
- f) Optional carrying vessel: 1.0 m length for maximum 5.0 m/s velocity; ☐
- g) Optional carrying vessel: 1.3 m length for maximum 5.0 m/s velocity; ☐
- h) Optional carrying vessel: 0.8 m length for maximum 4.0 m/s velocity, adaptable for remote operation; ☐
- i) Optional carrying vessel: 1.0 m length for maximum 4.0 m/s velocity, adaptable for remote operation; ☐
- j) Optional modular package for remote operation.
- k) Optional modular package for remote operation and autonomous deployments.

- l) A fully remote control boat, not longer than 3.0 m, could be offered as an option. ☐
- m) The DGPS offer should include all registration / air-time / service provider fee/s for the bid period. ☐
- n) Software to eliminate discharge errors with the movement of river beds can be offered as an option. ☐
- o) A list of general spares / Services that are available on this instrument will be listed and priced in the Price Schedules – “Spares”. ☐

5. ACOUSTIC DOPPLER CURRENT PROFILER 4.

This instrument will make use of the Acoustic Doppler principle and will mainly be utilised in small streams / rivers.

Bottom tracking and Global Positioning should be performed by this instrument for discharge calculation.

5.1. Carrying Vessel:

- a) The vessel must be robust, corrosion resistant, stream lined and the hull design should preferably be of the Catamaran or Tri-maran type.
- b) The vessel shall be designed and be tested to be stable in rough water conditions and currents of up to 5 m/s.
- c) The vessel should preferably not exceed 1 500 mm length, 900 mm width and 10 kg weight (boat alone).
- d) The profiler shall be fitted to the vessel in such a manner that minimum damage to the profiler could be caused by any floating debris.
- e) The power supply and communication system shall be built into a compartment on/in the vessel and should be watertight.
- f) The option must be provided to upgrade the existing system to the latest available system by upgrading the carrying vessel individually.

5.2. Acoustic Doppler Current Profiler:

- a) The instrument body must be robust, corrosion resistant, water tight and insensitive to vibration.
- b) The instrument should include bottom tracking and must be able of measuring discharge accurately, within 1% of true water depth, in water depths of less than 7 m.
- c) The profiler should have a minimum of five transducer beams, operating between 0.5 MHz and 5 MHz.
- d) The instrument shall provide parameters that can be used to assess the validity of the velocity and / or discharge measurement. These parameters must identify when conditions violate limits of the system, thus threatening data integrity, i.e. Low signal correlation, unusually strong increases in signal intensity, high error velocities and uncertainty of water depth.
- e) The following measurement accuracies will apply:
 - Velocity measurement range of between 0.0 m/s and 5.0 m/s.
 - Velocity accuracy of $\pm 0.5\%$ of measured velocity.
 - The current should be measured in depth cells of a minimum of 10 cm., or better.
 - Compass / tilt sensor resolution: 0.1 °;
 - Compass / tilt sensor precision: 1 °;
 - Compass / tilt sensor pitch accuracy: 1 °;
 - Compass / tilt sensor heading accuracy: 0.1 °;
- f) The instrument should be able to operate within the following environmental

conditions: 0°C to 30°C (water temperature) and -5 °C to 45 °C (air temperature).

- g) The instrument should have a built-in temperature sensor, which can measure between -2°C to 30°C with an accuracy of 0.5°C or better.
- h) The option must be provided to upgrade the existing system to the latest available system by upgrading the Acoustic Doppler Current Profiler individually.

5.3. Power Supply:

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- a) The power supply for the profiler and communication system should be commercially available dry cell battery / batteries or rechargeable sealed lead-acid battery / batteries.
- b) The power switch to power up the complete system should be placed on the boat in such a manner that it has easy access to the operator – no unscrewing of lids, etc.
- c) Provision must be provided to protect against damage in the event of reverse polarity connection. In the event of such a connection, it should not be necessary to open the water-tight case to replace fuses or to reset the profiler.
- d) The option must be provided to upgrade the existing system to the latest available system by upgrading the power module individually.

5.4. Communication-, Cable- and Connector requirements:

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- a) The profiler shall be equipped with a data interface that conforms to the referenced industry standard EIA-232-D. Communication with the computer for purposes of setup and data acquisition shall be conducted through this interface.
- b) Communication rates as low as 9 600 baud and at least as high as 115 200 baud shall be supported. The user shall be able to specify the communication rate for data acquisition.
- c) The profiler shall connect directly to its primary battery source and to the computer through a single, fully removable cable.
- d) The cable shall be no longer than needed for use in a small boat, approximately 3 m, with longer versions of up to 30 m offered as an option.
- e) The cable shall connect to the profiler through a keyed, self-purging, waterproof connector.
- f) The connector shall use a robust keying mechanism that will not easily degrade over time by the effects of frequent connect-disconnect cycles.
- g) The option must be provided to upgrade the existing system to the latest available system by upgrading the communications module individually.

5.5. User Interface / Software:

Software is required to interact with the profiler in real-time, to configure the profiler, and to display the results of measurement made with the profiler.

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a) Computer Compatibility:

- The software should run on a standard operating system, at least Windows 95/98, Windows NT, Windows 2000 and Windows XP.
- The software shall be written in such a way that screen updates from the ADCP are displayed quickly enough to not interfere with the interpretation

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of the data being collected and resulting discharge being measured.

b) Profiler Firmware:

- The profiler firmware updates, should it be deemed necessary, should be made by using some form of communications software and without requiring the user to open the profiler case. ☐

c) System Configuration:

- The user shall be able to use the software to configure the profiler and the software in preparation for discharge measurements. The user shall also be able to review and edit all information that has been entered for a measurement in a file for documentation purposes, and so that it may be used for other measurements. ☐
- The user shall be able to review and edit imported information prior to conducting measurement. ☐

d) Diagnostic Tests:

- Provision should be made in the software program for real-time and / or post-measurement diagnostics test. Such tests should verify that the various system components are operating properly and the data being collected are suitable for an accurate determination of discharge.

e) Real-Time Calculations:

- The program shall perform the calculations required to determine discharge from the data acquired from the ADCP, including the following:
 - Measured discharge for each depth cell;
 - Unmeasured, but estimated, discharges near to the surface and bottom.
 - The estimated discharge for both the left and right banks, and
 - Summation of the total discharge measured to this point.
- Above estimated discharges shall be derived from commonly accepted and hydraulically sound methods.

f) Real-Time Displays:

- The program shall provide display options for the user to observe the progress of ongoing measurements and monitor the status and quality of data being collected.

g) Text Displays:

- The following minimum data will be displayed:
 - Velocity and Discharge for each ensemble and depth cell.
 - Signal intensity for each ensemble and depth cell.
 - Boat velocity, heading, pitch & roll and depth information for each ensemble.

- Discharge measurement summary for each measurement, which could consist of four or more transects.
- The discharge measurement summary shall be updated with each acquired data ensemble and shall include the following:
 - Measurement number and location.
 - Configuration filename.
 - Data filenames.
 - Recording Status.
 - Course length and width.
 - Start and end dates and times.
 - Elapsed time.
 - Number of ensembles.
 - Cross-section areas.
 - Average depth.
 - Mean Flow Velocity
 - Discharge Summary

h) Graphics Displays:

- The following minimum graphics should be displayed:
 - Flow velocity profile.
 - Signal intensity profile.
 - Signal correlation profile.
 - Graphical depiction of method for velocity profile extrapolation.
 - Cross-section plots of flow velocity.
 - Cross-section plots of signal intensity.
 - Cross-section plots of signal correlation.
 - Boat path plots.
- Contours of the measured velocity over the width and depth of the cross-section shall also be displayed.

i) Discharge Measurement Summary:

- The program shall compile and store an original record of the data acquired and calculated for each discharge measurement. The discharge summary should include the following:
 - Data acquired from the current profiler.
 - Data acquired from any optional navigation instruments used with the ADCP, such as GPS or echo sounders.
 - Data calculated by the program.
 - Discharge measurement summary, including:
 - Time and date of measurement.
 - Location of measurement.
 - Total discharge.
 - Bank-section discharge estimates.
 - Surface-layer and Bottom-layer discharge estimates.

- Mean depth.
- Mean flow velocity magnitude and direction.
- Cross-section and path-section widths and areas.
- Setup configuration.
- Measurement notes.

j) Data Files:

- Data files shall be stored in a binary format that is compatible with the Data Acquisition software as well as any other utility programs available with this instrument.

5.6. Application Software. ☐

- a) A Software package for the automatic computation of discharge measurements, according to the relevant ISO & WMO standards, should be included within the hand-held unit and will be user friendly.
- b) All other parameters related to the profiler operation should be easy selectable by the user. This includes depth cell size, number of depth cells and averaging time for each profile.

5.7. Global Positioning System

- a) The instrument should include a GPS interface to receive GPS information and should be able to accept a NEMA GGA or NEMA VTG string. A good quality GPS receiver with accurate differential corrections for robust real-time operations with one second or faster update interval should be offered.

5.9 Accessories: ☐

- a) The appropriate data transfer cable for extracting data from the unit to another PC or Laptop, should be included in the offer. ☐
- b) The appropriate tools to service and connect the equipment should be included in the offer. ☐
- c) All equipment should be packed in suitable robust instrument carry case/s. ☐
- d) A profiler that could be fixed via a corrosion free bracket onto larger boats (3 – 5 m in length) should be offered as an optional item. ☐
- e) A remotely operated cableway vehicle should be offered as optional. ☐
- f) Optional carrying vessel: 1.0 m length for maximum 5.0 m/s velocity; ☐
- g) Optional carrying vessel: 1.3 m length for maximum 5.0 m/s velocity; ☐
- h) Optional carrying vessel: 0.8 m length for maximum 4.0 m/s velocity, adaptable for remote operation; ☐
- i) Optional carrying vessel: 1.0 m length for maximum 4.0 m/s velocity, adaptable for remote operation; ☐
- j) Optional modular package for remote operation.
- k) Optional modular package for remote operation and autonomous deployments.
- l) A fully remote control boat, not longer than 3.0 m, could be offered as an option. ☐

- m) The DGPS offer should include all registration / air-time / service provider fee/s for the bid period. ☐
- n) Software to eliminate discharge errors with the movement of river beds can be offered as an option. ☐
- o) A list of general spares / Services that are available on this instrument will be listed and priced in the Price Schedules – “Spares”. ☐

SECTION 4: DETAIL SPECIFICATIONS

D. VANDAL RESISTANT EQUIPMENT HOUSING;

1. SCOPE:

This section makes provision for the supply of Vandal Resistant Equipment Housing manufactured from Stainless Steel that includes anti-vandalism/anti-tamper locking devices, on condition that they comply with the minimum specifications.

2. VANDAL RESISTANT EQUIPMENT HOUSING;

- 2.1. Custom size vandal resistant equipment hut door and frame with anti-tamper / ☐ anti-vandalism locking device:
- a) Daylight door opening of hut equal to: 1955mm x 825mm
 - b) Typical attacks that must be resisted includes, but are not limited to, hacksaws, large hammers, rocks, levers, insertion of foreign objects or tugging by a vehicle.
 - c) The locking device must not be damaged or rendered inoperable by vandals attempting to insert foreign objects into the device or forcefully attempting to open it.
 - d) The concrete huts typically have a 200mm reinforced concrete wall (30MPa), and the door strength should be in relative proportion to this.
 - e) Ease of installation and low or no maintenance would be considered advantageous features.
 - f) Interchange ability of the door and its sub-components must at all times be possible.
 - g) The door lock must be accessed from the front side (i.e. the opening panel) of the door.
 - h) A decoy (but working) 60mm padlock and padlock protection ring is required. No other protrusions except the dummy lock protection ring should extend from the door surface. Additional false security features should be included on the door to mislead potential attackers.
 - i) Surface finish protection and/or choice of material should be such that no components would rust and as a result render the door inoperable even after being totally submerged in dirty flood water with a high loading of debris such as plant material, sand and especially silt for prolonged periods of time.
 - j) The total door weight should be below 150kg, with a panel thickness of 8mm 300WA steel or more.
 - k) The door panel should be reinforced internally with stiffener panels.
 - l) The door frame should be of a steel construction in proportion to the door panel strength.
 - m) Hinge bolts should be hidden behind the door panel to prevent tampering with the hinges.
 - n) If the door frame pulls skew slightly during installation, adjustability is required to minimize the gap between the door panel and frame.
 - o) The opening side of the door should engage with the door frame at more than one

position with barrel bolts to prevent buckling of the door when subjected to extreme attempts to forcefully open it. Similarly, the hinge side of the door must engage with the frame.

- p) A small access panel is required in the door to pass an electrical extension cable through during the installation process, as the hut is totally enclosed with no internal power source.
- q) The door and its frame should be supplied with all fixtures and fittings and should be supplied in a wooden crate to withstand transportation and construction site environments.

2.2. Anti-Tamper / Anti-Vandalism equipment enclosures / cabinets in various sizes and with

various mounting options:

- a) The contents to be protected would require different volume rectangular enclosures on a per-order basis, with typically three standard volumes required (approximately 40L, 80L and 95L). ☐
- b) The locking device must not be damaged or rendered inoperable by vandals attempting to insert foreign objects into the device or forcefully attempting to open it. The device should withstand attacks ranging from hacksaws, levers, insertion of foreign devices into possible orifices and throwing the device with rocks weighing 10kgs from a distance of 3 meters. ☐
- c) The device should be adaptable in its mounting positions and methods, from being cast fully into concrete (except for the access panel/door) to being mounted in the open onto a standard pipe flange (various sizes). ☐
- d) The device should be easy to handle by construction and service personnel without using heavy lifting equipment, and be able to withstand continuous contact with polluted / contaminated water and the environment. ☐
- e) On a per-order basis, the device may be required to be fitted with a dual-band high-gain GSM antenna and fly leads terminating in the requested connectors. Vandals and thieves should not be able to damage the GSM antenna or the device to a state where it is rendered inoperable. ☐
- f) As one ordering option, the device must allow delicate equipment to be mounted horizontally (finely adjustable) over a pipe opening and from which both mechanical and electrical cables are suspended into the pipe opening. ☐
- g) With the device opened by service personnel, a small work bench is required where equipment used during the service can be placed for ease of use. ☐
- h) The device should have an expected service life in excess of 30 years and be resistant to chlorides and acids on a per order basis. ☐
- i) The device should be fitted with internal wooden mounting panels onto which equipment can be fixed to. ☐

- 2.3. Man-Hole cover door with Anti-Tamper / Anti-Vandalism locking device.
- a) Be slightly raised above the surrounding area so as to prevent normal rainwater from running into the shaft. ☐
 - b) Be resistant to complete and continuous submersion in contaminated / polluted water for prolonged periods of time without detrimental effect on the device or it's locking mechanism or operation. ☐
 - c) Make provision for staying the lid open securely at various angles to allow for the safety and security of working crews inside. A position to engage a padlock and thus lock the device in the open position is required so that work crews cannot accidentally be locked inside the enclosure. ☐
 - d) Mounting of the device must be either by casting it into the concrete of the shaft during installation, or retrofitting to existing concrete shafts, without having to do additional concrete work. ☐
 - e) The enclosure must provide ventilation to the shaft, without creating easily accessible openings where foreign objects can enter into the shaft. ☐
 - f) The enclosure must provide the top rung of a cat ladder to be mounted inside the shaft for easy access by service personnel. ☐
 - g) A service life in excess of 30 years is required.
- 2.4. Gauge Box - Protection device for sensors with anti-tamper locking device:
- a) The face of the device must not protrude from the concrete face within which it is mounted and must not cause unwanted turbulence or vibrations in the water flow. ☐
 - b) A lid for the device must be accessible perpendicular to the face of the device (i.e. at the top of the device) where the sensor(s) mounted inside can be accessed. The lid (and rest of the device) must be vandal and tamper resistant and must not be affected by prolonged exposure to water. ☐
 - c) The locking device must not be damaged or rendered inoperable by vandals attempting to insert foreign objects into the device or forcefully attempting to open it. ☐
 - d) At least two inlets for trunking (Diameter 80mm Class 4 HDPE pipes) must be provided in order to connect the sensor probe to other equipment situated away from it. The trunking is to be cast into the concrete during the time of installation. ☐
 - e) The trunking inlets must be adjustable to allow for misalignment and be able to point in opposite directions, directly perpendicular to the concrete wall face as well as 45 degrees into the wall, or parallel to the wall face, either left or right. Furthermore, after fitting the cable inlets with delicate sensor cables, the pipe trunking system must be sealed so as to not allow silt to enter into the pipe trunking system. ☐
 - f) The length of the device will vary greatly between one installation site and the next, and custom lengths will be specified for each order. ☐
 - g) The device must allow for multiple (optional) 1-inch water pipes to connect to the sensor cavity from the bottom rear as an option. ☐
 - h) The device must be easy to clean in the event that service teams find silt and ☐

debris inside of the device that will in most cases be present in the water. Furthermore, provision must be made to flush the device from dirty silt water via a remote tap and water pipe (2 ½ inch) connected to the bottom of the device.

- i) Water inside the device must not be turbulent, even if the water flow rate outside the device is high. ☐
- j) The sensors used are typically 30mm in diameter and 200mm long, with a cable exiting axially to the sensor. However, the device must be able to accommodate a special sensor of diameter 100mm and length 400mm to be mounted vertically. ☐
- k) Provision must be made for attachment points for the water sensor probes inside the device. In addition, electrically conductive points must be provided for electrical earthing of the sensor probes. ☐
- l) Construction of the device must be strong enough to withstand the hydrostatic forces exerted onto it should it be subjected to a continuous cast of 2.5m deep wet concrete. ☐
- m) A service life in excess of 30 years is required. ☐

2.5. Draw Box - Adjustable piping connector with multiple adjustable inlets and anti-tamper locking device.

- a) Provide a means whereby trunking pipes (Diameter 80mm Class 4 HDPE pipes) that are cast into concrete (approximately 150-250mm deep) can be connected from various angles and directions. The device lid will be cast flush with the concrete surface. Service personnel must be able to open and access the connection point formed from above to easily work on the contents of the trunking pipe system.
- b) The locking device must not be damaged or rendered inoperable by vandals attempting to insert foreign objects into the device or forcefully attempting to open it. Typical vandal attacks that must not damage the device include the use of hammers, rocks, levers, hacksaws and similar attempts. ☐
- c) The device must enable up to 7 trunking pipes to be connected simultaneously, with a possibility to point at least two pairs of inlets in the same direction, but also to point all inlets in different directions, should it be required. ☐
- d) Inlets that can swivel in order to allow for possible misalignment would be advantageous. ☐
- e) Construction teams must be able to remove / add / align the trunking inlets at will during installation. ☐
- f) The device and device lid must be vandal and tamper proof and must be of corrosion resistant material and be able to withstand continuous submersion in contaminated water, without affecting the enclosure or locking device operation. ☐
- g) It must be possible to mount the enclosure in any orientation. ☐
- h) After installation, the device should not protrude more than 15mm from the surface, and be resistant to light motor vehicle and foot traffic crossing over it. ☐
- i) A means of blocking off individual pipe entries after the cables are installed must be provided, so that silt and water (possibly) entering into the enclosure ☐

would not fill the trunking system. The sealing system should be of such design that it will not damage sensitive capillary tubes inside the sensor cables (6mm outside diameter), and must be replaceable without damaging the sensor cables. Multiple sensor cables may be required to pass through the same sealing device.

- j) The device must allow a removable 180mm x 250mm floor panel should it be mounted on a shaft, and additional (multiple) entry points for 22mm electrical PVC conduit pipes, should ancillary devices be mounted. ☐
- k) The device must be supplied with all fixtures and fittings, ready for installation. ☐
- l) A service life in excess of 30 years is required. ☐

SECTION 5: TECHNICAL SCHEDULES

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- 2. MULTI-CHANNEL DATA LOGGER;**
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- 6. MULTI-CHANNEL DATA LOGGER WITH INTEGRATED SENSORS: PRESSURE TRANSDUCER (VENTED) AND TEMPERATURE SENSOR;**
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41. **SENSOR FOR WEATHER MEASUREMENT: RAIN GAUGE, TIPPING BUCKET WITH INTEGRATED SYPHON MECHANISM (HIGH LEVELS OF ACCURACY), POWDER COATED ALUMINIUM ONLY:**
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- 62. BATTERY, SIZE C, ALKALINE TYPE, 1.5 VOLT,
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- 64. BATTERY, SIZE AAA, ALKALINE TYPE, 1.5 VOLT,
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- 67. POWER CONTROL UNIT OR MAINS TRANSFORMER:
- 68. BATTERY CHARGER:
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- 70. HANDHELD ACOUSTIC DOPPLER INSTRUMENT 2:
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- 72. ACOUSTIC DOPPLER CURRENT PROFILER 2;
- 73. ACOUSTIC DOPPLER CURRENT PROFILER 3;
- 74. ACOUSTIC DOPPLER CURRENT PROFILER 4;
- 75. VANDAL RESISTANT EQUIPMENT HOUSING;

NOTES:

- 1. Tick one box where applicable
- 2. Should the Bidder offer more than one Item and the information filled-in under any sub-heading, remains the same, the Bidder may refer to that paragraph that is completed already. He/she will however sign all relevant Sections.

TECHNICAL SCHEDULES FOR STAND-ALONE DATA LOGGING EQUIPMENT:

1. SINGLE CHANNEL DATA LOGGER:

1.1. GENERAL INFORMATION:

1.1.1. Existence of manufacturing company:years

1.1.2. Is Bidder an agency for equipment offered: ☐ YES ☐ NO

1.1.3. Is Bidder an affiliated company to the manufacturing company: ☐ YES ☐ NO

1.1.4. Is equipment offered, Hydrometry dedicated: ☐ YES ☐ NO

1.1.5. Is equipment offered field proven: ☐ YES ☐ NO

If the answer above, is YES, state the amount of years: years

1.1.6. Has manufacturing company been awarded an ISO 9001 certificate for quality assurance in:

Design/development, production, installation and servicing: ☐ YES ☐ NO

1.1.7. Any other Certification received? ☐ YES ☐ NO

If the answer above, is YES, Name the Certification:.....

1.1.8. Is original descriptive literature of the equipment offered, attached? ☐ YES ☐ NO

1.1.9. Are you aware of any impending modifications or development of new equipment on this item? ☐ YES ☐ NO

1.2. EQUIPMENT OFFERED:

1.2.1. Make:

1.2.2. Model:

1.2.3. Country of origin:.....

1.2.4. Should any other accessories be offered, please state the Make & Model:
(Excluding Power Supplies & Enclosures – To be listed in Paragraph 6 and Paragraph 7.)

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1.3. CONTRACT PROGRAMME, MAINTENANCE, BACK-UP AND GUARANTEE:

1.3.1. Delivery period for equipment after placing the order: weeks

1.3.2. Will all equipment be guaranteed and maintained for a period of 12 months from date of delivery?

| | |
|-----|----|
| YES | NO |
|-----|----|

- If the answer above, is NO, state the item/s excluded and the period of guarantee applicable

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1.3.3. List the address of location in the Republic of South Africa where equipment maintenance will be performed:

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1.3.4. Give a short description of the back-up service that will be provided:

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BIDDER'S SIGNATURE:

NAME OF BIDDER / COMPANY:

DATE:

2. MULTI-CHANNEL DATA LOGGER;

1.1. GENERAL INFORMATION:

1.1.1. Existence of manufacturing company:years

1.1.2. Is Bidder an agency for equipment offered: ☐ YES ☐ NO

1.1.3. Is Bidder an affiliated company to the manufacturing company: ☐ YES ☐ NO

1.1.4. Is equipment offered, Hydrometry dedicated: ☐ YES ☐ NO

1.1.5. Is equipment offered field proven: ☐ YES ☐ NO

If the answer above, is YES, state the amount of years: years

1.1.6. Has manufacturing company been awarded an ISO 9001 certificate for quality assurance in:

Design/development, production, installation and servicing: ☐ YES ☐ NO

1.1.7. Any other Certification received? ☐ YES ☐ NO

If the answer above, is YES, Name the Certification:.....

1.1.8. Is original descriptive literature of the equipment offered, attached? ☐ YES ☐ NO

1.1.9. Are you aware of any impending modifications or development of new equipment on this item? ☐ YES ☐ NO

1.2. EQUIPMENT OFFERED:

1.2.1. Make:

1.2.2. Model:

1.2.3. Country of origin:.....

1.2.4. Should any other accessories be offered, please state the Make & Model:
(Excluding Power Supplies & Enclosures – To be listed in Paragraph 6 and Paragraph 7.)

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1.3. CONTRACT PROGRAMME, MAINTENANCE, BACK-UP AND GUARANTEE:

1.3.1. Delivery period for equipment after placing the order: weeks

1.3.2. Will all equipment be guaranteed and maintained for a period of 12 months from date of delivery?

☐ YES ☐ NO

- If the answer above, is NO, state the item/s excluded and the period of guarantee applicable

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1.3.3. List the address of location in the Republic of South Africa where equipment maintenance will be performed:

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1.3.4. Give a short description of the back-up service that will be provided:

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BIDDER'S SIGNATURE:

NAME OF BIDDER / COMPANY:

DATE:

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TECHNICAL SCHEDULES FOR INTEGRATED DATA LOGGER WITH INTEGRATED SENSORS:

3. SINGLE CHANNEL DATA LOGGER WITH INTEGRATED SENSOR: SHAFT ENCODER;

3.1. GENERAL INFORMATION:

3.1.1. Existence of manufacturing company:years

3.1.2. Is Bidder an agency for equipment offered: ☐ YES ☐ NO

3.1.3. Is Bidder an affiliated company to the manufacturing company: ☐ YES ☐ NO

3.1.4. Is equipment offered, Hydrometry dedicated: ☐ YES ☐ NO

3.1.5. Is equipment offered field proven: ☐ YES ☐ NO

If the answer above, is YES, state the amount of years: years

3.1.6. Has manufacturing company been awarded an ISO 9001 certificate for quality assurance in:

Design/development, production, installation and servicing: ☐ YES ☐ NO

3.1.7. Any other Certification received? ☐ YES ☐ NO

If the answer above, is YES, Name the Certification:.....

3.1.8. Is original descriptive literature of the equipment offered, attached? ☐ YES ☐ NO

3.1.9. Are you aware of any impending modifications or development of new equipment on this item? ☐ YES ☐ NO

3.2. EQUIPMENT OFFERED:

3.2.1. Make:

3.2.2. Model:

3.2.3. Country of origin:.....

3.2.4. Should any other accessories be offered, please state the Make & Model:
(Excluding Power Supplies & Enclosures – To be listed in Paragraph 6 and Paragraph 7.)

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3.3. CONTRACT PROGRAMME, MAINTENANCE, BACK-UP AND GUARANTEE:

3.3.1. Delivery period for equipment after placing the order: weeks

3.3.2. Will all equipment be guaranteed and maintained for a period of 12 months from date of delivery?

☐ YES ☐ NO

- If the answer above, is NO, state the item/s excluded and the period of guarantee applicable

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3.3.3. List the address of location in the Republic of South Africa where equipment maintenance will be performed:

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3.3.4. Give a short description of the back-up service that will be provided:

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BIDDER'S SIGNATURE:

NAME OF BIDDER / COMPANY:

DATE:

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4. SINGLE CHANNEL DATA LOGGER WITH INTEGRATED SENSOR: PRESSURE TRANSDUCER (VENTED);

4.1. GENERAL INFORMATION:

4.1.1. Existence of manufacturing company:years

4.1.2. Is Bidder an agency for equipment offered: ☐ YES ☐ NO

4.1.3. Is Bidder an affiliated company to the manufacturing company: ☐ YES ☐ NO

4.1.4. Is equipment offered, Hydrometry dedicated: ☐ YES ☐ NO

4.1.5. Is equipment offered field proven: ☐ YES ☐ NO

If the answer above, is YES, state the amount of years: years

4.1.6. Has manufacturing company been awarded an ISO 9001 certificate for quality assurance in:

Design/development, production, installation and servicing: ☐ YES ☐ NO

4.1.7. Any other Certification received? ☐ YES ☐ NO

If the answer above, is YES, Name the Certification:.....

4.1.8. Is original descriptive literature of the equipment offered, attached? ☐ YES ☐ NO

4.1.9. Are you aware of any impending modifications or development of new equipment on this item? ☐ YES ☐ NO

4.2. EQUIPMENT OFFERED:

4.2.1. Make:

4.2.2. Model:

4.2.3. Country of origin:.....

4.2.4. Should any other accessories be offered, please state the Make & Model:
(Excluding Power Supplies & Enclosures – To be listed in Paragraph 6 and Paragraph 7.)

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4.3. CONTRACT PROGRAMME, MAINTENANCE, BACK-UP AND GUARANTEE:

4.3.1. Delivery period for equipment after placing the order: weeks

4.3.2. Will all equipment be guaranteed and maintained for a period of 12 months from date of delivery?

| | |
|-----|----|
| YES | NO |
|-----|----|

- If the answer above, is NO, state the item/s excluded and the period of guarantee applicable

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4.3.3. List the address of location in the Republic of South Africa where equipment maintenance will be performed:

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4.3.4. Give a short description of the back-up service that will be provided:

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BIDDER'S SIGNATURE:

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NAME OF BIDDER / COMPANY:

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DATE:

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5. SINGLE CHANNEL DATA LOGGER WITH INTEGRATED SENSOR: BAROMETRIC PRESSURE;

5.1. GENERAL INFORMATION:

5.1.1. Existence of manufacturing company:years

5.1.2. Is Bidder an agency for equipment offered: ☐ YES ☐ NO

5.1.3. Is Bidder an affiliated company to the manufacturing company: ☐ YES ☐ NO

5.1.4. Is equipment offered, Hydrometry dedicated: ☐ YES ☐ NO

5.1.5. Is equipment offered field proven: ☐ YES ☐ NO

If the answer above, is YES, state the amount of years:..... years

5.1.6. Has manufacturing company been awarded an ISO 9001 certificate for quality assurance in:

Design/development, production, installation and servicing: ☐ YES ☐ NO

5.1.7. Any other Certification received? ☐ YES ☐ NO

If the answer above, is YES, Name the Certification:.....

5.1.8. Is original descriptive literature of the equipment offered, attached? ☐ YES ☐ NO

5.1.9. Are you aware of any impending modifications or development of new equipment on this item? ☐ YES ☐ NO

5.2. EQUIPMENT OFFERED:

5.2.1. Make:

5.2.2. Model:

5.2.3. Country of origin:.....

5.2.4. Should any other accessories be offered, please state the Make & Model:
(Excluding Power Supplies & Enclosures – To be listed in Paragraph 6 and Paragraph 7.)

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5.3. CONTRACT PROGRAMME, MAINTENANCE, BACK-UP AND GUARANTEE:

5.3.1. Delivery period for equipment after placing the order:weeks

5.3.2. Will all equipment be guaranteed and maintained for a period of 12 months from date of delivery?

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|-----|----|
| YES | NO |
|-----|----|

- If the answer above, is NO, state the item/s excluded and the period of guarantee applicable

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5.3.3. List the address of location in the Republic of South Africa where equipment maintenance will be performed:

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5.3.4. Give a short description of the back-up service that will be provided:

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BIDDER'S SIGNATURE:

NAME OF BIDDER / COMPANY:

DATE:

6. MULTI-CHANNEL DATA LOGGER WITH INTEGRATED SENSORS: PRESSURE TRANSDUCER (VENTED) AND TEMPERATURE SENSOR;

6.1. GENERAL INFORMATION:

6.1.1. Existence of manufacturing company:years

6.1.2. Is Bidder an agency for equipment offered: ☐ YES ☐ NO

6.1.3. Is Bidder an affiliated company to the manufacturing company: ☐ YES ☐ NO

6.1.4. Is equipment offered, Hydrometry dedicated: ☐ YES ☐ NO

6.1.5. Is equipment offered field proven: ☐ YES ☐ NO

If the answer above, is YES, state the amount of years:..... years

6.1.6. Has manufacturing company been awarded an ISO 9001 certificate for quality assurance in:

Design/development, production, installation and servicing: ☐ YES ☐ NO

6.1.7. Any other Certification received? ☐ YES ☐ NO

If the answer above, is YES, Name the Certification:.....

6.1.8. Is original descriptive literature of the equipment offered, attached? ☐ YES ☐ NO

6.1.9. Are you aware of any impending modifications or development of new equipment on this item? ☐ YES ☐ NO

6.2. EQUIPMENT OFFERED:

6.2.1. Make:

6.2.2. Model:

6.2.3. Country of origin:.....

6.2.4. Should any other accessories be offered, please state the Make & Model:
(Excluding Power Supplies & Enclosures – To be listed in Paragraph 6 and Paragraph 7.)

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6.3. CONTRACT PROGRAMME, MAINTENANCE, BACK-UP AND GUARANTEE:

6.3.1. Delivery period for equipment after placing the order:..... weeks

6.3.2. Will all equipment be guaranteed and maintained for a period of 12 months from date of delivery? YES NO

- If the answer above, is NO, state the item/s excluded and the period of guarantee applicable

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6.3.3. List the address of location in the Republic of South Africa where equipment maintenance will be performed:

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6.3.4. Give a short description of the back-up service that will be provided:

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BIDDER'S SIGNATURE:

NAME OF BIDDER / COMPANY:

DATE:

7. MULTI-CHANNEL DATA LOGGER WITH INTEGRATED SENSORS: PRESSURE TRANSDUCER (VENTED) AND TEMPERATURE SENSOR WITH INTEGRATED GSM MODEM;

7.1. GENERAL INFORMATION:

7.1.1. Existence of manufacturing company:years

7.1.2. Is Bidder an agency for equipment offered: ☐ YES ☐ NO

7.1.3. Is Bidder an affiliated company to the manufacturing company: ☐ YES ☐ NO

7.1.4. Is equipment offered, Hydrometry dedicated: ☐ YES ☐ NO

7.1.5. Is equipment offered field proven: ☐ YES ☐ NO

If the answer above, is YES, state the amount of years:..... years

7.1.6. Has manufacturing company been awarded an ISO 9001 certificate for quality assurance in:

Design/development, production, installation and servicing: ☐ YES ☐ NO

7.1.7. Any other Certification received? ☐ YES ☐ NO

If the answer above, is YES, Name the Certification:.....

7.1.8. Is original descriptive literature of the equipment offered, attached? ☐ YES ☐ NO

7.1.9. Are you aware of any impending modifications or development of new equipment on this item? ☐ YES ☐ NO

7.2. EQUIPMENT OFFERED:

7.2.1. Make:

7.2.2. Model:

7.2.3. Country of origin:.....

7.2.4. Should any other accessories be offered, please state the Make & Model:
(Excluding Power Supplies & Enclosures – To be listed in Paragraph 6 and Paragraph 7.)

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7.3. CONTRACT PROGRAMME, MAINTENANCE, BACK-UP AND GUARANTEE:

7.3.1. Delivery period for equipment after placing the order:weeks

7.3.2. Will all equipment be guaranteed and maintained for a period of 12 months from date of delivery?

☐ YES ☐ NO

- If the answer above, is NO, state the item/s excluded and the period of guarantee applicable

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7.3.3. List the address of location in the Republic of South Africa where equipment maintenance will be performed:

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7.3.4. Give a short description of the back-up service that will be provided:

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BIDDER'S SIGNATURE:

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NAME OF BIDDER / COMPANY:

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DATE:

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8. MULTI-CHANNEL DATA LOGGER WITH INTEGRATED SENSORS: PRESSURE TRANSDUCER (VENTED), TEMPERATURE- AND CONDUCTIVITY SENSOR WITH INTEGRATED GSM MODEM;

8.1. GENERAL INFORMATION:

8.1.1. Existence of manufacturing company:years

8.1.2. Is Bidder an agency for equipment offered: ☐ YES ☐ NO

8.1.3. Is Bidder an affiliated company to the manufacturing company: ☐ YES ☐ NO

8.1.4. Is equipment offered, Hydrometry dedicated: ☐ YES ☐ NO

8.1.5. Is equipment offered field proven: ☐ YES ☐ NO

If the answer above, is YES, state the amount of years:years

8.1.6. Has manufacturing company been awarded an ISO 9001 certificate for quality assurance in:

Design/development, production, installation and servicing: ☐ YES ☐ NO

8.1.7. Any other Certification received? ☐ YES ☐ NO

If the answer above, is YES, Name the Certification:.....

8.1.8. Is original descriptive literature of the equipment offered, attached? ☐ YES ☐ NO

8.1.9. Are you aware of any impending modifications or development of new equipment on this item? ☐ YES ☐ NO

8.2. EQUIPMENT OFFERED:

8.2.1. Make:

8.2.2. Model:

8.2.3. Country of origin:.....

8.2.4. Should any other accessories be offered, please state the Make & Model:
(Excluding Power Supplies & Enclosures – To be listed in Paragraph 6 and Paragraph 7.)

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8.3. CONTRACT PROGRAMME, MAINTENANCE, BACK-UP AND GUARANTEE:

8.3.1. Delivery period for equipment after placing the order:..... weeks

8.3.2. Will all equipment be guaranteed and maintained for a period of 12 months from date of delivery?

| | |
|-----|----|
| YES | NO |
|-----|----|

- If the answer above, is NO, state the item/s excluded and the period of guarantee applicable

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8.3.3. List the address of location in the Republic of South Africa where equipment maintenance will be performed:

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8.3.4. Give a short description of the back-up service that will be provided:

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BIDDER'S SIGNATURE:

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NAME OF BIDDER / COMPANY:

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DATE:

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9. MULTI-CHANNEL DATA LOGGER WITH INTEGRATED SENSORS: PRESSURE TRANSDUCER (NON-VENTED) AND TEMPERATURE SENSOR.

9.1. GENERAL INFORMATION:

9.1.1. Existence of manufacturing company:years

9.1.2. Is Bidder an agency for equipment offered: ☐ YES ☐ NO

9.1.3. Is Bidder an affiliated company to the manufacturing company: ☐ YES ☐ NO

9.1.4. Is equipment offered, Hydrometry dedicated: ☐ YES ☐ NO

9.1.5. Is equipment offered field proven: ☐ YES ☐ NO

If the answer above, is YES, state the amount of years:..... years

9.1.6. Has manufacturing company been awarded an ISO 9001 certificate for quality assurance in:

Design/development, production, installation and servicing: ☐ YES ☐ NO

9.1.7. Any other Certification received? ☐ YES ☐ NO

If the answer above, is YES, Name the Certification:.....

9.1.8. Is original descriptive literature of the equipment offered, attached? ☐ YES ☐ NO

9.1.9. Are you aware of any impending modifications or development of new equipment on this item? ☐ YES ☐ NO

9.2. EQUIPMENT OFFERED:

9.2.1. Make:

9.2.2. Model:

9.2.3. Country of origin:.....

9.2.4. Should any other accessories be offered, please state the Make & Model:
(Excluding Power Supplies & Enclosures – To be listed in Paragraph 6 and Paragraph 7.)

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9.3. CONTRACT PROGRAMME, MAINTENANCE, BACK-UP AND GUARANTEE:

9.3.1. Delivery period for equipment after placing the order:..... weeks

9.3.2. Will all equipment be guaranteed and maintained for a period of 12 months from date of delivery?

| | |
|-----|----|
| YES | NO |
|-----|----|

- If the answer above, is NO, state the item/s excluded and the period of guarantee applicable

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9.3.3. List the address of location in the Republic of South Africa where equipment maintenance will be performed:

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9.3.4. Give a short description of the back-up service that will be provided:

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BIDDER'S SIGNATURE:

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NAME OF BIDDER / COMPANY:

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DATE:

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10. MULTI-CHANNEL DATA LOGGER WITH INTEGRATED SENSORS: PRESSURE TRANSDUCER (NON-VENTED) AND TEMPERATURE SENSOR; WITH BAROMETRIC PRESSURE COMPENSATOR.

10.1. GENERAL INFORMATION:

10.1.1. Existence of manufacturing company:years E

10.1.2. Is Bidder an agency for equipment offered: ☐ YES ☐ NO I

10.1.3. Is Bidder an affiliated company to the manufacturing company: ☐ YES ☐ NO I

10.1.4. Is equipment offered, Hydrometry dedicated: ☐ YES ☐ NO I

10.1.5. Is equipment offered field proven: ☐ YES ☐ NO I

If the answer above, is YES, state the amount of years:.....years

10.1.6. Has manufacturing company been awarded an ISO 9001 certificate for quality assurance in: H

Design/development, production, installation and servicing: ☐ YES ☐ NO

10.1.7. Any other Certification received? ☐ YES ☐ NO A

If the answer above, is YES, Name the Certification:.....

10.1.8. Is original descriptive literature of the equipment offered, attached? ☐ YES ☐ NO

10.1.9. Are you aware of any impending modifications or development of new equipment on this item? ☐ YES ☐ NO

10.2. EQUIPMENT OFFERED:

10.2.1. Make: M

10.2.2. Model: M

10.2.3. Country of origin: C

10.2.4.

S

Should any other accessories be offered, please state the Make & Model:
(Excluding Power Supplies & Enclosures – To be listed in Paragraph 6 and
Paragraph 7.)

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10.3. CONTRACT PROGRAMME, MAINTENANCE, BACK-UP AND GUARANTEE:

10.3.1.

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Delivery period for equipment after placing the order:..... weeks

10.3.2.

W

Will all equipment be guaranteed and maintained for a period of 12 months from
date of delivery? ☐ YES ☐ NO

- If the answer above, is NO, state the item/s excluded and the period of
guarantee applicable

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10.3.3.

L

List the address of location in the Republic of South Africa where equipment
maintenance will be performed:

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10.3.4. G
ive a short description of the back-up service that will be provided:

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BIDDER'S SIGNATURE:

NAME OF BIDDER / COMPANY:

DATE:

11. MULTI-CHANNEL DATA LOGGER WITH INTEGRATED SENSORS: PRESSURE TRANSDUCER (NON-VENTED), TEMPERATURE- AND CONDUCTIVITY SENSOR.

11.1. GENERAL INFORMATION:

11.1.1. Existence of manufacturing company:years E

11.1.2. Is Bidder an agency for equipment offered: ☐ YES ☐ NO I

11.1.3. Is Bidder an affiliated company to the manufacturing company: ☐ YES ☐ NO I

11.1.4. Is equipment offered, Hydrometry dedicated: ☐ YES ☐ NO I

11.1.5. Is equipment offered field proven: ☐ YES ☐ NO I

If the answer above, is YES, state the amount of years:.....years

11.1.6. Has manufacturing company been awarded an ISO 9001 certificate for quality assurance in: H

Design/development, production, installation and servicing: ☐ YES ☐ NO

11.1.7. Any other Certification received? ☐ YES ☐ NO A

If the answer above, is YES, Name the Certification:.....

11.1.8. Is original descriptive literature of the equipment offered, attached? ☐ YES ☐ NO

11.1.9. Are you aware of any impending modifications or development of new equipment on this item? ☐ YES ☐ NO

11.2. EQUIPMENT OFFERED:

11.2.1. Make: M

11.2.2. Model: M

11.2.3. Country of origin: C

11.2.4.

S

Should any other accessories be offered, please state the Make & Model:
(Excluding Power Supplies & Enclosures – To be listed in Paragraph 6 and
Paragraph 7.)

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11.3. CONTRACT PROGRAMME, MAINTENANCE, BACK-UP AND GUARANTEE:

11.3.1.

D

Delivery period for equipment after placing the order:..... weeks

11.3.2.

W

Will all equipment be guaranteed and maintained for a period of 12 months from
date of delivery? ☐ YES ☐ NO

- If the answer above, is NO, state the item/s excluded and the period of
guarantee applicable

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11.3.3.

L

List the address of location in the Republic of South Africa where equipment
maintenance will be performed:

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11.3.4.

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ive a short description of the back-up service that will be provided:

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BIDDER'S SIGNATURE:

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NAME OF BIDDER / COMPANY:

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DATE:

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12. MULTI-CHANNEL DATA LOGGER WITH INTEGRATED SENSORS: PRESSURE TRANSDUCER (NON-VENTED), TEMPERATURE- AND CONDUCTIVITY SENSOR; WITH BAROMETRIC PRESSURE COMPENSATOR:

12.1. GENERAL INFORMATION:

12.1.1. Existence of manufacturing company:years E

12.1.2. Is Bidder an agency for equipment offered: ☐ YES ☐ NO I

12.1.3. Is Bidder an affiliated company to the manufacturing company: ☐ YES ☐ NO I

12.1.4. Is equipment offered, Hydrometry dedicated: ☐ YES ☐ NO I

12.1.5. Is equipment offered field proven: ☐ YES ☐ NO I

If the answer above, is YES, state the amount of years:.....years

12.1.6. Has manufacturing company been awarded an ISO 9001 certificate for quality assurance in: H

Design/development, production, installation and servicing: ☐ YES ☐ NO

12.1.7. Any other Certification received? ☐ YES ☐ NO A

If the answer above, is YES, Name the Certification:.....

12.1.8. Is original descriptive literature of the equipment offered, attached? ☐ YES ☐ NO

12.1.9. Are you aware of any impending modifications or development of new equipment on this item? ☐ YES ☐ NO

12.2. EQUIPMENT OFFERED:

12.2.1. Make: M

12.2.2. Model: M

12.2.3. Country of origin: C

12.2.4.

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Should any other accessories be offered, please state the Make & Model:
(Excluding Power Supplies & Enclosures – To be listed in Paragraph 6 and
Paragraph 7.)

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12.3. CONTRACT PROGRAMME, MAINTENANCE, BACK-UP AND GUARANTEE:

12.3.1.

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Delivery period for equipment after placing the order:..... weeks

12.3.2.

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Will all equipment be guaranteed and maintained for a period of 12 months from
date of delivery? ☐ YES ☐ NO

- If the answer above, is NO, state the item/s excluded and the period of
guarantee applicable

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12.3.3.

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List the address of location in the Republic of South Africa where equipment
maintenance will be performed:

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12.3.4. G
ive a short description of the back-up service that will be provided:

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BIDDER'S SIGNATURE:

NAME OF BIDDER / COMPANY:

DATE:

13. MULTI-CHANNEL DATA LOGGER WITH INTEGRATED PRESSURE (NON-VENTED), TEMPERATURE AND CONDUCTIVITY SENSORS – FOR UNATTENDED DEPLOYMENT WITH NO CABLES ATTACHED:

13.1. GENERAL INFORMATION:

13.1.1. Existence of manufacturing company:years E

13.1.2. Is Bidder an agency for equipment offered: ☐ YES ☐ NO I

13.1.3. Is Bidder an affiliated company to the manufacturing company: ☐ YES ☐ NO I

13.1.4. Is equipment offered, Hydrometry dedicated: ☐ YES ☐ NO I

13.1.5. Is equipment offered field proven: ☐ YES ☐ NO I

If the answer above, is YES, state the amount of years:..... years

13.1.6. Has manufacturing company been awarded an ISO 9001 certificate for quality assurance in: H

Design/development, production, installation and servicing: ☐ YES ☐ NO

13.1.7. Any other Certification received? ☐ YES ☐ NO A

If the answer above, is YES, Name the Certification:.....

13.1.8. Is original descriptive literature of the equipment offered, attached? ☐ YES ☐ NO

13.1.9. Are you aware of any impending modifications or development of new equipment on this item? ☐ YES ☐ NO

13.2. EQUIPMENT OFFERED:

13.2.1. Make: M

13.2.2. Model: M

13.2.3. Country of origin: C

13.2.4.

S

Should any other accessories be offered, please state the Make & Model:
(Excluding Power Supplies & Enclosures – To be listed in Paragraph 6 and
Paragraph 7.)

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13.3. CONTRACT PROGRAMME, MAINTENANCE, BACK-UP AND GUARANTEE:

13.3.1.

D

Delivery period for equipment after placing the order:..... weeks

13.3.2.

W

Will all equipment be guaranteed and maintained for a period of 12 months from
date of delivery? ☐ YES ☐ NO

- If the answer above, is NO, state the item/s excluded and the period of
guarantee applicable

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13.3.3.

L

List the address of location in the Republic of South Africa where equipment
maintenance will be performed:

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13.3.4. G
ive a short description of the back-up service that will be provided:

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BIDDER'S SIGNATURE:

NAME OF BIDDER / COMPANY:

DATE:

14. MULTI-CHANNEL DATA LOGGER WITH INTEGRATED PRESSURE (NON-VENTED), TEMPERATURE AND CONDUCTIVITY SENSORS – FOR UNATTENDED DEPLOYMENT WITH NO CABLES ATTACHED:

14.1. GENERAL INFORMATION:

14.1.1. Existence of manufacturing company:years E

14.1.2. Is Bidder an agency for equipment offered: ☐ YES ☐ NO I

14.1.3. Is Bidder an affiliated company to the manufacturing company: ☐ YES ☐ NO I

14.1.4. Is equipment offered, Hydrometry dedicated: ☐ YES ☐ NO I

14.1.5. Is equipment offered field proven: ☐ YES ☐ NO I

If the answer above, is YES, state the amount of years:.....years

14.1.6. Has manufacturing company been awarded an ISO 9001 certificate for quality assurance in: H

Design/development, production, installation and servicing: ☐ YES ☐ NO

14.1.7. Any other Certification received? ☐ YES ☐ NO A

If the answer above, is YES, Name the Certification:.....

14.1.8. Is original descriptive literature of the equipment offered, attached? ☐ YES ☐ NO

14.1.9. Are you aware of any impending modifications or development of new equipment on this item? ☐ YES ☐ NO

14.2. EQUIPMENT OFFERED:

14.2.1. Make: M

14.2.2. Model: M

14.2.3. Country of origin: C

14.2.4.

S

Should any other accessories be offered, please state the Make & Model:
(Excluding Power Supplies & Enclosures – To be listed in Paragraph 6 and
Paragraph 7.)

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14.3. CONTRACT PROGRAMME, MAINTENANCE, BACK-UP AND GUARANTEE:

14.3.1.

D

Delivery period for equipment after placing the order:..... weeks

14.3.2.

W

Will all equipment be guaranteed and maintained for a period of 12 months from
date of delivery? ☐ YES ☐ NO

- If the answer above, is NO, state the item/s excluded and the period of
guarantee applicable

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14.3.3.

L

List the address of location in the Republic of South Africa where equipment
maintenance will be performed:

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14.3.4. G
ive a short description of the back-up service that will be provided:

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BIDDER'S SIGNATURE:

NAME OF BIDDER / COMPANY:

DATE:

15. MULTI-CHANNEL DATA LOGGER WITH INTEGRATED LEVEL, TEMPERATURE AND CONDUCTIVITY SENSORS – FOR PERMANENT SUBMERGED DEPLOYMENT WITH FIXED (NON-REMOVABLE) COMMUNICATION CABLE AND VENTED TUBE:

15.1. GENERAL INFORMATION:

15.1.1. Existence of manufacturing company:years E

15.1.2. Is Bidder an agency for equipment offered: ☐ YES ☐ NO I

15.1.3. Is Bidder an affiliated company to the manufacturing company: ☐ YES ☐ NO I

15.1.4. Is equipment offered, Hydrometry dedicated: ☐ YES ☐ NO I

15.1.5. Is equipment offered field proven: ☐ YES ☐ NO I

If the answer above, is YES, state the amount of years:.....years

15.1.6. Has manufacturing company been awarded an ISO 9001 certificate for quality assurance in: H

Design/development, production, installation and servicing: ☐ YES ☐ NO

15.1.7. Any other Certification received? ☐ YES ☐ NO A

If the answer above, is YES, Name the Certification:.....

15.1.8. Is original descriptive literature of the equipment offered, attached? ☐ YES ☐ NO

15.1.9. Are you aware of any impending modifications or development of new equipment on this item? ☐ YES ☐ NO

15.2. EQUIPMENT OFFERED:

15.2.1. Make: M

15.2.2. Model: M

15.2.3. Country of origin: C

15.2.4.

S

Should any other accessories be offered, please state the Make & Model:
(Excluding Power Supplies & Enclosures – To be listed in Paragraph 6 and
Paragraph 7.)

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15.3. CONTRACT PROGRAMME, MAINTENANCE, BACK-UP AND GUARANTEE:

15.3.1.

D

Delivery period for equipment after placing the order:..... weeks

15.3.2.

W

Will all equipment be guaranteed and maintained for a period of 12 months from
date of delivery? ☐ YES ☐ NO

- If the answer above, is NO, state the item/s excluded and the period of
guarantee applicable

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15.3.3.

L

List the address of location in the Republic of South Africa where equipment
maintenance will be performed:

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15.3.4. G
ive a short description of the back-up service that will be provided:

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BIDDER'S SIGNATURE:

NAME OF BIDDER / COMPANY:

DATE:

16. MULTI-CHANNEL DATA LOGGER WITH INTEGRATED SENSORS: PRESSURE TRANSDUCER (VENTED), TEMPERATURE- AND CONDUCTIVITY SENSOR.

16.1. GENERAL INFORMATION:

16.1.1. Existence of manufacturing company:years E

16.1.2. Is Bidder an agency for equipment offered: ☐ YES ☐ NO I

16.1.3. Is Bidder an affiliated company to the manufacturing company: ☐ YES ☐ NO I

16.1.4. Is equipment offered, Hydrometry dedicated: ☐ YES ☐ NO I

16.1.5. Is equipment offered field proven: ☐ YES ☐ NO I

If the answer above, is YES, state the amount of years:.....years

16.1.6. Has manufacturing company been awarded an ISO 9001 certificate for quality assurance in: H

Design/development, production, installation and servicing: ☐ YES ☐ NO

16.1.7. Any other Certification received? ☐ YES ☐ NO A

If the answer above, is YES, Name the Certification:.....

16.1.8. Is original descriptive literature of the equipment offered, attached? ☐ YES ☐ NO

16.1.9. Are you aware of any impending modifications or development of new equipment on this item? ☐ YES ☐ NO

16.2. EQUIPMENT OFFERED:

16.2.1. Make: M

16.2.2. Model: M

16.2.3. Country of origin: C

16.2.4.

S

Should any other accessories be offered, please state the Make & Model:
(Excluding Power Supplies & Enclosures – To be listed in Paragraph 6 and
Paragraph 7.)

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16.3. CONTRACT PROGRAMME, MAINTENANCE, BACK-UP AND GUARANTEE:

16.3.1.

D

Delivery period for equipment after placing the order:..... weeks

16.3.2.

W

Will all equipment be guaranteed and maintained for a period of 12 months from
date of delivery? ☐ YES ☐ NO

- If the answer above, is NO, state the item/s excluded and the period of
guarantee applicable

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16.3.3.

L

List the address of location in the Republic of South Africa where equipment
maintenance will be performed:

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16.3.4.

G

ive a short description of the back-up service that will be provided:

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BIDDER'S SIGNATURE:

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NAME OF BIDDER / COMPANY:

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DATE:

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17. MULTI-CHANNEL DATA LOGGER WITH INTEGRATED SENSORS: PRESSURE TRANSDUCER, TEMPERATURE- AND CONDUCTIVITY SENSOR, WITH BUILT-IN GPS AND BLUETOOTH COMMUNICATION:

17.1. GENERAL INFORMATION:

17.1.1. Existence of manufacturing company:years E

17.1.2. Is Bidder an agency for equipment offered: ☐ YES ☐ NO I

17.1.3. Is Bidder an affiliated company to the manufacturing company: ☐ YES ☐ NO I

17.1.4. Is equipment offered, Hydrometry dedicated: ☐ YES ☐ NO I

17.1.5. Is equipment offered field proven: ☐ YES ☐ NO I

If the answer above, is YES, state the amount of years:.....years

17.1.6. Has manufacturing company been awarded an ISO 9001 certificate for quality assurance in: H

Design/development, production, installation and servicing: ☐ YES ☐ NO

17.1.7. Any other Certification received? ☐ YES ☐ NO A

If the answer above, is YES, Name the Certification:.....

17.1.8. Is original descriptive literature of the equipment offered, attached? ☐ YES ☐ NO

17.1.9. Are you aware of any impending modifications or development of new equipment on this item? ☐ YES ☐ NO

17.2. EQUIPMENT OFFERED:

17.2.1. Make: M

17.2.2. Model: M

17.2.3. Country of origin: C

17.2.4.

S

Should any other accessories be offered, please state the Make & Model:
(Excluding Power Supplies & Enclosures – To be listed in Paragraph 6 and
Paragraph 7.)

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17.3. CONTRACT PROGRAMME, MAINTENANCE, BACK-UP AND GUARANTEE:

17.3.1.

D

Delivery period for equipment after placing the order:..... weeks

17.3.2.

W

Will all equipment be guaranteed and maintained for a period of 12 months from
date of delivery? ☐ YES ☐ NO

- If the answer above, is NO, state the item/s excluded and the period of
guarantee applicable

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17.3.3.

L

List the address of location in the Republic of South Africa where equipment
maintenance will be performed:

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17.3.4. G
ive a short description of the back-up service that will be provided:

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BIDDER'S SIGNATURE:

NAME OF BIDDER / COMPANY:

DATE:

18. MULTI-CHANNEL DATA LOGGER WITH INTEGRATED SENSORS: PRESSURE TRANSDUCER AND WATER VELOCITY MEASUREMENT FOR USE IN LARGE STREAMS;

18.1. GENERAL INFORMATION:

18.1.1. Existence of manufacturing company:years E

18.1.2. Is Bidder an agency for equipment offered: ☐ YES ☐ NO I

18.1.3. Is Bidder an affiliated company to the manufacturing company: ☐ YES ☐ NO I

18.1.4. Is equipment offered, Hydrometry dedicated: ☐ YES ☐ NO I

18.1.5. Is equipment offered field proven: ☐ YES ☐ NO I

If the answer above, is YES, state the amount of years:..... years

18.1.6. Has manufacturing company been awarded an ISO 9001 certificate for quality assurance in: H

Design/development, production, installation and servicing: ☐ YES ☐ NO

18.1.7. Any other Certification received? ☐ YES ☐ NO A

If the answer above, is YES, Name the Certification:.....

18.1.8. Is original descriptive literature of the equipment offered, attached? ☐ YES ☐ NO

18.1.9. Are you aware of any impending modifications or development of new equipment on this item? ☐ YES ☐ NO

18.2. EQUIPMENT OFFERED:

18.2.1. Make: M

18.2.2. Model: M

18.2.3. Country of origin: C

18.2.4.

S

Should any other accessories be offered, please state the Make & Model:
(Excluding Power Supplies & Enclosures – To be listed in Paragraph 6 and
Paragraph 7.)

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18.3. CONTRACT PROGRAMME, MAINTENANCE, BACK-UP AND GUARANTEE:

18.3.1.

D

Delivery period for equipment after placing the order:..... weeks

18.3.2.

W

Will all equipment be guaranteed and maintained for a period of 12 months from
date of delivery? ☐ YES ☐ NO

- If the answer above, is NO, state the item/s excluded and the period of
guarantee applicable

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18.3.3.

L

List the address of location in the Republic of South Africa where equipment
maintenance will be performed:

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18.3.4. G
ive a short description of the back-up service that will be provided:

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BIDDER'S SIGNATURE:

NAME OF BIDDER / COMPANY:

DATE:

19. MULTI-CHANNEL DATA LOGGER WITH INTEGRATED SENSORS: PRESSURE TRANSDUCER AND WATER VELOCITY MEASUREMENT FOR USE IN MEDIUM STREAMS;

19.1. GENERAL INFORMATION:

19.1.1.

Existence of manufacturing company:

.....years

E

19.1.2.

Is Bidder an agency for equipment offered:

YES

NO

I

19.1.3.

Is Bidder an affiliated company to the manufacturing company:

YES

NO

I

19.1.4.

Is equipment offered, Hydrometry dedicated:

YES

NO

I

19.1.5.

Is equipment offered field proven:

YES

NO

I

If the answer above, is YES, state the amount of years:.....years

19.1.6.

Has manufacturing company been awarded an ISO 9001 certificate for quality assurance in:

Design/development, production, installation and servicing:

YES

NO

YES

NO

A

19.1.7.

Any other Certification received?

If the answer above, is YES, Name the Certification:.....

19.1.8.

Is original descriptive literature of the equipment offered, attached?

YES

NO

19.1.9.

Are you aware of any impending modifications or development of new equipment on this item?

YES

NO

19.2. EQUIPMENT OFFERED:

19.2.1.

Make:

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M

19.2.2.

Model:

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M

19.2.3.

Country of origin:

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19.2.4.

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Should any other accessories be offered, please state the Make & Model:
(Excluding Power Supplies & Enclosures – To be listed in Paragraph 6 and
Paragraph 7.)

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19.3. CONTRACT PROGRAMME, MAINTENANCE, BACK-UP AND GUARANTEE:

19.3.1.

D

Delivery period for equipment after placing the order:..... weeks

19.3.2.

W

Will all equipment be guaranteed and maintained for a period of 12 months from
date of delivery? ☐ YES ☐ NO

- If the answer above, is NO, state the item/s excluded and the period of
guarantee applicable

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19.3.3.

L

List the address of location in the Republic of South Africa where equipment
maintenance will be performed:

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19.3.4. G
ive a short description of the back-up service that will be provided:

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BIDDER'S SIGNATURE:

NAME OF BIDDER / COMPANY:

DATE:

20. MULTI-CHANNEL DATA LOGGER WITH INTEGRATED SENSORS: PRESSURE TRANSDUCER AND WATER VELOCITY MEASUREMENT FOR USE IN SMALL STREAMS;

20.1. GENERAL INFORMATION:

20.1.1. Existence of manufacturing company:years E

20.1.2. Is Bidder an agency for equipment offered: ☐ YES ☐ NO I

20.1.3. Is Bidder an affiliated company to the manufacturing company: ☐ YES ☐ NO I

20.1.4. Is equipment offered, Hydrometry dedicated: ☐ YES ☐ NO I

20.1.5. Is equipment offered field proven: ☐ YES ☐ NO I

If the answer above, is YES, state the amount of years:.....years

20.1.6. Has manufacturing company been awarded an ISO 9001 certificate for quality assurance in: H

Design/development, production, installation and servicing: ☐ YES ☐ NO

20.1.7. Any other Certification received? ☐ YES ☐ NO A

If the answer above, is YES, Name the Certification:.....

20.1.8. Is original descriptive literature of the equipment offered, attached? ☐ YES ☐ NO

20.1.9. Are you aware of any impending modifications or development of new equipment on this item? ☐ YES ☐ NO

20.2. EQUIPMENT OFFERED:

20.2.1. Make: M

20.2.2. Model: M

20.2.3. Country of origin: C

20.2.4.

S

Should any other accessories be offered, please state the Make & Model:
(Excluding Power Supplies & Enclosures – To be listed in Paragraph 6 and
Paragraph 7.)

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20.3. CONTRACT PROGRAMME, MAINTENANCE, BACK-UP AND GUARANTEE:

20.3.1.

D

Delivery period for equipment after placing the order:..... weeks

20.3.2.

W

Will all equipment be guaranteed and maintained for a period of 12 months from
date of delivery? ☐ YES ☐ NO

- If the answer above, is NO, state the item/s excluded and the period of
guarantee applicable

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20.3.3.

L

List the address of location in the Republic of South Africa where equipment
maintenance will be performed:

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20.3.4.

G

ive a short description of the back-up service that will be provided:

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BIDDER'S SIGNATURE:

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NAME OF BIDDER / COMPANY:

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DATE:

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21. MULTI-CHANNEL DATA LOGGER WITH INTEGRATED SENSORS: PRESSURE TRANSDUCER AND WATER VELOCITY MEASUREMENT FOR USE IN SHALLOW STREAMS;

21.1. GENERAL INFORMATION:

21.1.1. Existence of manufacturing company:years E

21.1.2. Is Bidder an agency for equipment offered: ☐ YES ☐ NO I

21.1.3. Is Bidder an affiliated company to the manufacturing company: ☐ YES ☐ NO I

21.1.4. Is equipment offered, Hydrometry dedicated: ☐ YES ☐ NO I

21.1.5. Is equipment offered field proven: ☐ YES ☐ NO I

If the answer above, is YES, state the amount of years:.....years

21.1.6. Has manufacturing company been awarded an ISO 9001 certificate for quality assurance in: H

Design/development, production, installation and servicing: ☐ YES ☐ NO

21.1.7. Any other Certification received? ☐ YES ☐ NO A

If the answer above, is YES, Name the Certification:.....

21.1.8. Is original descriptive literature of the equipment offered, attached? ☐ YES ☐ NO

21.1.9. Are you aware of any impending modifications or development of new equipment on this item? ☐ YES ☐ NO

21.2. EQUIPMENT OFFERED:

21.2.1. Make: M

21.2.2. Model: M

21.2.3. Country of origin: C

21.2.4.

S

Should any other accessories be offered, please state the Make & Model:
(Excluding Power Supplies & Enclosures – To be listed in Paragraph 6 and
Paragraph 7.)

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21.3. CONTRACT PROGRAMME, MAINTENANCE, BACK-UP AND GUARANTEE:

21.3.1.

D

Delivery period for equipment after placing the order:..... weeks

21.3.2.

W

Will all equipment be guaranteed and maintained for a period of 12 months from
date of delivery? ☐ YES ☐ NO

- If the answer above, is NO, state the item/s excluded and the period of
guarantee applicable

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21.3.3.

L

List the address of location in the Republic of South Africa where equipment
maintenance will be performed:

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21.3.4. G
ive a short description of the back-up service that will be provided:

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BIDDER'S SIGNATURE:

NAME OF BIDDER / COMPANY:

DATE:

22. MULTI-CHANNEL DATA LOGGER WITH INTEGRATED SENSORS: WEATHER PARAMETERS;

22.1. GENERAL INFORMATION:

22.1.1. Existence of manufacturing company:years E

22.1.2. Is Bidder an agency for equipment offered: ☐ YES ☐ NO I

22.1.3. Is Bidder an affiliated company to the manufacturing company: ☐ YES ☐ NO I

22.1.4. Is equipment offered, Hydrometry dedicated: ☐ YES ☐ NO I

22.1.5. Is equipment offered field proven: ☐ YES ☐ NO I

If the answer above, is YES, state the amount of years:.....years

22.1.6. Has manufacturing company been awarded an ISO 9001 certificate for quality assurance in: H

Design/development, production, installation and servicing: ☐ YES ☐ NO

22.1.7. Any other Certification received? ☐ YES ☐ NO A

If the answer above, is YES, Name the Certification:.....

22.1.8. Is original descriptive literature of the equipment offered, attached? ☐ YES ☐ NO

22.1.9. Are you aware of any impending modifications or development of new equipment on this item? ☐ YES ☐ NO

22.2. EQUIPMENT OFFERED:

22.2.1. Make: M

22.2.2. Model: M

22.2.3. Country of origin: C

22.2.4.

S

Should any other accessories be offered, please state the Make & Model:
(Excluding Power Supplies & Enclosures – To be listed in Paragraph 6 and
Paragraph 7.)

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22.3. CONTRACT PROGRAMME, MAINTENANCE, BACK-UP AND GUARANTEE:

22.3.1.

D

Delivery period for equipment after placing the order:..... weeks

22.3.2.

W

Will all equipment be guaranteed and maintained for a period of 12 months from
date of delivery? ☐ YES ☐ NO

- If the answer above, is NO, state the item/s excluded and the period of
guarantee applicable

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22.3.3.

L

ist the address of location in the Republic of South Africa where equipment maintenance will be performed:

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22.3.4.

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ive a short description of the back-up service that will be provided:

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BIDDER'S SIGNATURE:

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NAME OF BIDDER / COMPANY:

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DATE:

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23. MULTI-CHANNEL DATA LOGGER FOR EXTERNAL SENSORS: 4-20 MA (VENTED PRESSURE TRANSDUCER) AND DIGITAL PULSE (RAINFALL); SUBMERSIBLE WITH INTERNAL BATTERY AND INTERNAL GSM MODEM;

23.1. GENERAL INFORMATION:

23.1.1. Existence of manufacturing company:years

23.1.2. Is Bidder an agency for equipment offered: ☐ YES ☐ NO

23.1.3. Is Bidder an affiliated company to the manufacturing company: ☐ YES ☐ NO

23.1.4. Is equipment offered, Hydrometry dedicated: ☐ YES ☐ NO

23.1.5. Is equipment offered field proven: ☐ YES ☐ NO

If the answer above, is YES, state the amount of years:.....years

23.1.6. H
as manufacturing company been awarded an ISO 9001 certificate for quality assurance in:

Design/development, production, installation and servicing: ☐ YES ☐ NO

23.1.7. A
ny other Certification received? ☐ YES ☐ NO

If the answer above, is YES, Name the Certification:.....

23.1.8. Is original descriptive literature of the equipment offered, attached? ☐ YES ☐ NO

23.1.9. Are you aware of any impending modifications or development of new equipment on this item? ☐ YES ☐ NO

23.2. EQUIPMENT OFFERED:

23.2.1. M
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23.2.2. M
odel:

23.2.3. C
ountry of origin:

23.2.4. S
ould any other accessories be offered, please state the Make & Model:
(Excluding Power Supplies & Enclosures – To be listed in Paragraph 6 and Paragraph 7.)

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23.3. CONTRACT PROGRAMME, MAINTENANCE, BACK-UP AND GUARANTEE:

23.3.1. D
delivery period for equipment after placing the order:..... weeks

23.3.2. W
Will all equipment be guaranteed and maintained for a period of 12 months from YES NO
date of delivery?

- If the answer above, is NO, state the item/s excluded and the period of guarantee applicable

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23.3.3. L
List the address of location in the Republic of South Africa where equipment maintenance will be performed:

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23.3.4.

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ive a short description of the back-up service that will be provided:

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BIDDER'S SIGNATURE:

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NAME OF BIDDER / COMPANY:

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DATE:

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24. MULTI-CHANNEL DATA LOGGER FOR EXTERNAL SENSORS: MULTIPLE; WITH DATA TRANSMISSION CAPABILITIES.

24.1. GENERAL INFORMATION:

24.1.1. Existence of manufacturing company:years **E**

24.1.2. Is Bidder an agency for equipment offered: ☐ YES ☐ NO **I**

24.1.3. Is Bidder an affiliated company to the manufacturing company: ☐ YES ☐ NO **I**

24.1.4. Is equipment offered, Hydrometry dedicated: ☐ YES ☐ NO **I**

24.1.5. Is equipment offered field proven: ☐ YES ☐ NO **I**

If the answer above, is YES, state the amount of years:.....years

24.1.6. Has manufacturing company been awarded an ISO 9001 certificate for quality assurance in: **H**

Design/development, production, installation and servicing: ☐ YES ☐ NO

24.1.7. Any other Certification received? ☐ YES ☐ NO **A**

If the answer above, is YES, Name the Certification:.....

24.1.8. Is original descriptive literature of the equipment offered, attached? ☐ YES ☐ NO

24.1.9. Are you aware of any impending modifications or development of new equipment on this item? ☐ YES ☐ NO

24.2. EQUIPMENT OFFERED:

24.2.1. Make: **M**

24.2.2. Model: **M**

24.2.3. Country of origin: **C**

24.2.4.

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Should any other accessories be offered, please state the Make & Model:
(Excluding Power Supplies & Enclosures – To be listed in Paragraph 6 and
Paragraph 7.)

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24.3. CONTRACT PROGRAMME, MAINTENANCE, BACK-UP AND GUARANTEE:

24.3.1.

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Delivery period for equipment after placing the order:..... weeks

24.3.2.

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Will all equipment be guaranteed and maintained for a period of 12 months from
date of delivery? ☐ YES ☐ NO

- If the answer above, is NO, state the item/s excluded and the period of
guarantee applicable

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24.3.3.

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ist the address of location in the Republic of South Africa where equipment maintenance will be performed:

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24.3.4.

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ive a short description of the back-up service that will be provided:

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BIDDER'S SIGNATURE:

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NAME OF BIDDER / COMPANY:

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DATE:

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TECHNICAL SCHEDULES FOR INTEGRATED DATA LOGGER WITH REMOVABLE WATER QUALITY SENSORS:

25. MULTI-PARAMETER WATER QUALITY SONDE WITH PH-, ELECTRICAL CONDUCTIVITY-, TEMPERATURE-, DEPTH AND OPTICAL OXYGEN SENSORS (BLUETOOTH COMMUNICATION CAPABILITY) – DIAMETER LESS THAN FIVE CENTIMETRES;

25.1. GENERAL INFORMATION:

25.1.1. Existence of manufacturing company:years E

25.1.2. Is Bidder an agency for equipment offered: ☐ YES ☐ NO I

25.1.3. Is Bidder an affiliated company to the manufacturing company: ☐ YES ☐ NO I

25.1.4. Is equipment offered, Hydrometry dedicated: ☐ YES ☐ NO I

25.1.5. Is equipment offered field proven: ☐ YES ☐ NO I

If the answer above, is YES, state the amount of years:.....years

25.1.6. Has manufacturing company been awarded an ISO 9001 certificate for quality assurance in: H

Design/development, production, installation and servicing: ☐ YES ☐ NO

25.1.7. Any other Certification received? ☐ YES ☐ NO A

If the answer above, is YES, Name the Certification:.....

25.1.8. Is original descriptive literature of the equipment offered, attached? ☐ YES ☐ NO

25.1.9. Are you aware of any impending modifications or development of new equipment on this item? ☐ YES ☐ NO

25.2. EQUIPMENT OFFERED:

25.2.1. Make: M

25.2.2. Model: M

25.2.3. Country of origin: C

25.2.4. Should any other accessories be offered, please state the Make & Model:
(Excluding Power Supplies & Enclosures – To be listed in Paragraph 6 and Paragraph 7.) S

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25.3. CONTRACT PROGRAMME, MAINTENANCE, BACK-UP AND GUARANTEE:

25.3.1. Delivery period for equipment after placing the order:..... weeks D

25.3.2. Will all equipment be guaranteed and maintained for a period of 12 months from date of delivery? YES NO W

- If the answer above, is NO, state the item/s excluded and the period of guarantee applicable

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25.3.3. List the address of location in the Republic of South Africa where equipment maintenance will be performed: L

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25.3.4.

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ive a short description of the back-up service that will be provided:

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BIDDER'S SIGNATURE:

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NAME OF BIDDER / COMPANY:

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DATE:

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26. DEEP WATER (MINIMUM 245M) MULTI-PARAMETER WATER QUALITY SONDE WITH OPTICAL AND SMART SENSOR TECHNOLOGY - DIAMETER LESS THAN FIVE CENTIMETRES;

26.1. GENERAL INFORMATION:

26.1.1. Existence of manufacturing company:years **E**

26.1.2. Is Bidder an agency for equipment offered: ☐ YES ☐ NO **I**

26.1.3. Is Bidder an affiliated company to the manufacturing company: ☐ YES ☐ NO **I**

26.1.4. Is equipment offered, Hydrometry dedicated: ☐ YES ☐ NO **I**

26.1.5. Is equipment offered field proven: ☐ YES ☐ NO **I**

If the answer above, is YES, state the amount of years:.....years

26.1.6. Has manufacturing company been awarded an ISO 9001 certificate for quality assurance in:

Design/development, production, installation and servicing: ☐ YES ☐ NO

26.1.7. Any other Certification received? ☐ YES ☐ NO

If the answer above, is YES, Name the Certification:.....

26.1.8. Is original descriptive literature of the equipment offered, attached? ☐ YES ☐ NO

26.1.9. Are you aware of any impending modifications or development of new equipment on this item? ☐ YES ☐ NO

26.2. EQUIPMENT OFFERED:

26.2.1. Make:

26.2.2. Model:

26.2.3. Country of origin:.....

26.2.4. Should any other accessories be offered, please state the Make & Model:
(Excluding Power Supplies & Enclosures – To be listed in Paragraph 6 and
Paragraph 7.)

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26.3. CONTRACT PROGRAMME, MAINTENANCE, BACK-UP AND GUARANTEE:

26.3.1. Delivery period for equipment after placing the order:..... weeks

26.3.2. Will all equipment be guaranteed and maintained for a period of 12 months from
date of delivery? YES NO

- If the answer above, is NO, state the item/s excluded and the period of
guarantee applicable

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26.3.3. List the address of location in the Republic of South Africa where equipment
maintenance will be performed:

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26.3.4. Give a short description of the back-up service that will be provided:

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BIDDER'S SIGNATURE:

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NAME OF BIDDER / COMPANY:

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DATE:

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27. DEEP WATER (MINIMUM 245M) MULTI-PARAMETER WATER QUALITY SONDE WITH OPTICAL AND SMART SENSOR TECHNOLOGY - DIAMETER LESS THAN NINE CENTIMETRES;

27.1. GENERAL INFORMATION:

27.1.1. Existence of manufacturing company:years **E**

27.1.2. Is Bidder an agency for equipment offered: ☐ YES ☐ NO **I**

27.1.3. Is Bidder an affiliated company to the manufacturing company: ☐ YES ☐ NO **I**

27.1.4. Is equipment offered, Hydrometry dedicated: ☐ YES ☐ NO **I**

27.1.5. Is equipment offered field proven: ☐ YES ☐ NO **I**

If the answer above, is YES, state the amount of years:.....years

27.1.6. Has manufacturing company been awarded an ISO 9001 certificate for quality assurance in:

Design/development, production, installation and servicing: ☐ YES ☐ NO

27.1.7. Any other Certification received? ☐ YES ☐ NO

If the answer above, is YES, Name the Certification:.....

27.1.8. Is original descriptive literature of the equipment offered, attached? ☐ YES ☐ NO

27.1.9. Are you aware of any impending modifications or development of new equipment on this item? ☐ YES ☐ NO

27.2. EQUIPMENT OFFERED:

27.2.1. Make:

27.2.2. Model:

27.2.3. Country of origin:.....

27.2.4. Should any other accessories be offered, please state the Make & Model:
(Excluding Power Supplies & Enclosures – To be listed in Paragraph 6 and Paragraph 7.)

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27.3. CONTRACT PROGRAMME, MAINTENANCE, BACK-UP AND GUARANTEE:

27.3.1. Delivery period for equipment after placing the order:..... weeks

27.3.2. Will all equipment be guaranteed and maintained for a period of 12 months from date of delivery?

☐ YES ☐ NO

- If the answer above, is NO, state the item/s excluded and the period of guarantee applicable

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27.3.3. List the address of location in the Republic of South Africa where equipment maintenance will be performed:

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27.3.4. Give a short description of the back-up service that will be provided:

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BIDDER'S SIGNATURE:

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NAME OF BIDDER / COMPANY:

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DATE:

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TECHNICAL SCHEDULES FOR HANDHELD WATER QUALITY DEVICES

28. MULTI-PARAMETER HANDHELD WATER QUALITY SYSTEM (WITH PH-, DISSOLVED OXYGEN-, ELECTRICAL CONDUCTIVITY- AND TEMPERATURE SENSOR)

28.1. GENERAL INFORMATION:

28.1.1. Existence of manufacturing company:years ^E

28.1.2. Is Bidder an agency for equipment offered: ☐ YES ☐ NO ^I

28.1.3. Is Bidder an affiliated company to the manufacturing company: ☐ YES ☐ NO ^I

28.1.4. Is equipment offered, Hydrometry dedicated: ☐ YES ☐ NO ^I

28.1.5. Is equipment offered field proven: ☐ YES ☐ NO ^I

If the answer above, is YES, state the amount of years:.....years

28.1.6. Has manufacturing company been awarded an ISO 9001 certificate for quality assurance in:

Design/development, production, installation and servicing: ☐ YES ☐ NO

28.1.7. Any other Certification received? ☐ YES ☐ NO

If the answer above, is YES, Name the Certification:.....

28.1.8. Is original descriptive literature of the equipment offered, attached? ☐ YES ☐ NO

28.1.9. Are you aware of any impending modifications or development of new equipment on this item? ☐ YES ☐ NO

28.2. EQUIPMENT OFFERED:

28.2.1. Make:

28.2.2. Model:

28.2.3. Country of origin:.....

28.2.4. Should any other accessories be offered, please state the Make & Model:
(Excluding Power Supplies & Enclosures – To be listed in Paragraph 6 and
Paragraph 7.)

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28.3. CONTRACT PROGRAMME, MAINTENANCE, BACK-UP AND GUARANTEE:

28.3.1. Delivery period for equipment after placing the order:..... weeks

28.3.2. Will all equipment be guaranteed and maintained for a period of 12 months from
date of delivery?

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| YES | NO |
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- If the answer above, is NO, state the item/s excluded and the period of
guarantee applicable

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28.3.3. List the address of location in the Republic of South Africa where equipment
maintenance will be performed:

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28.3.4. Give a short description of the back-up service that will be provided:

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BIDDER'S SIGNATURE:

NAME OF BIDDER / COMPANY:

DATE:

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29. MULTI-PARAMETER HANDHELD WATER QUALITY SYSTEM (WITH PH-, DISSOLVED OXYGEN-, ELECTRICAL CONDUCTIVITY- AND TEMPERATURE SENSOR) WITH WIRELESS SMART DEVICE DISPLAY CAPABILITY

29.1. GENERAL INFORMATION:

29.1.1. Existence of manufacturing company:years **E**

29.1.2. Is Bidder an agency for equipment offered: ☐ YES ☐ NO **I**

29.1.3. Is Bidder an affiliated company to the manufacturing company: ☐ YES ☐ NO **I**

29.1.4. Is equipment offered, Hydrometry dedicated: ☐ YES ☐ NO **I**

29.1.5. Is equipment offered field proven: ☐ YES ☐ NO **I**

If the answer above, is YES, state the amount of years:.....years

29.1.6. Has manufacturing company been awarded an ISO 9001 certificate for quality assurance in:

Design/development, production, installation and servicing: ☐ YES ☐ NO

29.1.7. Any other Certification received? ☐ YES ☐ NO

If the answer above, is YES, Name the Certification:.....

29.1.8. Is original descriptive literature of the equipment offered, attached? ☐ YES ☐ NO

29.1.9. Are you aware of any impending modifications or development of new equipment on this item? ☐ YES ☐ NO

29.2. EQUIPMENT OFFERED:

29.2.1. Make:

29.2.2. Model:

29.2.3. Country of origin:.....

29.2.4. Should any other accessories be offered, please state the Make & Model:
(Excluding Power Supplies & Enclosures – To be listed in Paragraph 6 and Paragraph 7.)

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29.3. CONTRACT PROGRAMME, MAINTENANCE, BACK-UP AND GUARANTEE:

29.3.1. Delivery period for equipment after placing the order:..... weeks

29.3.2. Will all equipment be guaranteed and maintained for a period of 12 months from date of delivery?

☐ YES ☐ NO

- If the answer above, is NO, state the item/s excluded and the period of guarantee applicable

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29.3.3. List the address of location in the Republic of South Africa where equipment maintenance will be performed:

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29.3.4. Give a short description of the back-up service that will be provided:

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BIDDER'S SIGNATURE:

NAME OF BIDDER / COMPANY:

DATE:

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TECHNICAL SCHEDULES FOR SENSORS

30. SENSOR FOR WATER LEVEL MEASUREMENT: SHAFT ENCODER.

30.1. GENERAL INFORMATION:

30.1.1. Existence of manufacturing company:years E

30.1.2. Is Bidder an agency for equipment offered: ☐ YES ☐ NO ☐

30.1.3. Is Bidder an affiliated company to the manufacturing company: ☐ YES ☐ NO ☐

30.1.4. Is equipment offered, Hydrometry dedicated: ☐ YES ☐ NO ☐

30.1.5. Is equipment offered field proven: ☐ YES ☐ NO ☐

If the answer above, is YES, state the amount of years:.....years

30.1.6. Has manufacturing company been awarded an ISO 9001 certificate for quality assurance in:

Design/development, production, installation and servicing: ☐ YES ☐ NO ☐

30.1.7. Any other Certification received? ☐ YES ☐ NO ☐

If the answer above, is YES, Name the Certification:.....

30.1.8. Is original descriptive literature of the equipment offered, attached? ☐ YES ☐ NO ☐

30.1.9. Are you aware of any impending modifications or development of new equipment on this item? ☐ YES ☐ NO ☐

30.2. EQUIPMENT OFFERED:

30.2.1. Make:

30.2.2. Model:

30.2.3. Country of origin:.....

30.2.4. Can the sensor be interfaced with the data loggers, as specified in this ☐ YES ☐ NO ☐

30.2.5. Should any other accessories be offered, please state the Make & Model:
(Excluding Power Supplies & Enclosures – To be listed in Paragraph 6 and
Paragraph 7.)

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30.3. CONTRACT PROGRAMME, MAINTENANCE, BACK-UP AND GUARANTEE:

30.3.1. Delivery period for equipment after placing the order:..... weeks

30.3.2. Will all equipment be guaranteed and maintained for a period of 12 months from
date of delivery?

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| YES | NO |
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- If the answer above, is NO, state the item/s excluded and the period of
guarantee applicable

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30.3.3. List the address of location in the Republic of South Africa where equipment
maintenance will be performed:

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30.3.4. Give a short description of the back-up service that will be provided:

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BIDDER'S SIGNATURE:

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DATE:

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31. SENSOR FOR WATER LEVEL MEASUREMENT: PRESSURE TRANSDUCER: PIEZO RESISTIVE SENSOR (STAINLESS STEEL) WITH 4-20MA OUTPUT.

31.1. GENERAL INFORMATION:

31.1.1. Existence of manufacturing company:years **E**

31.1.2. Is Bidder an agency for equipment offered: ☐ YES ☐ NO **I**

31.1.3. Is Bidder an affiliated company to the manufacturing company: ☐ YES ☐ NO **I**

31.1.4. Is equipment offered, Hydrometry dedicated: ☐ YES ☐ NO **I**

31.1.5. Is equipment offered field proven: ☐ YES ☐ NO **I**

If the answer above, is YES, state the amount of years:.....years

31.1.6. Has manufacturing company been awarded an ISO 9001 certificate for quality assurance in:

Design/development, production, installation and servicing: ☐ YES ☐ NO

31.1.7. Any other Certification received? ☐ YES ☐ NO

If the answer above, is YES, Name the Certification:.....

31.1.8. Is original descriptive literature of the equipment offered, attached? ☐ YES ☐ NO

31.1.9. Are you aware of any impending modifications or development of new equipment on this item? ☐ YES ☐ NO

31.2. EQUIPMENT OFFERED:

31.2.1. Make:

31.2.2. Model:

31.2.3. Country of origin:.....

31.2.4. Can the sensor be interfaced with the data loggers, as specified in this Bid? ☐ YES ☐ NO

31.2.5. Should any other accessories be offered, please state the Make & Model:
(Excluding Power Supplies & Enclosures – To be listed in Paragraph 6 and Paragraph 7.)

[illegible]

31.3.1. Delivery period for equipment after placing the order:..... weeks

31.3.2. Will all equipment be guaranteed and maintained for a period of 12 months from date of delivery? ☐ YES ☐ NO

YES NO

- If the answer above, is NO, state the item/s excluded and the period of guarantee applicable

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31.3.3. List the address of location in the Republic of South Africa where equipment maintenance will be performed:

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31.3.4. Give a short description of the back-up service that will be provided:

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BIDDER'S SIGNATURE:

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DATE:

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32. SENSOR FOR WATER LEVEL MEASUREMENT: PRESSURE TRANSDUCER: PIEZO RESISTIVE SENSOR (CERAMIC) WITH 4-20MA OUTPUT.

32.1. GENERAL INFORMATION:

32.1.1. Existence of manufacturing company:years **E**

32.1.2. Is Bidder an agency for equipment offered: ☐ YES ☐ NO **I**

32.1.3. Is Bidder an affiliated company to the manufacturing company: ☐ YES ☐ NO **I**

32.1.4. Is equipment offered, Hydrometry dedicated: ☐ YES ☐ NO **I**

32.1.5. Is equipment offered field proven: ☐ YES ☐ NO **I**

If the answer above, is YES, state the amount of years:.....years

32.1.6. Has manufacturing company been awarded an ISO 9001 certificate for quality assurance in:

Design/development, production, installation and servicing: ☐ YES ☐ NO

32.1.7. Any other Certification received? ☐ YES ☐ NO

If the answer above, is YES, Name the Certification:.....

32.1.8. Is original descriptive literature of the equipment offered, attached? ☐ YES ☐ NO

32.1.9. Are you aware of any impending modifications or development of new equipment on this item? ☐ YES ☐ NO

32.2. EQUIPMENT OFFERED:

32.2.1. Make:

32.2.2. Model:

32.2.3. Country of origin:.....

32.2.4. Can the sensor be interfaced with the data loggers, as specified in this Bid? ☐ YES ☐ NO

32.2.5. Should any other accessories be offered, please state the Make & Model: (Excluding Power Supplies & Enclosures – To be listed in Paragraph 6 and Paragraph 7.)

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32.3. CONTRACT PROGRAMME, MAINTENANCE, BACK-UP AND GUARANTEE:

32.3.1. Delivery period for equipment after placing the order:..... weeks

32.3.2. Will all equipment be guaranteed and maintained for a period of 12 months from date of delivery?

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| YES | NO |
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- If the answer above, is NO, state the item/s excluded and the period of guarantee applicable

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32.3.3. List the address of location in the Republic of South Africa where equipment maintenance will be performed:

32.3.4. Give a short description of the back-up service that will be provided:

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BIDDER'S SIGNATURE:

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DATE:

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33. SENSOR FOR WATER LEVEL MEASUREMENT: PRESSURE TRANSDUCER: PIEZO RESISTIVE SENSOR (STAINLESS STEEL) WITH SDI12 OUTPUT.

33.1. GENERAL INFORMATION:

33.1.1. Existence of manufacturing company:years **E**

33.1.2. Is Bidder an agency for equipment offered: ☐ YES ☐ NO

33.1.3. Is Bidder an affiliated company to the manufacturing company: ☐ YES ☐ NO

33.1.4. Is equipment offered, Hydrometry dedicated: ☐ YES ☐ NO

33.1.5. Is equipment offered field proven: ☐ YES ☐ NO

If the answer above, is YES, state the amount of years:.....years

33.1.6. Has manufacturing company been awarded an ISO 9001 certificate for quality assurance in:

Design/development, production, installation and servicing: ☐ YES ☐ NO

33.1.7. Any other Certification received? ☐ YES ☐ NO

If the answer above, is YES, Name the Certification:.....

33.1.8. Is original descriptive literature of the equipment offered, attached? ☐ YES ☐ NO

33.1.9. Are you aware of any impending modifications or development of new equipment on this item? ☐ YES ☐ NO

33.2. EQUIPMENT OFFERED:

33.2.1. Make:

33.2.2. Model:

33.2.3. Country of origin:.....

33.2.4. Can the sensor be interfaced with the data loggers, as specified in this Bid? ☐ YES ☐ NO

33.2.5. Should any other accessories be offered, please state the Make & Model:
(Excluding Power Supplies & Enclosures – To be listed in Paragraph 6 and Paragraph 7.)

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33.3. CONTRACT PROGRAMME, MAINTENANCE, BACK-UP AND GUARANTEE:

33.3.1. Delivery period for equipment after placing the order:..... weeks

33.3.2. Will all equipment be guaranteed and maintained for a period of 12 months from date of delivery?

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| YES | NO |
|-----|----|

- If the answer above, is NO, state the item/s excluded and the period of guarantee applicable

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33.3.3. List the address of location in the Republic of South Africa where equipment maintenance will be performed:

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33.3.4. Give a short description of the back-up service that will be provided:

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BIDDER'S SIGNATURE:

DATE:

34. SENSOR FOR WATER LEVEL MEASUREMENT: PRESSURE TRANSDUCER: PIEZO RESISTIVE SENSOR (CERAMIC) WITH SDI12 OUTPUT.

34.1. GENERAL INFORMATION:

34.1.1. Existence of manufacturing company:years **E**

34.1.2. Is Bidder an agency for equipment offered: ☐ YES ☐ NO

34.1.3. Is Bidder an affiliated company to the manufacturing company: ☐ YES ☐ NO

34.1.4. Is equipment offered, Hydrometry dedicated: ☐ YES ☐ NO

34.1.5. Is equipment offered field proven: ☐ YES ☐ NO

If the answer above, is YES, state the amount of years:.....years

34.1.6. Has manufacturing company been awarded an ISO 9001 certificate for quality assurance in:

Design/development, production, installation and servicing: ☐ YES ☐ NO

34.1.7. Any other Certification received? ☐ YES ☐ NO

If the answer above, is YES, Name the Certification:.....

34.1.8. Is original descriptive literature of the equipment offered, attached? ☐ YES ☐ NO

34.1.9. Are you aware of any impending modifications or development of new equipment on this item? ☐ YES ☐ NO

34.2. EQUIPMENT OFFERED:

34.2.1. Make:

34.2.2. Model:

34.2.3. Country of origin:.....

34.2.4. Can the sensor be interfaced with the data loggers, as specified in this Bid? ☐ YES ☐ NO

34.2.5. Should any other accessories be offered, please state the Make & Model:
(Excluding Power Supplies & Enclosures – To be listed in Paragraph 6 and Paragraph 7.)

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34.3. CONTRACT PROGRAMME, MAINTENANCE, BACK-UP AND GUARANTEE:

34.3.1. Delivery period for equipment after placing the order:..... weeks

34.3.2. Will all equipment be guaranteed and maintained for a period of 12 months from date of delivery?

☐ YES ☐ NO

- If the answer above, is NO, state the item/s excluded and the period of guarantee applicable

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34.3.3. List the address of location in the Republic of South Africa where equipment maintenance will be performed:

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34.3.4. Give a short description of the back-up service that will be provided:

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BIDDER'S SIGNATURE:

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DATE:

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35. SENSOR FOR WATER LEVEL MEASUREMENT: BUBBLER:

35.1. GENERAL INFORMATION:

35.1.1. Existence of manufacturing company:years E

35.1.2. Is Bidder an agency for equipment offered: ☐ YES ☐ NO

35.1.3. Is Bidder an affiliated company to the manufacturing company: ☐ YES ☐ NO

35.1.4. Is equipment offered, Hydrometry dedicated: ☐ YES ☐ NO

35.1.5. Is equipment offered field proven: ☐ YES ☐ NO

If the answer above, is YES, state the amount of years:.....years

35.1.6. Has manufacturing company been awarded an ISO 9001 certificate for quality assurance in:

Design/development, production, installation and servicing: ☐ YES ☐ NO

35.1.7. Any other Certification received? ☐ YES ☐ NO

If the answer above, is YES, Name the Certification:.....

35.1.8. Is original descriptive literature of the equipment offered, attached? ☐ YES ☐ NO

35.1.9. Are you aware of any impending modifications or development of new equipment on this item? ☐ YES ☐ NO

35.2. EQUIPMENT OFFERED:

35.2.1. Make:

35.2.2. Model:

35.2.3. Country of origin:.....

35.2.4. Can the sensor be interfaced with the data loggers, as specified in this Bid? ☐ YES ☐ NO

35.2.5. Should any other accessories be offered, please state the Make & Model:
(Excluding Power Supplies & Enclosures – To be listed in Paragraph 6 and Paragraph 7.)

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35.3. CONTRACT PROGRAMME, MAINTENANCE, BACK-UP AND GUARANTEE:

35.3.1. Delivery period for equipment after placing the order:..... weeks

35.3.2. Will all equipment be guaranteed and maintained for a period of 12 months from date of delivery?

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| YES | NO |
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- If the answer above, is NO, state the item/s excluded and the period of guarantee applicable

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35.3.3. List the address of location in the Republic of South Africa where equipment maintenance will be performed:

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35.3.4. Give a short description of the back-up service that will be provided:

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BIDDER'S SIGNATURE:

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DATE:

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36. SENSOR FOR WATER LEVEL MEASUREMENT: RADAR SENSOR WITH MEASURING RANGE: 8 METER.

36.1. GENERAL INFORMATION:

36.1.1. Existence of manufacturing company:years **E**

36.1.2. Is Bidder an agency for equipment offered: ☐ YES ☐ NO

36.1.3. Is Bidder an affiliated company to the manufacturing company: ☐ YES ☐ NO

36.1.4. Is equipment offered, Hydrometry dedicated: ☐ YES ☐ NO

36.1.5. Is equipment offered field proven: ☐ YES ☐ NO

If the answer above, is YES, state the amount of years:.....years

36.1.6. Has manufacturing company been awarded an ISO 9001 certificate for quality assurance in:

Design/development, production, installation and servicing: ☐ YES ☐ NO

36.1.7. Any other Certification received? ☐ YES ☐ NO

If the answer above, is YES, Name the Certification:.....

36.1.8. Is original descriptive literature of the equipment offered, attached? ☐ YES ☐ NO

36.1.9. Are you aware of any impending modifications or development of new equipment on this item? ☐ YES ☐ NO

36.2. EQUIPMENT OFFERED:

36.2.1. Make:

36.2.2. Model:

36.2.3. Country of origin:.....

36.2.4. Can the sensor be interfaced with the data loggers, as specified in this Bid? ☐ YES ☐ NO

36.2.5. Should any other accessories be offered, please state the Make & Model:
(Excluding Power Supplies & Enclosures – To be listed in Paragraph 6 and Paragraph 7.)

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36.3. CONTRACT PROGRAMME, MAINTENANCE, BACK-UP AND GUARANTEE:

36.3.1. Delivery period for equipment after placing the order:..... weeks

36.3.2. Will all equipment be guaranteed and maintained for a period of 12 months from date of delivery?

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|-----|----|
| YES | NO |
|-----|----|

- If the answer above, is NO, state the item/s excluded and the period of guarantee applicable

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36.3.3. List the address of location in the Republic of South Africa where equipment maintenance will be performed:

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36.3.4. Give a short description of the back-up service that will be provided:

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BIDDER'S SIGNATURE:

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DATE:

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37. SENSOR FOR WATER LEVEL MEASUREMENT: RADAR SENSOR WITH MEASURING RANGE: 15 METER.

37.1. GENERAL INFORMATION:

37.1.1. Existence of manufacturing company:years **E**

37.1.2. Is Bidder an agency for equipment offered: ☐ YES ☐ NO

37.1.3. Is Bidder an affiliated company to the manufacturing company: ☐ YES ☐ NO

37.1.4. Is equipment offered, Hydrometry dedicated: ☐ YES ☐ NO

37.1.5. Is equipment offered field proven: ☐ YES ☐ NO

If the answer above, is YES, state the amount of years:.....years

37.1.6. Has manufacturing company been awarded an ISO 9001 certificate for quality assurance in:

Design/development, production, installation and servicing: ☐ YES ☐ NO

37.1.7. Any other Certification received? ☐ YES ☐ NO

If the answer above, is YES, Name the Certification:.....

37.1.8. Is original descriptive literature of the equipment offered, attached? ☐ YES ☐ NO

37.1.9. Are you aware of any impending modifications or development of new equipment on this item? ☐ YES ☐ NO

37.2. EQUIPMENT OFFERED:

37.2.1. Make:

37.2.2. Model:

37.2.3. Country of origin:.....

37.2.4. Can the sensor be interfaced with the data loggers, as specified in this Bid? ☐ YES ☐ NO

37.2.5. Should any other accessories be offered, please state the Make & Model:
(Excluding Power Supplies & Enclosures – To be listed in Paragraph 6 and Paragraph 7.)

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37.3. CONTRACT PROGRAMME, MAINTENANCE, BACK-UP AND GUARANTEE:

37.3.1. Delivery period for equipment after placing the order:..... weeks

37.3.2. Will all equipment be guaranteed and maintained for a period of 12 months from date of delivery? YES NO

- If the answer above, is NO, state the item/s excluded and the period of guarantee applicable

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37.3.3. List the address of location in the Republic of South Africa where equipment maintenance will be performed:

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37.3.4. Give a short description of the back-up service that will be provided:

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BIDDER'S SIGNATURE:

DATE:

38. SENSOR FOR WATER LEVEL MEASUREMENT: RADAR SENSOR WITH MEASURING RANGE: 30 METER.

38.1. GENERAL INFORMATION:

38.1.1. Existence of manufacturing company:years **E**

38.1.2. Is Bidder an agency for equipment offered: ☐ YES ☐ NO

38.1.3. Is Bidder an affiliated company to the manufacturing company: ☐ YES ☐ NO

38.1.4. Is equipment offered, Hydrometry dedicated: ☐ YES ☐ NO

38.1.5. Is equipment offered field proven: ☐ YES ☐ NO

If the answer above, is YES, state the amount of years:.....years

38.1.6. Has manufacturing company been awarded an ISO 9001 certificate for quality assurance in:

Design/development, production, installation and servicing: ☐ YES ☐ NO

38.1.7. Any other Certification received? ☐ YES ☐ NO

If the answer above, is YES, Name the Certification:.....

38.1.8. Is original descriptive literature of the equipment offered, attached? ☐ YES ☐ NO

38.1.9. Are you aware of any impending modifications or development of new equipment on this item? ☐ YES ☐ NO

38.2. EQUIPMENT OFFERED:

38.2.1. Make:

38.2.2. Model:

38.2.3. Country of origin:.....

38.2.4. Can the sensor be interfaced with the data loggers, as specified in this Bid? ☐ YES ☐ NO

38.2.5. Should any other accessories be offered, please state the Make & Model:
(Excluding Power Supplies & Enclosures – To be listed in Paragraph 6 and Paragraph 7.)

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38.3. CONTRACT PROGRAMME, MAINTENANCE, BACK-UP AND GUARANTEE:

38.3.1. Delivery period for equipment after placing the order:..... weeks

38.3.2. Will all equipment be guaranteed and maintained for a period of 12 months from date of delivery?

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|-----|----|
| YES | NO |
|-----|----|

- If the answer above, is NO, state the item/s excluded and the period of guarantee applicable

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38.3.3. List the address of location in the Republic of South Africa where equipment maintenance will be performed:

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38.3.4. Give a short description of the back-up service that will be provided:

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BIDDER'S SIGNATURE:

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DATE:

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39. SENSOR FOR WATER LEVEL MEASUREMENT: CONTACT GAUGE.

39.1. GENERAL INFORMATION:

- 39.1.1. Existence of manufacturing company:years E
- 39.1.2. Is Bidder an agency for equipment offered: ☐ YES ☐ NO I
- 39.1.3. Is Bidder an affiliated company to the manufacturing company: ☐ YES ☐ NO I
- 39.1.4. Is equipment offered, Hydrometry dedicated: ☐ YES ☐ NO I
- 39.1.5. Is equipment offered field proven: ☐ YES ☐ NO I
- 39.1.6. If the answer above, is YES, state the amount of years:.....years I
- 39.1.7. Has manufacturing company been awarded an ISO 9001 certificate for quality assurance in: H
- Design/development, production, installation and servicing: ☐ YES ☐ NO
- 39.1.8. Any other Certification received? ☐ YES ☐ NO A
- 39.1.9. If the answer above, is YES, Name the Certification:..... I
- 39.1.10. Is original descriptive literature of the equipment offered, attached? ☐ YES ☐ NO
- 39.1.11. Are you aware of any impending modifications or development of new equipment on this item? ☐ YES ☐ NO

39.2. EQUIPMENT OFFERED:

- 39.2.1. Make: M
- 39.2.2. Model:
- 39.2.3. Country of origin:.....

39.2.4. Should any other accessories be offered, please state the Make & Model:
(Excluding Power Supplies & Enclosures – To be listed in Paragraph 6 and
Paragraph 7.)

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39.3. CONTRACT PROGRAMME, MAINTENANCE, BACK-UP AND GUARANTEE:

39.3.1. Delivery period for equipment after placing the order:..... weeks

39.3.2. Will all equipment be guaranteed and maintained for a period of 12 months from
date of delivery?

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|-----|----|
| YES | NO |
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- If the answer above, is NO, state the item/s excluded and the period of
guarantee applicable

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39.3.3. List the address of location in the Republic of South Africa where equipment
maintenance will be performed:

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39.3.4. Give a short description of the back-up service that will be provided:

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BIDDER'S SIGNATURE:

DATE:

40. SENSOR FOR WATER LEVEL MEASUREMENT: CONTACT GAUGE WITH TEMPERATURE.

40.1. GENERAL INFORMATION:

40.1.1. Existence of manufacturing company:years **E**

40.1.2. Is Bidder an agency for equipment offered: ☐ YES ☐ NO

40.1.3. Is Bidder an affiliated company to the manufacturing company: ☐ YES ☐ NO

40.1.4. Is equipment offered, Hydrometry dedicated: ☐ YES ☐ NO

40.1.5. Is equipment offered field proven: ☐ YES ☐ NO

If the answer above, is YES, state the amount of years:.....years

40.1.6. Has manufacturing company been awarded an ISO 9001 certificate for quality assurance in:

Design/development, production, installation and servicing: ☐ YES ☐ NO

40.1.7. Any other Certification received? ☐ YES ☐ NO

If the answer above, is YES, Name the Certification:.....

40.1.8. Is original descriptive literature of the equipment offered, attached? ☐ YES ☐ NO

40.1.9. Are you aware of any impending modifications or development of new equipment on this item? ☐ YES ☐ NO

40.2. EQUIPMENT OFFERED:

40.2.1. Make:

40.2.2. Model:

40.2.3. Country of origin:.....

40.2.4. Should any other accessories be offered, please state the Make & Model:
(Excluding Power Supplies & Enclosures – To be listed in Paragraph 6 and Paragraph 7.)

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40.3. CONTRACT PROGRAMME, MAINTENANCE, BACK-UP AND GUARANTEE:

40.3.1. Delivery period for equipment after placing the order:..... weeks

40.3.2. Will all equipment be guaranteed and maintained for a period of 12 months from date of delivery?

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|-----|----|
| YES | NO |
|-----|----|

- If the answer above, is NO, state the item/s excluded and the period of guarantee applicable

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40.3.3. List the address of location in the Republic of South Africa where equipment maintenance will be performed:

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40.3.4. Give a short description of the back-up service that will be provided:

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BIDDER'S SIGNATURE:

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DATE:

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41. SENSOR FOR WEATHER MEASUREMENT: RAIN GAUGE, TIPPING BUCKET WITH INTEGRATED SYPHON MECHANISM (HIGH LEVELS OF ACCURACY), POWDER COATED ALUMINIUM ONLY:

41.1. GENERAL INFORMATION:

41.1.1. Existence of manufacturing company:years E

41.1.2. Is Bidder an agency for equipment offered: ☐ YES ☐ NO

41.1.3. Is Bidder an affiliated company to the manufacturing company: ☐ YES ☐ NO

41.1.4. Is equipment offered, Hydrometry dedicated: ☐ YES ☐ NO

41.1.5. Is equipment offered field proven: ☐ YES ☐ NO

If the answer above, is YES, state the amount of years:.....years

41.1.6. Has manufacturing company been awarded an ISO 9001 certificate for quality assurance in:

Design/development, production, installation and servicing: ☐ YES ☐ NO

41.1.7. Any other Certification received? ☐ YES ☐ NO

If the answer above, is YES, Name the Certification:.....

41.1.8. Is original descriptive literature of the equipment offered, attached? ☐ YES ☐ NO

41.1.9. Are you aware of any impending modifications or development of new equipment on this item? ☐ YES ☐ NO

41.2. EQUIPMENT OFFERED:

41.2.1. Make:

41.2.2. Model:

41.2.3. Country of origin:.....

41.2.4. Can the sensor be interfaced with the data loggers, as specified in this Bid? ☐ YES ☐ NO

41.2.5. Should any other accessories be offered, please state the Make & Model:
(Excluding Power Supplies & Enclosures – To be listed in Paragraph 6 and Paragraph 7.)

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41.3. CONTRACT PROGRAMME, MAINTENANCE, BACK-UP AND GUARANTEE:

41.3.1. Delivery period for equipment after placing the order:..... weeks

41.3.2. Will all equipment be guaranteed and maintained for a period of 12 months from date of delivery?

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| YES | NO |
|-----|----|

- If the answer above, is NO, state the item/s excluded and the period of guarantee applicable

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41.3.3. List the address of location in the Republic of South Africa where equipment maintenance will be performed:

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41.3.4. Give a short description of the back-up service that will be provided:

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BIDDER'S SIGNATURE:

DATE:

42. SENSOR FOR WEATHER MEASUREMENT: RAIN GAUGE, TIPPING BUCKET WITH INTEGRATED SYPHON MECHANISM (HIGH LEVELS OF ACCURACY), POWDER COATED ALUMINIUM/ ASA POLYMER:

42.1. GENERAL INFORMATION:

42.1.1. Existence of manufacturing company:years E

42.1.2. Is Bidder an agency for equipment offered: ☐ YES ☐ NO

42.1.3. Is Bidder an affiliated company to the manufacturing company: ☐ YES ☐ NO

42.1.4. Is equipment offered, Hydrometry dedicated: ☐ YES ☐ NO

42.1.5. Is equipment offered field proven: ☐ YES ☐ NO

If the answer above, is YES, state the amount of years:.....years

42.1.6. Has manufacturing company been awarded an ISO 9001 certificate for quality assurance in:

Design/development, production, installation and servicing: ☐ YES ☐ NO

42.1.7. Any other Certification received? ☐ YES ☐ NO

If the answer above, is YES, Name the Certification:.....

42.1.8. Is original descriptive literature of the equipment offered, attached? ☐ YES ☐ NO

42.1.9. Are you aware of any impending modifications or development of new equipment on this item? ☐ YES ☐ NO

42.2. EQUIPMENT OFFERED:

42.2.1. Make:

42.2.2. Model:

42.2.3. Country of origin:.....

42.2.4. Can the sensor be interfaced with the data loggers, as specified in this Bid? ☐ YES ☐ NO

42.2.5. Should any other accessories be offered, please state the Make & Model:
(Excluding Power Supplies & Enclosures – To be listed in Paragraph 6 and Paragraph 7.)

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42.3. CONTRACT PROGRAMME, MAINTENANCE, BACK-UP AND GUARANTEE:

42.3.1. Delivery period for equipment after placing the order:..... weeks

42.3.2. Will all equipment be guaranteed and maintained for a period of 12 months from date of delivery?

| | |
|-----|----|
| YES | NO |
|-----|----|

- If the answer above, is NO, state the item/s excluded and the period of guarantee applicable

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42.3.3. List the address of location in the Republic of South Africa where equipment maintenance will be performed:

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42.3.4. Give a short description of the back-up service that will be provided:

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BIDDER'S SIGNATURE:

DATE:

43. SENSOR FOR WEATHER MEASUREMENT: RAIN GAUGE, TIPPING BUCKET WITH INTEGRATED SYPHON MECHANISM (HIGH LEVELS OF ACCURACY), FOR LOW RAINFALL EVENTS, POWDER COATED ALUMINIUM/ ASA POLYMER:

43.1. GENERAL INFORMATION:

43.1.1. Existence of manufacturing company:years E

43.1.2. Is Bidder an agency for equipment offered: ☐ YES ☐ NO

43.1.3. Is Bidder an affiliated company to the manufacturing company: ☐ YES ☐ NO

43.1.4. Is equipment offered, Hydrometry dedicated: ☐ YES ☐ NO

43.1.5. Is equipment offered field proven: ☐ YES ☐ NO

If the answer above, is YES, state the amount of years:.....years

43.1.6. Has manufacturing company been awarded an ISO 9001 certificate for quality assurance in:

Design/development, production, installation and servicing: ☐ YES ☐ NO

43.1.7. Any other Certification received? ☐ YES ☐ NO

If the answer above, is YES, Name the Certification:.....

43.1.8. Is original descriptive literature of the equipment offered, attached? ☐ YES ☐ NO

43.1.9. Are you aware of any impending modifications or development of new equipment on this item? ☐ YES ☐ NO

43.2. EQUIPMENT OFFERED:

43.2.1. Make:

43.2.2. Model:

43.2.3. Country of origin:.....

43.2.4. Can the sensor be interfaced with the data loggers, as specified in this Bid? ☐ YES ☐ NO

43.2.5. Should any other accessories be offered, please state the Make & Model:
(Excluding Power Supplies & Enclosures – To be listed in Paragraph 6 and Paragraph 7.)

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43.3. CONTRACT PROGRAMME, MAINTENANCE, BACK-UP AND GUARANTEE:

43.3.1. Delivery period for equipment after placing the order:..... weeks

43.3.2. Will all equipment be guaranteed and maintained for a period of 12 months from date of delivery?

| | |
|-----|----|
| YES | NO |
|-----|----|

- If the answer above, is NO, state the item/s excluded and the period of guarantee applicable

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43.3.3. List the address of location in the Republic of South Africa where equipment maintenance will be performed:

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43.3.4. Give a short description of the back-up service that will be provided:

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BIDDER'S SIGNATURE:

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DATE:

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44. SENSOR FOR WEATHER MEASUREMENT: RAIN GAUGE, TIPPING BUCKET WITH INTEGRATED SYPHON MECHANISM (HIGH LEVELS OF ACCURACY), ASA POLYMER:

44.1. GENERAL INFORMATION:

44.1.1. Existence of manufacturing company:years E

44.1.2. Is Bidder an agency for equipment offered: ☐ YES ☐ NO

44.1.3. Is Bidder an affiliated company to the manufacturing company: ☐ YES ☐ NO

44.1.4. Is equipment offered, Hydrometry dedicated: ☐ YES ☐ NO

44.1.5. Is equipment offered field proven: ☐ YES ☐ NO

If the answer above, is YES, state the amount of years:.....years

44.1.6. Has manufacturing company been awarded an ISO 9001 certificate for quality assurance in:

Design/development, production, installation and servicing: ☐ YES ☐ NO

44.1.7. Any other Certification received? ☐ YES ☐ NO

If the answer above, is YES, Name the Certification:.....

44.1.8. Is original descriptive literature of the equipment offered, attached? ☐ YES ☐ NO

44.1.9. Are you aware of any impending modifications or development of new equipment on this item? ☐ YES ☐ NO

44.2. EQUIPMENT OFFERED:

44.2.1. Make:

44.2.2. Model:

44.2.3. Country of origin:.....

44.2.4. Can the sensor be interfaced with the data loggers, as specified in this Bid? ☐ YES ☐ NO

44.2.5. Should any other accessories be offered, please state the Make & Model:
(Excluding Power Supplies & Enclosures – To be listed in Paragraph 6 and Paragraph 7.)

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44.3. CONTRACT PROGRAMME, MAINTENANCE, BACK-UP AND GUARANTEE:

44.3.1. Delivery period for equipment after placing the order:..... weeks

44.3.2. Will all equipment be guaranteed and maintained for a period of 12 months from date of delivery?

| | |
|-----|----|
| YES | NO |
|-----|----|

- If the answer above, is NO, state the item/s excluded and the period of guarantee applicable

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44.3.3. List the address of location in the Republic of South Africa where equipment maintenance will be performed:

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44.3.4. Give a short description of the back-up service that will be provided:

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BIDDER'S SIGNATURE:

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DATE:

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45. SENSOR FOR WEATHER MEASUREMENT: BAROMETRIC PRESSURE:

45.1. GENERAL INFORMATION:

45.1.1. Existence of manufacturing company:years E

45.1.2. Is Bidder an agency for equipment offered: ☐ YES ☐ NO

45.1.3. Is Bidder an affiliated company to the manufacturing company: ☐ YES ☐ NO

45.1.4. Is equipment offered, Hydrometry dedicated: ☐ YES ☐ NO

45.1.5. Is equipment offered field proven: ☐ YES ☐ NO

If the answer above, is YES, state the amount of years:.....years

45.1.6. Has manufacturing company been awarded an ISO 9001 certificate for quality assurance in:

Design/development, production, installation and servicing: ☐ YES ☐ NO

45.1.7. Any other Certification received? ☐ YES ☐ NO

If the answer above, is YES, Name the Certification:.....

45.1.8. Is original descriptive literature of the equipment offered, attached? ☐ YES ☐ NO

45.1.9. Are you aware of any impending modifications or development of new equipment on this item? ☐ YES ☐ NO

45.2. EQUIPMENT OFFERED:

45.2.1. Make:

45.2.2. Model:

45.2.3. Country of origin:.....

45.2.4. Can the sensor be interfaced with the data loggers, as specified in this ☐ YES ☐ NO

45.2.5. Should any other accessories be offered, please state the Make & Model:
(Excluding Power Supplies & Enclosures – To be listed in Paragraph 6 and Paragraph 7.)

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45.3. CONTRACT PROGRAMME, MAINTENANCE, BACK-UP AND GUARANTEE:

45.3.1. Delivery period for equipment after placing the order:..... weeks

45.3.2. Will all equipment be guaranteed and maintained for a period of 12 months from date of delivery?

☐ YES ☐ NO

- If the answer above, is NO, state the item/s excluded and the period of guarantee applicable

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45.3.3. List the address of location in the Republic of South Africa where equipment maintenance will be performed:

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45.3.4. Give a short description of the back-up service that will be provided:

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BIDDER'S SIGNATURE:

DATE:

46. SENSOR FOR WEATHER MEASUREMENT: HUMIDITY AND AIR TEMPERATURE

46.1. GENERAL INFORMATION:

46.1.1. Existence of manufacturing company:years E

46.1.2. Is Bidder an agency for equipment offered: ☐ YES ☐ NO

46.1.3. Is Bidder an affiliated company to the manufacturing company: ☐ YES ☐ NO

46.1.4. Is equipment offered, Hydrometry dedicated: ☐ YES ☐ NO

46.1.5. Is equipment offered field proven: ☐ YES ☐ NO

If the answer above, is YES, state the amount of years:.....years

46.1.6. Has manufacturing company been awarded an ISO 9001 certificate for quality assurance in:

Design/development, production, installation and servicing: ☐ YES ☐ NO

46.1.7. Any other Certification received? ☐ YES ☐ NO

If the answer above, is YES, Name the Certification:.....

46.1.8. Is original descriptive literature of the equipment offered, attached? ☐ YES ☐ NO

46.1.9. Are you aware of any impending modifications or development of new equipment on this item? ☐ YES ☐ NO

46.2. EQUIPMENT OFFERED:

46.2.1. Make:

46.2.2. Model:

46.2.3. Country of origin:.....

46.2.4. Can the sensor be interfaced with the data loggers, as specified in this Bid? ☐ YES ☐ NO

46.2.5. Should any other accessories be offered, please state the Make & Model:
(Excluding Power Supplies & Enclosures – To be listed in Paragraph 6 and Paragraph 7.)

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46.3. CONTRACT PROGRAMME, MAINTENANCE, BACK-UP AND GUARANTEE:

46.3.1. Delivery period for equipment after placing the order:..... weeks

46.3.2. Will all equipment be guaranteed and maintained for a period of 12 months from date of delivery?

☐ YES ☐ NO

- If the answer above, is NO, state the item/s excluded and the period of guarantee applicable

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46.3.3. List the address of location in the Republic of South Africa where equipment maintenance will be performed:

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46.3.4. Give a short description of the back-up service that will be provided:

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BIDDER'S SIGNATURE:

DATE:

47. SENSOR FOR WEATHER MEASUREMENT: WIND DIRECTION INDICATOR

47.1. GENERAL INFORMATION:

47.1.1. Existence of manufacturing company:years E

47.1.2. Is Bidder an agency for equipment offered: ☐ YES ☐ NO

47.1.3. Is Bidder an affiliated company to the manufacturing company: ☐ YES ☐ NO

47.1.4. Is equipment offered, Hydrometry dedicated: ☐ YES ☐ NO

47.1.5. Is equipment offered field proven: ☐ YES ☐ NO

If the answer above, is YES, state the amount of years:.....years

47.1.6. Has manufacturing company been awarded an ISO 9001 certificate for quality assurance in:

Design/development, production, installation and servicing: ☐ YES ☐ NO

47.1.7. Any other Certification received? ☐ YES ☐ NO

If the answer above, is YES, Name the Certification:.....

47.1.8. Is original descriptive literature of the equipment offered, attached? ☐ YES ☐ NO

47.1.9. Are you aware of any impending modifications or development of new equipment on this item? ☐ YES ☐ NO

47.2. EQUIPMENT OFFERED:

47.2.1. Make:

47.2.2. Model:

47.2.3. Country of origin:.....

47.2.4. Can the sensor be interfaced with the data loggers, as specified in this Bid? ☐ YES ☐ NO

47.2.5. Should any other accessories be offered, please state the Make & Model:
(Excluding Power Supplies & Enclosures – To be listed in Paragraph 6 and Paragraph 7.)

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47.3. CONTRACT PROGRAMME, MAINTENANCE, BACK-UP AND GUARANTEE:

47.3.1. Delivery period for equipment after placing the order:..... weeks

47.3.2. Will all equipment be guaranteed and maintained for a period of 12 months from date of delivery? YES NO

- If the answer above, is NO, state the item/s excluded and the period of guarantee applicable

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47.3.3. List the address of location in the Republic of South Africa where equipment maintenance will be performed:

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47.3.4. Give a short description of the back-up service that will be provided:

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BIDDER'S SIGNATURE:

DATE:

48. SENSOR FOR WEATHER MEASUREMENT: NET RADIATION

48.1. GENERAL INFORMATION:

48.1.1. Existence of manufacturing company:years E

48.1.2. Is Bidder an agency for equipment offered: ☐ YES ☐ NO

48.1.3. Is Bidder an affiliated company to the manufacturing company: ☐ YES ☐ NO

48.1.4. Is equipment offered, Hydrometry dedicated: ☐ YES ☐ NO

48.1.5. Is equipment offered field proven: ☐ YES ☐ NO

If the answer above, is YES, state the amount of years:.....years

48.1.6. Has manufacturing company been awarded an ISO 9001 certificate for quality assurance in:

Design/development, production, installation and servicing: ☐ YES ☐ NO

48.1.7. Any other Certification received? ☐ YES ☐ NO

If the answer above, is YES, Name the Certification:.....

48.1.8. Is original descriptive literature of the equipment offered, attached? ☐ YES ☐ NO

48.1.9. Are you aware of any impending modifications or development of new equipment on this item? ☐ YES ☐ NO

48.2. EQUIPMENT OFFERED:

48.2.1. Make:

48.2.2. Model:

48.2.3. Country of origin:.....

48.2.4. Can the sensor be interfaced with the data loggers, as specified in this Bid? ☐ YES ☐ NO

48.2.5. Should any other accessories be offered, please state the Make & Model:
(Excluding Power Supplies & Enclosures – To be listed in Paragraph 6 and Paragraph 7.)

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48.3. CONTRACT PROGRAMME, MAINTENANCE, BACK-UP AND GUARANTEE:

48.3.1. Delivery period for equipment after placing the order:..... weeks

48.3.2. Will all equipment be guaranteed and maintained for a period of 12 months from date of delivery?

☐ YES ☐ NO

- If the answer above, is NO, state the item/s excluded and the period of guarantee applicable

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48.3.3. List the address of location in the Republic of South Africa where equipment maintenance will be performed:

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48.3.4. Give a short description of the back-up service that will be provided:

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BIDDER'S SIGNATURE:

DATE:

TECHNICAL SCHEDULES FOR POWER SUPPLY EQUIPMENT

49. BATTERY, SEALED, RECHARGEABLE, VALVE REGULATED LEAD-ACID SOLAR TYPE, 12 VOLT, 120 AH CAPACITY:

49.1. GENERAL INFORMATION:

49.1.1. Existence of manufacturing company:years ^E

49.1.2. Is Bidder an agency for equipment offered: ☐ YES ☐ NO

49.1.3. Is Bidder an affiliated company to the manufacturing company: ☐ YES ☐ NO

49.1.4. Is original descriptive literature of the equipment offered, attached? ☐ YES ☐ NO

49.2. EQUIPMENT OFFERED:

49.2.1. Make:

49.2.2. Model:

49.2.3. Country of origin:.....

49.2.4. Description of sealed, rechargeable, valve regulated lead-acid solar type battery:

- Voltage: V;
- Capacity: Ah;
- Weight:kg;
- Dimensions: Height:mm;
Width:mm;
Length:mm;

49.3. CONTRACT PROGRAMME, MAINTENANCE, BACK-UP AND GUARANTEE:

49.3.1. Delivery period for equipment after placing the order:..... weeks

49.3.2. Will all equipment be guaranteed and maintained for a period of 12 months from date of delivery? YES NO

- If the answer above, is NO, state the item/s excluded and the period of guarantee applicable

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BIDDER'S SIGNATURE:

DATE:

50. BATTERY, SEALED, RECHARGEABLE, VALVE REGULATED LEAD-ACID SOLAR TYPE, 12 VOLT, 105 AH CAPACITY:

50.1. GENERAL INFORMATION:

50.1.1. Existence of manufacturing company:years **E**

50.1.2. Is Bidder an agency for equipment offered: ☐ YES ☐ NO

50.1.3. Is Bidder an affiliated company to the manufacturing company: ☐ YES ☐ NO

50.1.4. Is original descriptive literature of the equipment offered, attached? ☐ YES ☐ NO

50.2. EQUIPMENT OFFERED:

50.2.1. Make:

50.2.2. Model:

50.2.3. Country of origin:.....

50.2.4. Description of sealed, rechargeable, valve regulated lead-acid solar type battery:

- Voltage: V;
- Capacity: Ah;
- Weight:kg;
- Dimensions: Height:mm;
Width:mm;
Length:mm;

50.3. CONTRACT PROGRAMME, MAINTENANCE, BACK-UP AND GUARANTEE:

50.3.1. Delivery period for equipment after placing the order:..... weeks

50.3.2. Will all equipment be guaranteed and maintained for a period of 12 months from date of delivery? ☐ YES ☐ NO

- If the answer above, is NO, state the item/s excluded and the period of guarantee applicable

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BIDDER'S SIGNATURE:

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DATE:

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51. BATTERY, SEALED, RECHARGEABLE, LEAD-ACID SOLAR TYPE, 12 VOLT, 40 AH CAPACITY:

51.1. GENERAL INFORMATION:

51.1.1. Existence of manufacturing company:years ^E

51.1.2. Is Bidder an agency for equipment offered: ☐ YES ☐ NO

51.1.3. Is Bidder an affiliated company to the manufacturing company: ☐ YES ☐ NO

51.1.4. Is original descriptive literature of the equipment offered, attached? ☐ YES ☐ NO

51.2. EQUIPMENT OFFERED:

51.2.1. Make:

51.2.2. Model:

51.2.3. Country of origin:.....

51.2.4. Description of sealed, rechargeable, lead-acid solar type battery:

- Voltage: V;
- Capacity: Ah;
- Weight:kg;
- Dimensions: Height:mm;
Width:mm;
Length:mm;

51.3. CONTRACT PROGRAMME, MAINTENANCE, BACK-UP AND GUARANTEE:

51.3.1. Delivery period for equipment after placing the order:..... weeks

51.3.2. Will all equipment be guaranteed and maintained for a period of 12 months from date of delivery? ☐ YES ☐ NO

- If the answer above, is NO, state the item/s excluded and the period of guarantee applicable

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BIDDER'S SIGNATURE:

DATE:

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52. BATTERY, SEALED, RECHARGEABLE, LEAD-ACID SOLAR TYPE, 12 VOLT, 28 AH CAPACITY:

52.1. GENERAL INFORMATION:

52.1.1. Existence of manufacturing company:years E

52.1.2. Is Bidder an agency for equipment offered: ☐ YES ☐ NO

52.1.3. Is Bidder an affiliated company to the manufacturing company: ☐ YES ☐ NO

52.1.4. Is original descriptive literature of the equipment offered, attached? ☐ YES ☐ NO

52.2. EQUIPMENT OFFERED:

52.2.1. Make:

52.2.2. Model:

52.2.3. Country of origin:

52.2.4. Description of sealed, rechargeable, lead-acid solar type battery:

- Voltage: V;
- Capacity: Ah;
- Weight:kg;
- Dimensions: Height:mm;
Width:mm;
Length:mm;

52.3. CONTRACT PROGRAMME, MAINTENANCE, BACK-UP AND GUARANTEE:

52.3.1. Delivery period for equipment after placing the order:..... weeks

52.3.2. Will all equipment be guaranteed and maintained for a period of 12 months from date of delivery? ☐ YES ☐ NO

- If the answer above, is NO, state the item/s excluded and the period of guarantee applicable

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BIDDER'S SIGNATURE:

DATE:

53. BATTERY, SEALED, RECHARGEABLE, LEAD-ACID SOLAR TYPE, 12 VOLT, 12 AH CAPACITY:

53.1. GENERAL INFORMATION:

53.1.1. Existence of manufacturing company:years E

53.1.2. Is Bidder an agency for equipment offered: ☐ YES ☐ NO

53.1.3. Is Bidder an affiliated company to the manufacturing company: ☐ YES ☐ NO

53.1.4. Is original descriptive literature of the equipment offered, attached? ☐ YES ☐ NO

53.2. EQUIPMENT OFFERED:

53.2.1. Make:

53.2.2. Model:

53.2.3. Country of origin:

53.2.4. Description of sealed, rechargeable, lead-acid battery:

- Voltage: V;
- Capacity: Ah;
- Weight:kg;
- Dimensions: Height:mm;
Width:mm;
Length:mm;

53.3. CONTRACT PROGRAMME, MAINTENANCE, BACK-UP AND GUARANTEE:

53.3.1. Delivery period for equipment after placing the order:..... weeks

53.3.2. Will all equipment be guaranteed and maintained for a period of 12 months from date of delivery? ☐ YES ☐ NO

- If the answer above, is NO, state the item/s excluded and the period of guarantee applicable

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BIDDER'S SIGNATURE:

DATE:

54. BATTERY, SEALED, RECHARGEABLE, LEAD-CRYSTAL SOLAR TYPE, 12 VOLT, 28 AH CAPACITY:

54.1. GENERAL INFORMATION:

54.1.1. Existence of manufacturing company:years E

54.1.2. Is Bidder an agency for equipment offered: ☐ YES ☐ NO

54.1.3. Is Bidder an affiliated company to the manufacturing company: ☐ YES ☐ NO

54.1.4. Is original descriptive literature of the equipment offered, attached? ☐ YES ☐ NO

54.2. EQUIPMENT OFFERED:

54.2.1. Make:

54.2.2. Model:

54.2.3. Country of origin:

54.2.4. Description of sealed, rechargeable, lead-acid battery:

- Voltage: V;
- Capacity: Ah;
- Weight:kg;
- Dimensions: Height:mm;
Width:mm;
Length:mm;

54.3. CONTRACT PROGRAMME, MAINTENANCE, BACK-UP AND GUARANTEE:

54.3.1. Delivery period for equipment after placing the order:..... weeks

54.3.2. Will all equipment be guaranteed and maintained for a period of 12 months from date of delivery? ☐ YES ☐ NO

- If the answer above, is NO, state the item/s excluded and the period of guarantee applicable

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BIDDER'S SIGNATURE:

DATE:

55. BATTERY, SIZE D, LITHIUM-THIONYL CHLORIDE TYPE, 3.6 VOLT, 13 AH CAPACITY:

55.1. GENERAL INFORMATION:

55.1.1. Existence of manufacturing company:years **E**

55.1.2. Is Bidder an agency for equipment offered: ☐ YES ☐ NO

55.1.3. Is Bidder an affiliated company to the manufacturing company: ☐ YES ☐ NO

55.1.4. Is original descriptive literature of the equipment offered, attached? ☐ YES ☐ NO

55.2. EQUIPMENT OFFERED:

55.2.1. Make:

55.2.2. Model:

55.2.3. Country of origin:

55.2.4. Description of size D, Lithium-Thionyl Chloride type battery:

- Voltage: V;
- Capacity: Ah;
- Container material:

55.3. CONTRACT PROGRAMME, MAINTENANCE, BACK-UP AND GUARANTEE:

55.3.1. Delivery period for equipment after placing the order: weeks

55.3.2. Will all equipment be guaranteed and maintained for a period of 12 months from date of delivery? ☐ YES ☐ NO

- If the answer above, is NO, state the item/s excluded and the period of guarantee applicable

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BIDDER'S SIGNATURE:

DATE:

56. BATTERY, SIZE D, LITHIUM-THIONYL CHLORIDE TYPE, 3.6 VOLT, 13 AH CAPACITY WITH PCB CONNECTOR,

56.1. GENERAL INFORMATION:

56.1.1. Existence of manufacturing company:years **E**

56.1.2. Is Bidder an agency for equipment offered: ☐ YES ☐ NO

56.1.3. Is Bidder an affiliated company to the manufacturing company: ☐ YES ☐ NO

56.1.4. Is original descriptive literature of the equipment offered, attached? ☐ YES ☐ NO

56.2. EQUIPMENT OFFERED:

56.2.1. Make:

56.2.2. Model:

56.2.3. Country of origin:.....

56.2.4. Description of size D, Lithium-Thionyl Chloride type battery:

- Voltage: V;
- Capacity: Ah;
- Container material:
- Connector type:
- Lead wire length:mm

56.3. CONTRACT PROGRAMME, MAINTENANCE, BACK-UP AND GUARANTEE:

56.3.1. Delivery period for equipment after placing the order:..... weeks

56.3.2. Will all equipment be guaranteed and maintained for a period of 12 months from date of delivery? ☐ YES ☐ NO

- If the answer above, is NO, state the item/s excluded and the period of guarantee applicable

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BIDDER'S SIGNATURE:

DATE:

57. BATTERY, SIZE D, LITHIUM-THIONYL CHLORIDE TYPE, 3.6 VOLT, 13 AH CAPACITY WITH ELP-02V CONNECTOR:

57.1. GENERAL INFORMATION:

57.1.1. Existence of manufacturing company:years **E**

57.1.2. Is Bidder an agency for equipment offered: ☐ YES ☐ NO

57.1.3. Is Bidder an affiliated company to the manufacturing company: ☐ YES ☐ NO

57.1.4. Is original descriptive literature of the equipment offered, attached? ☐ YES ☐ NO

57.2. EQUIPMENT OFFERED:

57.2.1. Make:

57.2.2. Model:

57.2.3. Country of origin:.....

57.2.4. Description of size D, Lithium-Thionyl Chloride type battery:

- Voltage: V;
- Capacity: Ah;
- Container material:
- Connector type:
- Lead wire length:mm

57.3. CONTRACT PROGRAMME, MAINTENANCE, BACK-UP AND GUARANTEE:

57.3.1. Delivery period for equipment after placing the order:..... weeks

57.3.2. Will all equipment be guaranteed and maintained for a period of 12 months from date of delivery? ☐ YES ☐ NO

- If the answer above, is NO, state the item/s excluded and the period of guarantee applicable

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BIDDER'S SIGNATURE:

DATE:

58. BATTERY, SIZE D, LITHIUM-THIONYL CHLORIDE TYPE, 3.6 VOLT, 26 AH CAPACITY WITH ELP-02V CONNECTOR:

58.1. GENERAL INFORMATION:

58.1.1. Existence of manufacturing company:years E

58.1.2. Is Bidder an agency for equipment offered: ☐ YES ☐ NO

58.1.3. Is Bidder an affiliated company to the manufacturing company: ☐ YES ☐ NO

58.1.4. Is original descriptive literature of the equipment offered, attached? ☐ YES ☐ NO

58.2. EQUIPMENT OFFERED:

58.2.1. Make:

58.2.2. Model:

58.2.3. Country of origin:

58.2.4. Description of size D, Lithium-Thionyl Chloride type battery:

- Voltage: V;
- Capacity: Ah;
- Container material:
- Connector type:
- Lead wire length:mm

58.3. CONTRACT PROGRAMME, MAINTENANCE, BACK-UP AND GUARANTEE:

58.3.1. Delivery period for equipment after placing the order:..... weeks

58.3.2. Will all equipment be guaranteed and maintained for a period of 12 months from date of delivery? ☐ YES ☐ NO

- If the answer above, is NO, state the item/s excluded and the period of guarantee applicable

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BIDDER'S SIGNATURE:

DATE:

59. BATTERY, SIZE AA, LITHIUM-THIONYL CHLORIDE TYPE, 3.6 VOLT, 2.6 AH CAPACITY

59.1. GENERAL INFORMATION:

59.1.1. Existence of manufacturing company:years **E**

59.1.2. Is Bidder an agency for equipment offered: ☐ YES ☐ NO

59.1.3. Is Bidder an affiliated company to the manufacturing company: ☐ YES ☐ NO

59.1.4. Is original descriptive literature of the equipment offered, attached? ☐ YES ☐ NO

59.2. EQUIPMENT OFFERED:

59.2.1. Make:

59.2.2. Model:

59.2.3. Country of origin:.....

59.2.4. Description of size AA, Lithium-Thionyl Chloride type battery:

- Voltage: V;
- Capacity: Ah;
- Container material:

59.3. CONTRACT PROGRAMME, MAINTENANCE, BACK-UP AND GUARANTEE:

59.3.1. Delivery period for equipment after placing the order:..... weeks

59.3.2. Will all equipment be guaranteed and maintained for a period of 12 months from date of delivery? ☐ YES ☐ NO

- If the answer above, is NO, state the item/s excluded and the period of guarantee applicable

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BIDDER'S SIGNATURE:

DATE:

60. BATTERY, SIZE D, TWO CELL, LITHIUM-THIONYL CHLORIDE TYPE, 3.9 VOLT, 38 AH CAPACITY WITH ATX CONNECTOR,

60.1. GENERAL INFORMATION:

60.1.1. Existence of manufacturing company:years **E**

60.1.2. Is Bidder an agency for equipment offered: ☐ YES ☐ NO

60.1.3. Is Bidder an affiliated company to the manufacturing company: ☐ YES ☐ NO

60.1.4. Is original descriptive literature of the equipment offered, attached? ☐ YES ☐ NO

60.2. EQUIPMENT OFFERED:

60.2.1. Make:

60.2.2. Model:

60.2.3. Country of origin:

60.2.4. Description of size D, Two cell, Lithium-Thionyl Chloride type battery:

- Voltage: V;
- Capacity: Ah;
- Container material:
- Connector type:
- Lead wire length:mm

60.3. CONTRACT PROGRAMME, MAINTENANCE, BACK-UP AND GUARANTEE:

60.3.1. Delivery period for equipment after placing the order:..... weeks

60.3.2. Will all equipment be guaranteed and maintained for a period of 12 months from date of delivery? ☐ YES ☐ NO

- If the answer above, is NO, state the item/s excluded and the period of guarantee applicable

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BIDDER'S SIGNATURE:

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DATE:

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61. BATTERY, SIZE A, TADIRAN LITHIUM TYPE, 3.9 VOLT, 1.55 AH CAPACITY WITH TAGGED HYBRID LAYER CAPACITOR POLARISED PINS,

61.1. GENERAL INFORMATION:

61.1.1. Existence of manufacturing company:years **E**

61.1.2. Is Bidder an agency for equipment offered: ☐ YES ☐ NO

61.1.3. Is Bidder an affiliated company to the manufacturing company: ☐ YES ☐ NO

61.1.4. Is original descriptive literature of the equipment offered, attached? ☐ YES ☐ NO

61.2. EQUIPMENT OFFERED:

61.2.1. Make:

61.2.2. Model:

61.2.3. Country of origin:.....

61.2.4. Description of size A, Tadiran Lithium type battery:

- Voltage: V;
- Capacity: Ah;
- Container material:
- Connector type:

61.3. CONTRACT PROGRAMME, MAINTENANCE, BACK-UP AND GUARANTEE:

61.3.1. Delivery period for equipment after placing the order:..... weeks

61.3.2. Will all equipment be guaranteed and maintained for a period of 12 months from date of delivery? ☐ YES ☐ NO

- If the answer above, is NO, state the item/s excluded and the period of guarantee applicable

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BIDDER'S SIGNATURE:

DATE:

62. BATTERY, SIZE C, ALKALINE TYPE, 1.5 VOLT,

62.1. GENERAL INFORMATION:

62.1.1. Existence of manufacturing company:years

62.1.2. Is Bidder an agency for equipment offered: ☐ YES ☐ NO

62.1.3. Is Bidder an affiliated company to the manufacturing company: ☐ YES ☐ NO

62.1.4. Is original descriptive literature of the equipment offered, attached? ☐ YES ☐ NO

62.2. EQUIPMENT OFFERED:

62.2.1. Make:

62.2.2. Model:

62.2.3. Country of origin:.....

62.2.4. Description of size C, Alkaline type battery:

- Voltage: V;
- Capacity: Ah;

62.3. CONTRACT PROGRAMME, MAINTENANCE, BACK-UP AND GUARANTEE:

62.3.1. Delivery period for equipment after placing the order:..... weeks

62.3.2. Will all equipment be guaranteed and maintained for a period of 12 months from date of delivery? ☐ YES ☐ NO

- If the answer above, is NO, state the item/s excluded and the period of guarantee applicable

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BIDDER'S SIGNATURE:

DATE:

63. BATTERY, SIZE AA, ALKALINE TYPE, 1.5 VOLT,

63.1. GENERAL INFORMATION:

63.1.1. Existence of manufacturing company:years ^E

63.1.2. Is Bidder an agency for equipment offered: ☐ YES ☐ NO

63.1.3. Is Bidder an affiliated company to the manufacturing company: ☐ YES ☐ NO

63.1.4. Is original descriptive literature of the equipment offered, attached? ☐ YES ☐ NO

63.2. EQUIPMENT OFFERED:

63.2.1. Make:

63.2.2. Model:

63.2.3. Country of origin:.....

63.2.4. Description of size AA, Alkaline type battery:

- Voltage: V;
- Capacity: Ah;

63.3. CONTRACT PROGRAMME, MAINTENANCE, BACK-UP AND GUARANTEE:

63.3.1. Delivery period for equipment after placing the order:..... weeks

63.3.2. Will all equipment be guaranteed and maintained for a period of 12 months from date of delivery? ☐ YES ☐ NO

- If the answer above, is NO, state the item/s excluded and the period of guarantee applicable

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BIDDER'S SIGNATURE:

DATE:

64. BATTERY, SIZE AAA, ALKALINE TYPE, 1.5 VOLT,

64.1. GENERAL INFORMATION:

64.1.1. Existence of manufacturing company:years ^E

64.1.2. Is Bidder an agency for equipment offered: ☐ YES ☐ NO

64.1.3. Is Bidder an affiliated company to the manufacturing company: ☐ YES ☐ NO

64.1.4. Is original descriptive literature of the equipment offered, attached? ☐ YES ☐ NO

64.2. EQUIPMENT OFFERED:

64.2.1. Make:

64.2.2. Model:

64.2.3. Country of origin:

64.2.4. Description of size AAA, Alkaline type battery:

- Voltage: V;
- Capacity: Ah;

64.3. CONTRACT PROGRAMME, MAINTENANCE, BACK-UP AND GUARANTEE:

64.3.1. Delivery period for equipment after placing the order: weeks

64.3.2. Will all equipment be guaranteed and maintained for a period of 12 months from date of delivery? ☐ YES ☐ NO

- If the answer above, is NO, state the item/s excluded and the period of guarantee applicable

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BIDDER'S SIGNATURE:

DATE:

65. SOLAR PANELS, 12 VOLT, CRYSTALLINE:

65.1. GENERAL INFORMATION:

65.1.1. Existence of manufacturing company:years E

65.1.2. Is Bidder an agency for equipment offered: ☐ YES ☐ NO

65.1.3. Is Bidder an affiliated company to the manufacturing company: ☐ YES ☐ NO

65.1.4. Is original descriptive literature of the equipment offered, attached? ☐ YES ☐ NO

65.2. EQUIPMENT OFFERED:

65.2.1. Make:

65.2.2. Model:

65.2.3. Country of origin:.....

65.2.4. Description of solar panels offered:

| ELECTRICAL & PHYSICAL CHARACTERISTICS | SOLAR PANEL 1 | SOLAR PANEL 2 | SOLAR PANEL 3 | SOLAR PANEL 4 | SOLAR PANEL 5 | SOLAR PANEL 6 |
|---------------------------------------|---------------|---------------|---------------|---------------|---------------|---------------|
| Voltage (V) | | | | | | |
| Power (Watts) | | | | | | |
| Length (mm) | | | | | | |
| Width (mm) | | | | | | |
| Depth (mm) | | | | | | |
| Weight (kg) | | | | | | |

65.3. CONTRACT PROGRAMME, MAINTENANCE, BACK-UP AND GUARANTEE:

65.3.1. Delivery period for equipment after placing the order:..... weeks

65.3.2. Will all equipment be guaranteed and maintained for a period of 12 months from date of delivery? ☐ YES ☐ NO

- If the answer above, is NO, state the item/s excluded and the period of guarantee applicable

BIDDER'S SIGNATURE:

DATE:

66. SOLAR CHARGE CONTROLLERS:

66.1. GENERAL INFORMATION:

66.1.1.

Existence of manufacturing company:years

66.1.2. Is Bidder an agency for equipment offered:

☐ YES ☐ NO

66.1.3. Is Bidder an affiliated company to the manufacturing company:

☐ YES ☐ NO

66.1.4. Is original descriptive literature of the equipment offered, attached?

☐ YES ☐ NO

66.2. EQUIPMENT OFFERED:

66.2.1. Make:

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66.2.2. Model:

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66.2.3. Country of origin:

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66.2.4. Description of solar charge controllers offered:

| TECHNICAL CHARACTERISTICS | CONTROLLE R 1 | CONTROLLE R 2 | CONTROLLE R 3 |
|---|------------------|------------------|------------------|
| Nominal Voltage (Volt) | | | |
| Module Current (Amp) | | | |
| Load Current (Amp) | | | |
| Own Consumption (mAmp) | | | |
| Length (mm) | | | |
| Width (mm) | | | |
| Depth (mm) | | | |
| Connection Terminal size (mm ²) | | | |

66.3. CONTRACT PROGRAMME, MAINTENANCE, BACK-UP AND GUARANTEE:

66.3.1. Delivery period for equipment after placing the order:..... weeks

66.3.2. Will all equipment be guaranteed and maintained for a period of 12 months from date of delivery?

☐ YES ☐ NO

- If the answer above, is NO, state the item/s excluded and the period of guarantee applicable

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BIDDER'S SIGNATURE:

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DATE:

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67. POWER CONTROL UNIT OR MAINS TRANSFORMER:

67.1. GENERAL INFORMATION:

67.1.1. Existence of manufacturing company:years E

67.1.2. Is Bidder an agency for equipment offered: ☐ YES ☐ NO

67.1.3. Is Bidder an affiliated company to the manufacturing company: ☐ YES ☐ NO

67.1.4. Is original descriptive literature of the equipment offered, attached? ☐ YES ☐ NO

67.2. EQUIPMENT OFFERED:

67.2.1. Make:

67.2.2. Model:

67.2.3. Country of origin:.....

67.2.4. Description of Power Control Unit or Mains Transformer (Technical Details):

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67.3. CONTRACT PROGRAMME, MAINTENANCE, BACK-UP AND GUARANTEE:

67.3.1. Delivery period for equipment after placing the order:..... weeks

67.3.2. Will all equipment be guaranteed and maintained for a period of 12 months from date of delivery? ☐ YES ☐ NO

- If the answer above, is NO, state the item/s excluded and the period of guarantee applicable

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BIDDER'S SIGNATURE:
DATE:

68. BATTERY CHARGER, 12 VOLT, AUTOMATIC, 8 STAGE, INTELLIGENT:

68.1. GENERAL INFORMATION:

68.1.1. Existence of manufacturing company:years E

68.1.2. Is Bidder an agency for equipment offered: ☐ YES ☐ NO

68.1.3. Is Bidder an affiliated company to the manufacturing company: ☐ YES ☐ NO

68.1.4. Is original descriptive literature of the equipment offered, attached? ☐ YES ☐ NO

68.2. EQUIPMENT OFFERED:

68.2.1. Make:

68.2.2. Model:

68.2.3. Country of origin:.....

68.2.4. Description of Battery Charger, 12 Volt, Automatic:

| TECHNICAL CHARACTERISTICS | CHARGER | |
|---------------------------------|---------|----|
| Portable? | YES | NO |
| Automatic diagnostic function? | YES | NO |
| Charge cable length (m) | | |
| Length (mm) | | |
| Width (mm) | | |
| Depth (mm) | | |
| Weight (g) | | |
| Voltage: Output (Volt) | | |
| Voltage: Input Rated AC (Volt) | | |
| Voltage: Minimum battery (Volt) | | |
| Current: charging (Amp) | | |
| Current: mains (Amp) | | |
| Current: drain (Ah / month) | | |
| Current: ripple (%) | | |
| Temperature range (°C) | | |
| Suitable battery types: | | |
| Battery charging capacity (Ah) | | |
| Insulation class: | | |

TECHNICAL SCHEDULES FOR HANDHELD ACOUSTIC DOPPLER CURRENT METERS

69. HANDHELD ACOUSTIC DOPPLER INSTRUMENT 1:

69.1. GENERAL INFORMATION:

69.1.1. Existence of manufacturing company:years

69.1.2. Is Bidder an agency for equipment offered: ☐ YES ☐ NO

69.1.3. Is Bidder an affiliated company to the manufacturing company: ☐ YES ☐ NO

69.1.4. Is equipment offered, Hydrometry dedicated: ☐ YES ☐ NO

69.1.5. Is equipment offered field proven: ☐ YES ☐ NO

If the answer above, is YES, state the amount of years:years

69.1.6. Has manufacturing company been awarded an ISO 9001 certificate for quality assurance in:

Design/development, production, installation and servicing: ☐ YES ☐ NO

69.1.7. Any other Certification received? ☐ YES ☐ NO

If the answer above, is YES, Name the Certification:

69.1.8. Is original descriptive literature of the equipment offered, attached? ☐ YES ☐ NO

69.2. EQUIPMENT OFFERED:

69.2.1. Make:

69.2.2. Model:

69.2.3. Country of origin:.....

69.2.4. Description of Current meter / Sensor / Probe:

- Instrument body material:
- Minimum water depth:
- Velocity measurement range (m/s):
- Velocity measurement resolution (m/s).
- Velocity measurement accuracy (%):
- Probe width (mm):
- Probe weight (kg):
- Operational temperature range (°C):

- Cable included?
- RS 232/USB converter included?

69.2.5. Description of hand-held interface / counter unit:

- Instrument body material:
- Display type:
- Interface keypad type:
- Memory size:
- Power supply:
- Memory type:
- Software package included:
- Automatic Discharge Computation?
- Discharge measurement output format:

69.2.6. Accessories:

- Data transfer cable?
- Tools:
- Robust carry case?
- Non-corrosive rod (cm graduations)?
- Other:
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69.3. CONTRACT PROGRAMME, MAINTENANCE, BACK-UP AND GUARANTEE:

69.3.1. Delivery period for equipment after placing the order: weeks

69.3.2. Delivery period: Firm or Not. YES NO

69.3.3. Will all equipment be guaranteed and maintained for a period of 12 months from date of delivery? YES NO

- If the answer above, is NO, state the item/s excluded and the period of guarantee applicable

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69.3.4. L
ist the address of location in the Republic of South Africa where equipment
maintenance will be performed:

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69.3.5. G
ive a short description of the back-up service that will be provided:

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69.4. TRAINING:

69.4.1. G
ive a description of the technical training that will be provided

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BIDDER'S SIGNATURE:

NAME OF BIDDER / COMPANY:

DATE:

70. HANDHELD ACOUSTIC DOPPLER INSTRUMENT 2:

70.1. GENERAL INFORMATION:

70.1.1. Existence of manufacturing company:years E

70.1.2. Is Bidder an agency for equipment offered: ☐ YES ☐ NO I

70.1.3. Is Bidder an affiliated company to the manufacturing company: ☐ YES ☐ NO I

70.1.4. Is equipment offered, Hydrometry dedicated: ☐ YES ☐ NO I

70.1.5. Is equipment offered field proven: ☐ YES ☐ NO I

If the answer above, is YES, state the amount of years:.....years

70.1.6. Has manufacturing company been awarded an ISO 9001 certificate for quality assurance in: H

Design/development, production, installation and servicing: ☐ YES ☐ NO

70.1.7. Any other Certification received? ☐ YES ☐ NO A

If the answer above, is YES, Name the Certification:.....

70.1.8. Is original descriptive literature of the equipment offered, attached? ☐ YES ☐ NO

70.2. EQUIPMENT OFFERED:

70.2.1. Make: M

70.2.2. Model: M

70.2.3. Country of origin: C

70.2.4. Description of Current meter / Sensor / Probe: D

- Supportable on 20 mm rod?
- Instrument body material:

- Minimum water depth:
- Velocity measurement range (m/s):
- Velocity measurement resolution (m/s).
- Velocity measurement accuracy (%):
- Probe width (mm):
- Probe weight (kg):
- Operational temperature range (°C):
- Cable included?
- RS 232/USB converter included?

70.2.5.

D

escription of hand-held interface / counter unit:

- Instrument body material:
- Display type:
- Interface keypad type:
- Memory size:
- Power supply:
- Memory type:
- Software package included (name):
- Automatic Discharge Computation?
- Discharge measurement output format:

70.2.6.

A

ccessories:

- Data transfer cable?
- Tools:
- Robust carry case?
- Non-corrosive rod (cm graduations)?
- Other:

70.3. CONTRACT PROGRAMME, MAINTENANCE, BACK-UP AND GUARANTEE:

70.3.1.

D

elivery period for equipment after placing the order: weeks

☐ YES ☐ NO

70.3.2. D
elivery period: Firm or Not.

70.3.3. W
ill all equipment be guaranteed and maintained for a period of 12 months from YES NO
date of delivery?

- If the answer above, is NO, state the item/s excluded and the period of guarantee applicable

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70.3.4. L
ist the address of location in the Republic of South Africa where equipment maintenance will be performed:

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70.3.5. G
ive a short description of the back-up service that will be provided:

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70.4. TRAINING:

70.4.1.

ive a description of the technical training that will be provided

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BIDDER'S SIGNATURE:

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NAME OF BIDDER / COMPANY:

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DATE:

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TECHNICAL SCHEDULES FOR ACOUSTIC DOPPLER CURRENT PROFILING SYSTEMS

71. ACOUSTIC DOPPLER CURRENT PROFILER 1;

71.1. GENERAL INFORMATION:

71.1.1. Existence of manufacturing company:years E

71.1.2. Is Bidder an agency for equipment offered: ☐ YES ☐ NO I

71.1.3. Is Bidder an affiliated company to the manufacturing company: ☐ YES ☐ NO I

71.1.4. Is equipment offered, Hydrometry dedicated: ☐ YES ☐ NO I

71.1.5. Is equipment offered field proven: ☐ YES ☐ NO I

If the answer above, is YES, state the amount of years:.....years

71.1.6. Has manufacturing company been awarded an ISO 9001 certificate for quality assurance in: H

Design/development, production, installation and servicing: ☐ YES ☐ NO

71.1.7. Any other Certification received? ☐ YES ☐ NO A

If the answer above, is YES, Name the Certification:.....

71.1.8. Is original descriptive literature of the equipment offered, attached? ☐ YES ☐ NO

71.2. EQUIPMENT OFFERED:

71.2.1. Make: M

71.2.2. Model: M

71.2.3. Country of origin: C

71.2.4. Description of carrying vessel: D

- Body material:
- Hull type:
- Maximum water speed (m/s):
- Length (mm):
- Width (mm):
- Weight (kg):
- Built-in watertight compartment for power supply?
.....
- Built-in watertight compartment for communication system supply?
.....

71.2.5. D
Description of Acoustic Doppler Current Profiler:

- Body material:
- Minimum water depth (m):
- Maximum water depth (m):
- Number of transducers:
- Transducer frequency MHz:
- Velocity measurement range (m/s):
- Velocity measurement accuracy (%):
- Depth cell size (cm):
- Blanking distance (cm):
- Operational temperature range (°C):
- Temperature measurement range (°C):
- Temperature measurement accuracy (°C):
- Internal memory capacity (MB):

71.2.6. D
Description of Power Supply:

- Battery type:
- Battery operational lifetime (hours):
- Power switch location:

71.2.7. D
Description of Communication:

- Radio type:
- Internal power supply?
- Antenna location:

71.2.8. D
ata receiver:

- Body material:
- Display type:
- Interface keypad type:
- Automatic Discharge Computation?
- Battery type:
- Battery operational lifetime (hours):
- Memory size:
- Memory type:
- Discharge measurement output format:

71.2.9. A
pplication Software:

- Software package included (name):

71.3. CONTRACT PROGRAMME, MAINTENANCE, BACK-UP AND GUARANTEE:

71.3.1. D
elivery period for equipment after placing the order:..... weeks

71.3.2. ☐ YES ☒ NO
elivery period: Firm or Not.

71.3.3. W
ill all equipment be guaranteed and maintained for a period of 12 months from ☒ YES ☐ NO
date of delivery?

- If the answer above, is NO, state the item/s excluded and the period of guarantee applicable

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71.3.4.

L

ist the address of location in the Republic of South Africa where equipment maintenance will be performed:

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71.3.5.

G

ive a short description of the back-up service that will be provided:

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71.4. TRAINING:

71.4.1.

G

ive a description of the technical training that will be provided

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BIDDER'S SIGNATURE:

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NAME OF BIDDER / COMPANY:

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DATE:

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72. ACOUSTIC DOPPLER CURRENT PROFILER 2;

72.1. GENERAL INFORMATION:

72.1.1. Existence of manufacturing company:years E

72.1.2. Is Bidder an agency for equipment offered: ☐ YES ☐ NO I

72.1.3. Is Bidder an affiliated company to the manufacturing company: ☐ YES ☐ NO I

72.1.4. Is equipment offered, Hydrometry dedicated: ☐ YES ☐ NO I

72.1.5. Is equipment offered field proven: ☐ YES ☐ NO I

If the answer above, is YES, state the amount of years:.....years

72.1.6. Has manufacturing company been awarded an ISO 9001 certificate for quality assurance in: H

Design/development, production, installation and servicing: ☐ YES ☐ NO

72.1.7. Any other Certification received? ☐ YES ☐ NO A

If the answer above, is YES, Name the Certification:.....

72.1.8. Is original descriptive literature of the equipment offered, attached? ☐ YES ☐ NO I

72.2. EQUIPMENT OFFERED:

72.2.1. Make: M

72.2.2. Model: M

72.2.3. Country of origin: C

72.2.4. Description of carrying vessel: D

- Body material:

- Hull type:
- Maximum water speed (m/s):
- Length (mm):
- Width (mm):
- Weight (kg):
- Built-in watertight compartment for power supply?
.....
- Built-in watertight compartment for communication system supply?
.....

72.2.5. D
 Description of Acoustic Doppler Current Profiler:

- Body material:
- Minimum water depth (m):
- Maximum water depth (m):
- Number of transducers:
- Transducer frequency MHz:
- Data validity assessment feature (name):
- Velocity measurement range (m/s):
- Velocity measurement accuracy (%):
- Depth cell size (cm):
- Blanking distance (cm):
- Operational temperature range (°C):
- Temperature measurement range (°C):
- Temperature measurement accuracy (°C):

72.2.6. D
 Description of Power Supply:

- Battery type:
- Battery operational lifetime (hours):
- Power switch location:

72.2.7. D
 Description of Communication:

- Radio type:
- Internal power supply?
- Antenna location:

72.2.8. D
 Data receiver:

- Body material:
- Display type:
- Interface keypad type:
- Automatic Discharge Computation?
- Battery type:
- Battery operational lifetime (hours):
- Memory size:
- Memory type:
- Discharge measurement output format:

72.2.9. A
Application Software:

- Software package included (name):

72.3. CONTRACT PROGRAMME, MAINTENANCE, BACK-UP AND GUARANTEE:

72.3.1. D
Delivery period for equipment after placing the order: weeks

72.3.2. ☐ YES ☐ NO D
Delivery period: Firm or Not.

72.3.3. W
Will all equipment be guaranteed and maintained for a period of 12 months from date of delivery? ☐ YES ☐ NO

- If the answer above, is NO, state the item/s excluded and the period of guarantee applicable

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72.3.4. L
List the address of location in the Republic of South Africa where equipment maintenance will be performed:

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72.3.5.

G

ive a short description of the back-up service that will be provided:

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72.4. TRAINING:

72.4.1.

G

ive a description of the technical training that will be provided

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BIDDER'S SIGNATURE:

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NAME OF BIDDER / COMPANY:

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DATE:

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73. ACOUSTIC DOPPLER CURRENT PROFILER 3.

73.1. GENERAL INFORMATION:

73.1.1. Existence of manufacturing company:years E

73.1.2. Is Bidder an agency for equipment offered: ☐ YES ☐ NO I

73.1.3. Is Bidder an affiliated company to the manufacturing company: ☐ YES ☐ NO I

73.1.4. Is equipment offered, Hydrometry dedicated: ☐ YES ☐ NO I

73.1.5. Is equipment offered field proven: ☐ YES ☐ NO I

If the answer above, is YES, state the amount of years:.....years

73.1.6. Has manufacturing company been awarded an ISO 9001 certificate for quality assurance in: H

Design/development, production, installation and servicing: ☐ YES ☐ NO

73.1.7. Any other Certification received? ☐ YES ☐ NO A

If the answer above, is YES, Name the Certification:.....

73.1.8. Is original descriptive literature of the equipment offered, attached? ☐ YES ☐ NO

73.2. EQUIPMENT OFFERED:

73.2.1. Make: M

73.2.2. Model: M

73.2.3. Country of origin: C

73.2.4. Description of carrying vessel: D

- Body material:
- Hull type:

- Maximum water speed (m/s):
- Length (mm):
- Width (mm):
- Weight (kg):
- Built-in watertight compartment for power supply?
.....
- Built-in watertight compartment for communication system supply?
.....
- Optional upgrade of carrying vessel?

73.2.5.

D

Description of Acoustic Doppler Current Profiler:

- Body material:
- "Bottom-Tracking" included?
- Minimum water depth (m):
- Maximum water depth (m):
- Depth measurement accuracy (%):
- Data validity assessment feature (name):
- Number of transducers:
- Transducer frequency MHz:
- Data validity assessment feature (name):
- Velocity measurement range (m/s):
- Velocity measurement accuracy (%):
- Depth cell size (cm):
- Compass / tilt sensor resolution (°):
- Compass / tilt sensor precision (°):
- Compass / tilt sensor pitch accuracy (°):
- Compass / tilt sensor heading accuracy (°):
- Operational water temperature range (°C):
- Operational air temperature range (°C):
- Temperature measurement range (°C):
- Temperature measurement accuracy (°C):
- Optional upgrade of Acoustic Doppler Current Profiler?
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73.2.6.

D

Description of Power Supply:

- Battery type:
- Battery operational lifetime (hours):
- Power switch location:

- Reverse polarity protection?
- Optional upgrade of power module?

73.2.7.

D

Description of Communication -, Cable- and Connector:

- Radio type:
- Communication baud rate range (baud):
- Removable connection cable type:
- Removable connection cable length (m)
- Removable connection cable connector type:
- Optional upgrade of communications module?

73.2.8.

U

User interface / software:

- Software operating system:
- Software screen update speed:
- Software capable to update profiler firmware?
- Software capable to configure profiler?
- Software capable to review discharge measurement information?
- Software capable to perform diagnostic tests?
- Software capable to perform real-time calculations?
- Software capable to calculate bottom-, top-, left- and right discharges from accepted hydraulic sound methods?
- Software capable to display the progress of ongoing measurements and monitor the status and quality of data being collected?
- Software capable to compile and store an original record of the data acquired and calculated for each discharge measurement in the form of a summary?
- Software capable to compile and store an original record of the data acquired and calculated for each discharge measurement in binary format?

73.2.9. A

Application Software:

- Software package included (name):
- Software capable to select depth cell size, number of depth cells and averaging time for each profile?
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73.2.10. G

Global Positioning System:

- GPS interface type:
- GPS string/s accepted:
- GPS differential corrections included:
- GPS update interval (seconds):
- GPS registration fee included?

73.2.11. A

Accessories:

- Data transfer cable:
- Tools:
- Robust carry case:
- Corrosion free bracket:
- Remotely operated cableway vehicle:
- Alternative carrying vessel:
- Remote controlled carrying vessel:
- Software to eliminate discharge errors:
- Spares:

73.3. CONTRACT PROGRAMME, MAINTENANCE, BACK-UP AND GUARANTEE:

73.3.1. D
Delivery period for equipment after placing the order:..... weeks

73.3.2. ☐ YES ☒ NO
Delivery period: Firm or Not.

73.3.3. W
Will all equipment be guaranteed and maintained for a period of 12 months from date of delivery? ☐ YES ☒ NO

- If the answer above, is NO, state the item/s excluded and the period of guarantee applicable

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73.3.4. L

List the address of location in the Republic of South Africa where equipment maintenance will be performed:

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73.3.5. G

Give a short description of the back-up service that will be provided:

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73.4. TRAINING:

73.4.1. G

Give a description of the technical training that will be provided

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BIDDER'S SIGNATURE:

NAME OF BIDDER / COMPANY:

DATE:

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74. ACOUSTIC DOPPLER CURRENT PROFILER 4.

74.1. GENERAL INFORMATION:

74.1.1. Existence of manufacturing company:years E

74.1.2. Is Bidder an agency for equipment offered: ☐ YES ☐ NO I

74.1.3. Is Bidder an affiliated company to the manufacturing company: ☐ YES ☐ NO I

74.1.4. Is equipment offered, Hydrometry dedicated: ☐ YES ☐ NO I

74.1.5. Is equipment offered field proven: ☐ YES ☐ NO I

If the answer above, is YES, state the amount of years:.....years

74.1.6. Has manufacturing company been awarded an ISO 9001 certificate for quality assurance in: H

Design/development, production, installation and servicing: ☐ YES ☐ NO

74.1.7. Any other Certification received? ☐ YES ☐ NO A

If the answer above, is YES, Name the Certification:.....

74.1.8. Is original descriptive literature of the equipment offered, attached? ☐ YES ☐ NO

74.2. EQUIPMENT OFFERED:

74.2.1. Make: M

74.2.2. Model: M

74.2.3. Country of origin: C

74.2.4. Description of carrying vessel: D

- Body material:
- Hull type:

- Maximum water speed (m/s):
- Length (mm):
- Width (mm):
- Weight (kg):
- Built-in watertight compartment for power supply?
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- Built-in watertight compartment for communication system supply?
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- Optional upgrade of carrying vessel?

74.2.5.

D

escription of Acoustic Doppler Current Profiler:

- Body material:
- “Bottom-Tracking” included?
- Minimum water depth (m):
- Maximum water depth (m):
- Depth measurement accuracy (%):
- Data validity assessment feature (name):
- Number of transducers:
- Transducer frequency MHz:
- Data validity assessment feature (name):
- Velocity measurement range (m/s):
- Velocity measurement accuracy (%):
- Depth cell size (cm):
- Compass / tilt sensor resolution (°):
- Compass / tilt sensor precision (°):
- Compass / tilt sensor pitch accuracy (°):
- Compass / tilt sensor heading accuracy (°):
- Operational water temperature range (°C):
- Operational air temperature range (°C):
- Temperature measurement range (°C):
- Temperature measurement accuracy (°C):
- Optional upgrade of Acoustic Doppler Current Profiler?
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74.2.6.

D

escription of Power Supply:

- Battery type:
- Battery operational lifetime (hours):
- Power switch location:

- Reverse polarity protection?
- Optional upgrade of power module?

74.2.7.

D

Description of Communication -, Cable- and Connector:

- Radio type:
- Communication baud rate range (baud):
- Removable connection cable type:
- Removable connection cable length (m)
- Removable connection cable connector type:
- Optional upgrade of communications module?

74.2.8.

U

User interface / software:

- Software operating system:
- Software screen update speed:
- Software capable to update profiler firmware?
- Software capable to configure profiler?
- Software capable to review discharge measurement information?
- Software capable to perform diagnostic tests?
- Software capable to perform real-time calculations?
- Software capable to calculate bottom-, top-, left- and right discharges from accepted hydraulic sound methods?
- Software capable to display the progress of ongoing measurements and monitor the status and quality of data being collected?
- Software capable to compile and store an original record of the data acquired and calculated for each discharge measurement in the form of a summary?
- Software capable to compile and store an original record of the data acquired and calculated for each discharge measurement in binary format?

74.2.9. A
Application Software:

- Software package included (name):
- Software capable to select depth cell size, number of depth cells and averaging time for each profile?
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74.2.10. G
Global Positioning System:

- GPS interface type:
- GPS string/s accepted:
- GPS differential corrections included:
- GPS update interval (seconds):
- GPS registration fee included?

74.2.11. A
Accessories:

- Data transfer cable:
- Tools:
- Robust carry case:
- Corrosion free bracket:
- Remotely operated cableway vehicle:
- Alternative carrying vessel:
- Remote controlled carrying vessel:
- Software to eliminate discharge errors:
- Spares:

74.3. CONTRACT PROGRAMME, MAINTENANCE, BACK-UP AND GUARANTEE:

74.3.1. D
Delivery period for equipment after placing the order: weeks

74.3.2. ☐ YES ☒ NO
Delivery period: Firm or Not.

74.3.3. W
Will all equipment be guaranteed and maintained for a period of 12 months from date of delivery? ☒ YES ☐ NO

- If the answer above, is NO, state the item/s excluded and the period of guarantee applicable

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74.3.4. L
 ist the address of location in the Republic of South Africa where equipment maintenance will be performed:

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74.3.5. G
 ive a short description of the back-up service that will be provided:

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74.4. TRAINING:

74.4.1. G
 ive a description of the technical training that will be provided

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BIDDER'S SIGNATURE:

NAME OF BIDDER / COMPANY:

DATE:

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TECHNICAL SCHEDULES FOR VANDAL RESISTANT EQUIPMENT HOUSING;

75. VANDAL RESISTANT EQUIPMENT HOUSING;

75.1. GENERAL INFORMATION:

75.1.1. Existence of manufacturing company:years E

75.1.2. Is Bidder an agency for equipment offered: ☐ YES ☐ NO I

75.1.3. Is Bidder an affiliated company to the manufacturing company: ☐ YES ☐ NO I

75.1.4. Is equipment offered field proven: ☐ YES ☐ NO I

If the answer above, is YES, state the amount of years:.....years

75.1.5. Has manufacturing company been awarded an ISO 9001 certificate for quality assurance in: H

Design/development, production, installation and servicing: ☐ YES ☐ NO

75.1.6. Any other Certification received? ☐ YES ☐ NO A

If the answer above, is YES, Name the Certification:.....

75.1.7. Is original descriptive literature of the equipment offered, attached? ☐ YES ☐ NO

75.2. EQUIPMENT OFFERED:

75.2.1. Make: M

75.2.2. Country of origin: C

75.2.3. Description of Custom size vandal resistant equipment hut door and frame with anti-tamper / anti-vandalism locking device: D

- Name/ Description:
.....
- Manufactured from:

- Dimensions (mm):
- Weight (kg):
- Type of locking mechanism:
-
-
-
-

75.2.4.

D

escription of Anti-Tamper / Anti-Vandalism equipment enclosures / cabinets in various sizes and with various mounting options:

b) Enclosure 1 (small, approximately 40L volume):

- Name/ Description:
-
- Manufactured from:
- Dimensions (mm):
- Weight (kg):
- Type of locking mechanism:
-
-
-
-
- Accessories:
-
-
-
-

c) Enclosure 2 (medium, approximately 80L volume):

- Name/ Description:
-
- Manufactured from:
- Dimensions (mm):
- Weight (kg):
- Type of locking mechanism:
-
-
-
-
- Accessories:
-
-
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-

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d) Enclosure 3 (large, approximately 100L volume):

- Name/ Description:

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- Manufactured from:
- Dimensions (mm):
- Weight (kg):
- Type of locking mechanism:

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- Accessories:

.....

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.....

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75.2.5.

D

Description of Man-Hole cover door with Anti-Tamper / Anti-Vandalism locking device.

- Name/ Description:

.....

- Manufactured from:
- Dimensions (mm):
- Weight (kg):
- Type of locking mechanism:

.....

.....

.....

.....

75.2.6.

D

Description of Gauge Box - Protection device for sensors with anti-tamper locking device:

- Name/ Description:

.....

- Manufactured from:
- Minimum size (mm):
- Various lengths available?
- Two inlets for trunking?

- Water pipe connection from bottom rear?
- Hydrostatic resistance to continuous cast of 2.5 m wet concrete?
- Type of locking mechanism:
- Accessories:

75.2.7.

D

escription of Draw Box - Adjustable piping connector with multiple adjustable inlets and anti-tamper locking device.

- Name/ Description:
- Manufactured from:
- Dimensions (mm):
- Weight (kg):
- Number of inlets for trunking:
- Possible to seal inlets?
- Type of locking mechanism:
- Accessories:

75.3. CONTRACT PROGRAMME, MAINTENANCE, BACK-UP AND GUARANTEE:

75.3.1.

D

elivery period for equipment after placing the order: weeks

75.3.2.

YES NO D

elivery period: Firm or Not.

75.3.3.

W

ill all equipment be guaranteed and maintained for a period of 12 months from date of delivery? YES NO

- If the answer above, is NO, state the item/s excluded and the period of guarantee applicable

.....

.....

.....

.....

BIDDER'S SIGNATURE:

NAME OF BIDDER / COMPANY:

DATE:

SECTION 6: PRICE SCHEDULES

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- 2.1. SINGLE CHANNEL DATA LOGGER:
- 2.2. MULTI-CHANNEL DATA LOGGER;

3. INTEGRATED DATA LOGGER WITH INTEGRATED SENSORS

- 3.1. SINGLE CHANNEL DATA LOGGER WITH INTEGRATED SENSOR: SHAFT ENCODER;
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- 3.9. MULTI-CHANNEL DATA LOGGER WITH INTEGRATED SENSORS: PRESSURE TRANSDUCER (NON-VENTED), TEMPERATURE- AND CONDUCTIVITY SENSOR.
- 3.10. MULTI-CHANNEL DATA LOGGER WITH INTEGRATED SENSORS: PRESSURE TRANSDUCER (NON-VENTED), TEMPERATURE- AND CONDUCTIVITY SENSOR; WITH BAROMETRIC PRESSURE COMPENSATOR:

- 3.11. MULTI-CHANNEL DATA LOGGER WITH INTEGRATED PRESSURE, TEMPERATURE AND CONDUCTIVITY SENSORS – FOR UNATTENDED DEPLOYMENT WITH NO CABLES ATTACHED:
- 3.12. MULTI-CHANNEL DATA LOGGER WITH INTEGRATED PRESSURE, TEMPERATURE AND CONDUCTIVITY SENSORS, WITH PRACTICAL SALINITY SCALE OUTPUT – FOR UNATTENDED DEPLOYMENT WITH NO CABLES ATTACHED:
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- 3.15. MULTI-CHANNEL DATA LOGGER WITH INTEGRATED SENSORS: PRESSURE TRANSDUCER, TEMPERATURE- AND CONDUCTIVITY SENSOR, WITH BUILT-IN GPS AND BLUETOOTH COMMUNICATION:
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- 3.19. MULTI-CHANNEL DATA LOGGER WITH INTEGRATED SENSORS: PRESSURE TRANSDUCER AND WATER VELOCITY MEASUREMENT FOR USE IN SHALLOW STREAMS;
- 3.20. MULTI-CHANNEL DATA LOGGER WITH INTEGRATED SENSORS: WEATHER PARAMETERS;
- 3.21. MULTI-CHANNEL DATA LOGGER FOR EXTERNAL SENSORS: 4-20 MA (VENTED PRESSURE TRANSDUCER) AND DIGITAL PULSE (RAINFALL); SUBMERSIBLE WITH INTERNAL BATTERY AND INTERNAL GSM MODEM;
- 3.22. MULTI-CHANNEL DATA LOGGER FOR EXTERNAL SENSORS: MULTIPLE; WITH DATA TRANSMISSION CAPABILITIES.

4. INTEGRATED DATA LOGGER WITH REMOVABLE WATER QUALITY SENSORS

- 4.1. MULTI-PARAMETER WATER QUALITY SONDE WITH PH-, ELECTRICAL CONDUCTIVITY-, TEMPERATURE-, DEPTH AND OPTICAL OXYGEN SENSORS (BLUETOOTH COMMUNICATION CAPABILITY) – DIAMETER LESS THAN FIVE CENTIMETRES;
- 4.2. DEEP WATER (MINIMUM 245M) MULTI-PARAMETER WATER QUALITY SONDE WITH OPTICAL AND SMART SENSOR TECHNOLOGY - DIAMETER LESS THAN FIVE CENTIMETRES;
- 4.3. DEEP WATER (MINIMUM 245M) MULTI-PARAMETER WATER QUALITY SONDE WITH OPTICAL AND SMART SENSOR TECHNOLOGY - DIAMETER LESS THAN NINE CENTIMETRES;

5. HANDHELD WATER QUALITY DEVICES

- 5.1. MULTI-PARAMETER HANDHELD WATER QUALITY SYSTEM (WITH PH-, DISSOLVED OXYGEN-, ELECTRICAL CONDUCTIVITY- AND TEMPERATURE SENSOR)
- 5.2. MULTI-PARAMETER HANDHELD WATER QUALITY SYSTEM (WITH PH-, DISSOLVED OXYGEN-, ELECTRICAL CONDUCTIVITY- AND TEMPERATURE SENSOR) WITH WIRELESS SMART DEVICE DISPLAY CAPABILITY

6. SENSORS

- 6.1. SENSOR FOR WATER LEVEL MEASUREMENT: SHAFT ENCODER.
- 6.2. SENSOR FOR WATER LEVEL MEASUREMENT: PRESSURE TRANSDUCER: PIEZO RESISTIVE SENSOR (STAINLESS STEEL) WITH 4-20MA OUTPUT.
- 6.3. SENSOR FOR WATER LEVEL MEASUREMENT: PRESSURE TRANSDUCER: PIEZO RESISTIVE SENSOR (CERAMIC) WITH 4-20MA OUTPUT.
- 6.4. SENSOR FOR WATER LEVEL MEASUREMENT: PRESSURE TRANSDUCER: PIEZO RESISTIVE SENSOR (STAINLESS STEEL) WITH SDI12 OUTPUT.
- 6.5. SENSOR FOR WATER LEVEL MEASUREMENT: PRESSURE TRANSDUCER: PIEZO RESISTIVE SENSOR (CERAMIC) WITH SDI12 OUTPUT.
- 6.6. SENSOR FOR WATER LEVEL MEASUREMENT: BUBBLER:
- 6.7. SENSOR FOR WATER LEVEL MEASUREMENT: RADAR SENSOR WITH MEASURING RANGE: 8 METER.
- 6.8. SENSOR FOR WATER LEVEL MEASUREMENT: RADAR SENSOR WITH MEASURING RANGE: 15 METER.
- 6.9. SENSOR FOR WATER LEVEL MEASUREMENT: RADAR SENSOR WITH MEASURING RANGE: 30 METER.
- 6.10. SENSOR FOR WATER LEVEL MEASUREMENT: CONTACT GAUGE.
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- 6.12. SENSOR FOR WEATHER MEASUREMENT: RAIN GAUGE, TIPPING BUCKET WITH INTEGRATED SYPHON MECHANISM (HIGH LEVELS OF ACCURACY), POWDER COATED ALUMINIUM ONLY:
- 6.13. SENSOR FOR WEATHER MEASUREMENT: RAIN GAUGE, TIPPING BUCKET WITH INTEGRATED SYPHON MECHANISM (HIGH LEVELS OF ACCURACY), POWDER COATED ALUMINIUM/ ASA POLYMER:
- 6.14. SENSOR FOR WEATHER MEASUREMENT: RAIN GAUGE, TIPPING BUCKET WITH INTEGRATED SYPHON MECHANISM (HIGH LEVELS OF ACCURACY), FOR LOW RAINFALL EVENTS, POWDER COATED ALUMINIUM/ ASA POLYMER:
- 6.15. SENSOR FOR WEATHER MEASUREMENT: RAIN GAUGE, TIPPING BUCKET WITH INTEGRATED SYPHON MECHANISM (HIGH LEVELS OF ACCURACY), ASA POLYMER:
- 6.16. SENSOR FOR WEATHER MEASUREMENT: BAROMETRIC PRESSURE:
- 6.17. SENSOR FOR WEATHER MEASUREMENT: HUMIDITY AND AIR TEMPERATURE
- 6.18. SENSOR FOR WEATHER MEASUREMENT: WIND DIRECTION INDICATOR
- 6.19. SENSOR FOR WEATHER MEASUREMENT: NET RADIATION

7. POWER SUPPLY EQUIPMENT

- 7.1. BATTERY, SEALED, RECHARGEABLE, VALVE REGULATED LEAD-ACID SOLAR TYPE, 12 VOLT, 120 AH CAPACITY:
- 7.2. BATTERY, SEALED, RECHARGEABLE, VALVE REGULATED LEAD-ACID SOLAR TYPE, 12 VOLT, 105 AH CAPACITY:
- 7.3. BATTERY, SEALED, RECHARGEABLE, LEAD-ACID SOLAR TYPE, 12 VOLT, 40 AH CAPACITY:
- 7.4. BATTERY, SEALED, RECHARGEABLE, LEAD-ACID SOLAR TYPE, 12 VOLT, 28 AH CAPACITY:
- 7.5. BATTERY, SEALED, RECHARGEABLE, LEAD-ACID SOLAR TYPE, 12 VOLT, 12 AH CAPACITY:
- 7.6. BATTERY, SEALED, RECHARGEABLE, LEAD-CRYSTAL SOLAR TYPE, 12 VOLT, 28 AH CAPACITY:
- 7.7. BATTERY, SIZE D, LITHIUM-THIONYL CHLORIDE TYPE, 3.6 VOLT, 13 AH CAPACITY:
- 7.8. BATTERY, SIZE D, LITHIUM-THIONYL CHLORIDE TYPE, 3.6 VOLT, 13 AH CAPACITY WITH PCB CONNECTOR,
- 7.9. BATTERY, SIZE D, LITHIUM-THIONYL CHLORIDE TYPE, 3.6 VOLT, 13 AH CAPACITY WITH ELP-02V CONNECTOR:
- 7.10. BATTERY, SIZE D, LITHIUM-THIONYL CHLORIDE TYPE, 3.6 VOLT, 26 AH CAPACITY WITH ELP-02V CONNECTOR:
- 7.11. BATTERY, SIZE AA, LITHIUM-THIONYL CHLORIDE TYPE, 3.6 VOLT, 2.6 AH CAPACITY
- 7.12. BATTERY, SIZE D, TWO CELL, LITHIUM-THIONYL CHLORIDE TYPE, 3.9 VOLT, 38 AH CAPACITY WITH ATX CONNECTOR,
- 7.13. BATTERY, SIZE A, TADIRAN LITHIUM TYPE, 3.9 VOLT, 1.55 AH CAPACITY WITH TAGGED HYBRID LAYER CAPACITOR POLARISED PINS,
- 7.14. BATTERY, SIZE C, ALKALINE TYPE, 1.5 VOLT,
- 7.15. BATTERY, SIZE AA, ALKALINE TYPE, 1.5 VOLT,
- 7.16. BATTERY, SIZE AAA, ALKALINE TYPE, 1.5 VOLT,
- 7.17. SOLAR PANELS, 12 VOLT, CRYSTALLINE:
- 7.18. SOLAR CHARGE CONTROLLER:
- 7.19. POWER CONTROL UNIT OR MAINS TRANSFORMER:
- 7.20. BATTERY CHARGER:

B. HANDHELD ACOUSTIC DOPPLER CURRENT METERS

1. GENERAL: PRICE SCHEDULES

- 1.1. COMPLETION OF SCHEDULES:
- 1.2. VALUE ADDED TAX AND ROUNDING OFF:
- 1.3. PRICE ESCALATION:
- 1.4. QUANTITIES:
- 1.5. DELIVERY:

2. HANDHELD ACOUSTIC DOPPLER INSTRUMENT 1:

3. HANDHELD ACOUSTIC DOPPLER INSTRUMENT 2:

C. ACOUSTIC DOPPLER CURRENT PROFILING SYSTEMS

1. **GENERAL: PRICE SCHEDULES**

- 1.1. COMPLETION OF SCHEDULES:
- 1.2. VALUE ADDED TAX AND ROUNDING OFF:
- 1.3. PRICE ESCALATION:
- 1.4. QUANTITIES:
- 1.5. DELIVERY:

2. **ACOUSTIC DOPPLER CURRENT PROFILER 1;**

3. **ACOUSTIC DOPPLER CURRENT PROFILER 2;**

4. **ACOUSTIC DOPPLER CURRENT PROFILER 3.**

5. **ACOUSTIC DOPPLER CURRENT PROFILER 4.**

D. VANDAL RESISTANT EQUIPMENT HOUSING;

1. GENERAL: PRICE SCHEDULES

- 1.1. COMPLETION OF SCHEDULES:
- 1.2. VALUE ADDED TAX AND ROUNDING OFF:
- 1.3. PRICE ESCALATION:
- 1.4. QUANTITIES:
- 1.5. DELIVERY:

2. VANDAL RESISTANT EQUIPMENT HOUSING;

- 2.1 Custom size vandal resistant equipment hut door and frame with anti-tamper / anti-vandalism locking device:
- 2.2 Anti-Tamper / Anti-Vandalism equipment enclosures / cabinets in various sizes and with various mounting options:
- 2.3 Man-Hole cover door with Anti-Tamper / Anti-Vandalism locking device.
- 2.4 Gauge Box - Protection device for sensors with anti-tamper locking device:
- 2.5 Draw Box - Adjustable piping connector with multiple adjustable inlets and anti-tamper locking device.

A. SURFACE- AND GROUNDWATER EQUIPMENT, SENSORS, APPLICATION SOFTWARE AND ACCESSORIES

1. GENERAL: PRICE SCHEDULES

1.1. COMPLETION OF SCHEDULES:

- a. The Bidder will specify any accessories, which he/she regards as technically essential for the complete functioning of the instrumentation and which he/she considers as having to be omitted from the schedules. (**Price Schedule A**) The letters “**N/A**” should be entered in the appropriate columns if the Bidder considers the offered equipment to be complete.
- b. Should any item requested in the price schedule already form part of the main item, the Bidder shall mark these columns by filling in the word “**INCLUDED**”.
- c. The word “**NO OFFER**” should be entered in the appropriate columns if the Bidder cannot offer that specific item.
- d. All equipment spares, services, etc. will be listed in **Price Schedule B** for each main item.
- e. Any additional accessories, i.e. Power Supplies, Enclosures, etc., will be listed in **Price Schedule C** for each item.
- f. Should the Price Schedules in this Section not be adequate, additional Price Schedules should be compiled by the Bidder and included in his/her Covering Letter. Please refer clearly on the Price Schedule/s in this Section that additional Price Schedules are attached in your Covering Letter.

Failure to comply with the above-mentioned will invalidate the tender offer.

1.2. VALUE ADDED TAX AND ROUNDING OFF:

All rates shown will **include value added tax** and each item's price should be rounded off to the nearest **R 1.00**.

1.3. PRICE ESCALATION:

No price escalation for any item will be allowed.

1.4. QUANTITIES:

- a. No guarantee can be given to the Bidder with regard to the quantity of each item required.
- b. All quantities will be indicated on official orders from the various Regional Offices.

1.5. DELIVERY:

All delivery costs will be paid by the relevant Regional Offices, except in the case where the delivery address is located within a radius of 150 km from the Contactor's office/stores.

BIDDER'S SIGNATURE:

NAME OF BIDDER / COMPANY:

DATE:

2. STAND-ALONE DATA LOGGING EQUIPMENT:

2.1. PRICE SCHEDULES FOR SINGLE CHANNEL DATA LOGGER:

OFFER TO BE VALID FOR **120 DAYS** FROM THE CLOSING DATE OF BID.

| SCHEDULE A – BASIC UNIT | | |
|--------------------------|--|---------------------|
| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
| 2.1.1. | Single Channel Data Logger, complete as specified | |
| 2.1.2. | Interfacing to each Sensor (per sensor) | |
| 2.1.3. | Interfacing to Data Transmission System (per system) | |
| 2.1.4. | Bi-directional Communication Serial Cable (Data Logger ⇒ Laptop / Tablet or Smartphone) | |
| 2.1.5. | Power Supply Cable, 2m long, Including plug for Logger | |
| 2.1.6. | Lightning and Surge Protection Unit | |
| 2.1.7. | Any other accessories required for complete installation: | |
| | (a) | |
| | (b) | |
| | (c) | |
| | (d) | |
| | (e) | |
| 2.1.8. | Software package required for the operation of the Data Logger | |
| SCHEDULE B – MAINTENANCE | | |
| 2.1.9. | Cost of labour for repair / replacement of: (per hour) <ul style="list-style-type: none"> Items not covered by the guarantee (Listed in Technical Schedules), or Items which have become damaged / defective due to causes for which the manufacturer cannot be held responsible | |
| 2.1.10. | Cost of labour for General Maintenance and/or Back-up on Hardware and/or Software: (per hour) | |
| 2.1.11. | Training at the two venues: (Include traveling, accommodation and meals) <ul style="list-style-type: none"> North-West Province | |
| | <ul style="list-style-type: none"> Eastern- or Southern Cape | |

| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
|-------------------------------------|--|---------------------|
| 2.1.12. | Cost for assistance on installations for the first 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
| | | |
| | | |
| 2.1.13. | Cost for maintenance / assistance on equipment for the second 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
| | | |
| | | |
| 2.1.14. | Cost for maintenance / assistance on equipment for the third 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
| | | |
| | | |
| SCHEDULE B – SPARES | | |
| 2.1.15. | | |
| 2.1.16. | | |
| 2.1.17. | | |
| 2.1.18. | | |
| 2.1.19. | | |
| 2.1.20. | | |
| 2.1.21. | | |
| SCHEDULE C – ADDITIONAL ACCESSORIES | | |
| 2.1.22. | | |
| 2.1.23. | | |
| 2.1.24. | | |
| 2.1.25. | | |
| 2.1.26. | | |
| 2.1.27. | | |

| | | |
|---|--------------------|----------------------------|
| 2.1.28. | | |
| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
| 2.1.29. | | |
| 2.1.30. | | |
| 2.1.31. | | |
| 2.1.32. | | |
| 2.1.33. | | |
| 2.1.34. | | |
| List all items of which the Prices are NOT FIRM, i.e. Effected by Rate of Exchange | | |
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| | | |
| | | |
| | | |
| | | |
| | | |
| Applicable Rate of Exchange (On date of Signature) | | |
| = R | | |

BIDDER'S SIGNATURE:

NAME OF BIDDER / COMPANY:

DATE:

2.2. PRICE SCHEDULES FOR MULTI-CHANNEL DATA LOGGER;
OFFER TO BE VALID FOR **120 DAYS** FROM THE CLOSING DATE OF BID.

| SCHEDULE A – BASIC UNIT | | |
|--------------------------|--|---------------------|
| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
| 2.2.1. | Multi-Channel Data Logger, complete as specified | |
| 2.2.2. | Interfacing to each Sensor (per sensor) | |
| 2.2.3. | Interfacing to Data Transmission System (per system) | |
| 2.2.4. | Bi-directional Communication Serial Cable (Data Logger ⇒ Laptop / Tablet or Smartphone) | |
| 2.2.5. | Power Supply Cable, 2m long, Including plug for Logger | |
| 2.2.6. | Lightning and Surge Protection Unit | |
| 2.2.7. | Any other accessories required for complete installation: | |
| | (a) | |
| | (b) | |
| | (c) | |
| | (d) | |
| | (e) | |
| 2.2.8. | Software package required for the operation of the Data Logger | |
| SCHEDULE B – MAINTENANCE | | |
| 2.2.9. | Cost of labour for repair / replacement of: (per hour) <ul style="list-style-type: none"> Items not covered by the guarantee (Listed in Technical Schedules), or Items which have become damaged / defective due to causes for which the manufacturer cannot be held responsible | |
| 2.2.10. | Cost of labour for General Maintenance and/or Back-up on Hardware and/or Software: (per hour) | |
| 2.2.11. | Training at the two venues: (Include traveling, accommodation and meals) <ul style="list-style-type: none"> North-West Province Eastern- or Southern Cape | |
| | | |
| | | |

| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
|-------------------------------------|--|---------------------|
| 2.2.12. | Cost for assistance on installations for the first 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
| | | |
| | | |
| 2.2.13. | Cost for maintenance / assistance on equipment for the second 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
| | | |
| | | |
| 2.2.14. | Cost for maintenance / assistance on equipment for the third 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
| | | |
| | | |
| SCHEDULE B – SPARES | | |
| 2.2.15. | | |
| 2.2.16. | | |
| 2.2.17. | | |
| 2.2.18. | | |
| 2.2.19. | | |
| 2.2.20. | | |
| 2.2.21. | | |
| SCHEDULE C – ADDITIONAL ACCESSORIES | | |
| 2.2.22. | | |
| 2.2.23. | | |
| 2.2.24. | | |
| 2.2.25. | | |
| 2.2.26. | | |
| 2.2.27. | | |

| | | |
|---|--------------------|----------------------------|
| 2.2.28. | | |
| 2.2.29. | | |
| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
| 2.2.30. | | |
| 2.2.31. | | |
| 2.2.32. | | |
| 2.2.33. | | |
| 2.2.34. | | |
| 2.2.35. | | |
| List all items of which the Prices are NOT FIRM, i.e. Effected by Rate of Exchange | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| Applicable Rate of Exchange (On date of Signature) | | |
| = R | | |

BIDDER’S SIGNATURE:

NAME OF BIDDER / COMPANY:

DATE:

3. INTEGRATED DATA LOGGER WITH INTEGRATED SENSORS

- 3.1. PRICE SCHEDULES FOR SINGLE CHANNEL DATA LOGGER WITH INTEGRATED SENSOR: SHAFT ENCODER;
OFFER TO BE VALID FOR **120 DAYS** FROM THE CLOSING DATE OF BID.

| SCHEDULE A – BASIC UNIT | | |
|--------------------------|--|---------------------|
| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
| 3.1.1. | Single Channel Data Logger with integrated sensor: Shaft Encoder, complete as specified | |
| 3.1.2. | Interfacing to each Sensor (per sensor) | |
| 3.1.3. | Interfacing to Data Transmission System (per system) | |
| 3.1.4. | Bi-directional Communication Serial Cable (Data Logger ⇒ Laptop / Tablet or Smartphone) | |
| 3.1.5. | Power Supply Cable, 2m long, Including plug for Logger | |
| 3.1.6. | Lightning and Surge Protection Unit | |
| 3.1.7. | Any other accessories required for complete installation: | |
| | (a) | |
| | (b) | |
| | (c) | |
| | (d) | |
| | (e) | |
| 3.1.8. | Software package required for the operation of the Data Logger | |
| SCHEDULE B – MAINTENANCE | | |
| 3.1.9. | Cost of labour for repair / replacement of: (per hour) <ul style="list-style-type: none"> Items not covered by the guarantee (Listed in Technical Schedules), or Items which have become damaged / defective due to causes for which the manufacturer cannot be held responsible | |
| 3.1.10. | Cost of labour for General Maintenance and/or Back-up on Hardware and/or Software: (per hour) | |
| 3.1.11. | Training at the two venues: (Include traveling, accommodation and meals) <ul style="list-style-type: none"> North-West Province | |

| | <ul style="list-style-type: none">• Eastern- or Southern Cape | |
|-------------------------------------|--|---------------------|
| | | |
| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
| 3.1.12. | Cost for assistance on installations for the first 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
| | | |
| | | |
| 3.1.13. | Cost for maintenance / assistance on equipment for the second 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
| | | |
| | | |
| 3.1.14. | Cost for maintenance / assistance on equipment for the third 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
| | | |
| | | |
| SCHEDULE B – SPARES | | |
| 3.1.15. | | |
| 3.1.16. | | |
| 3.1.17. | | |
| 3.1.18. | | |
| 3.1.19. | | |
| 3.1.20. | | |
| 3.1.21. | | |
| SCHEDULE C – ADDITIONAL ACCESSORIES | | |
| 3.1.22. | | |
| 3.1.23. | | |
| 3.1.24. | | |
| 3.1.25. | | |
| 3.1.26. | | |

| | | |
|---|--------------------|----------------------------|
| 3.1.27. | | |
| 3.1.28. | | |
| 3.1.29. | | |
| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
| 3.1.30. | | |
| 3.1.31. | | |
| 3.1.32. | | |
| 3.1.33. | | |
| 3.1.34. | | |
| 3.1.35. | | |
| List all items of which the Prices are NOT FIRM, i.e. Effected by Rate of Exchange | | |
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| Applicable Rate of Exchange (On date of Signature) | | |
| = R | | |

BIDDER'S SIGNATURE:

NAME OF BIDDER / COMPANY:

DATE:

3.2. PRICE SCHEDULES FOR SINGLE CHANNEL DATA LOGGER WITH INTEGRATED SENSOR: PRESSURE TRANSDUCER (VENTED);
OFFER TO BE VALID FOR **120 DAYS** FROM THE CLOSING DATE OF BID.

| SCHEDULE A – BASIC UNIT | | |
|--------------------------|--|---|
| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
| 3.2.1. | Single Channel Data Logger with integrated sensor: Pressure Transducer (vented), complete as specified | |
| 3.2.2.a | Transducer Cable (per sensor) | Normal Cable (per meter) |
| 3.2.2.b | | Strengthened Cable (per meter) |
| 3.2.3. | Interfacing to Data Transmission System (per system) | |
| 3.2.4. | Bi-directional Communication Serial Cable (Data Logger ⇒ Laptop / Tablet or Smartphone) | |
| 3.2.5. | Power Supply Cable, 2m long, Including plug for Logger | |
| 3.2.6. | Lightning and Surge Protection Unit | |
| 3.2.7. | Any other accessories required for complete installation: | |
| | (a) | |
| | (b) | |
| | (c) | |
| | (d) | |
| | (e) | |
| 3.2.8. | Software package required for the operation of the Data Logger | |
| SCHEDULE B – MAINTENANCE | | |
| 3.2.9. | Cost of labour for repair / replacement of: (per hour) <ul style="list-style-type: none"> Items not covered by the guarantee (Listed in Technical Schedules), or Items which have become damaged / defective due to causes for which the manufacturer cannot be held responsible | |
| 3.2.10. | Cost of labour for General Maintenance and/or Back-up on Hardware and/or Software: (per hour) | |

| 3.2.11. | Training at the two venues: (Include traveling, accommodation and meals) | |
|-------------------------------------|--|---------------------|
| | • North-West Province | |
| | • Eastern- or Southern Cape | |
| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
| 3.2.12. | Cost for assistance on installations for the first 12 months at any gauging station in the RSA. | |
| | (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
| | | |
| 3.2.13. | Cost for maintenance / assistance on equipment for the second 12 months at any gauging station in the RSA. | |
| | (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
| | | |
| 3.2.14. | Cost for maintenance / assistance on equipment for the third 12 months at any gauging station in the RSA. | |
| | (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
| | | |
| SCHEDULE B – SPARES | | |
| 3.2.15. | | |
| 3.2.16. | | |
| 3.2.17. | | |
| 3.2.18. | | |
| 3.2.19. | | |
| 3.2.20. | | |
| 3.2.21. | | |
| SCHEDULE C – ADDITIONAL ACCESSORIES | | |
| 3.2.22. | | |
| 3.2.23. | | |
| 3.2.24. | | |

| 3.2.25. | | |
|---|-------------|---------------------|
| 3.2.26. | | |
| 3.2.27. | | |
| 3.2.28. | | |
| 3.2.29. | | |
| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
| 3.2.30. | | |
| 3.2.31. | | |
| 3.2.32. | | |
| 3.2.33. | | |
| 3.2.34. | | |
| 3.2.35. | | |
| List all items of which the Prices are NOT FIRM, i.e. Effected by Rate of Exchange | | |
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| Applicable Rate of Exchange (On date of Signature) | | |
| = R | | |

BIDDER'S SIGNATURE:

NAME OF BIDDER / COMPANY:

DATE:

3.3. PRICE SCHEDULES FOR SINGLE CHANNEL DATA LOGGER WITH INTEGRATED SENSOR: BAROMETRIC PRESSURE;
OFFER TO BE VALID FOR **120 DAYS** FROM THE CLOSING DATE OF BID.

| SCHEDULE A – BASIC UNIT | | |
|--------------------------|--|---------------------|
| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
| 3.3.1. | Single Channel Data Logger with integrated sensor: Barometric Pressure, complete as specified | |
| 3.3.2. | Bi-directional Communication Serial Cable (Data Logger ⇒ Laptop / Tablet or Smartphone) | |
| 3.3.3. | Any other accessories required for complete installation: | |
| | (a) | |
| | (b) | |
| | (c) | |
| | (d) | |
| | (e) | |
| 3.3.4. | Software package required for the operation of the Data Logger | |
| SCHEDULE B – MAINTENANCE | | |
| 3.3.5. | Cost of labour for repair / replacement of: (per hour) <ul style="list-style-type: none"> Items not covered by the guarantee (Listed in Technical Schedules), or Items which have become damaged / defective due to causes for which the manufacturer cannot be held responsible | |
| 3.3.6. | Cost of labour for General Maintenance and/or Back-up on Hardware and/or Software: (per hour) | |
| 3.3.7. | Training at the two venues: (Include traveling, accommodation and meals) <ul style="list-style-type: none"> North-West Province Eastern- or Southern Cape | |
| | | |
| | | |

| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
|-------------------------------------|--|---------------------|
| 3.3.8. | Cost for assistance on installations for the first 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
| | | |
| | | |
| 3.3.9. | Cost for maintenance / assistance on equipment for the second 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
| | | |
| | | |
| 3.3.10. | Cost for maintenance / assistance on equipment for the third 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
| | | |
| | | |
| SCHEDULE B – SPARES | | |
| 3.3.11. | | |
| 3.3.12. | | |
| 3.3.13. | | |
| 3.3.14. | | |
| 3.3.15. | | |
| 3.3.16. | | |
| 3.3.17. | | |
| SCHEDULE C – ADDITIONAL ACCESSORIES | | |
| 3.3.18. | | |
| 3.3.19. | | |
| 3.3.20. | | |
| 3.3.21. | | |
| 3.3.22. | | |
| 3.3.23. | | |

| | | |
|---|--------------------|----------------------------|
| 3.3.24. | | |
| 3.3.25. | | |
| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
| 3.3.26. | | |
| 3.3.27. | | |
| 3.3.28. | | |
| 3.3.29. | | |
| 3.3.30. | | |
| 3.3.31. | | |
| List all items of which the Prices are NOT FIRM, i.e. Effected by Rate of Exchange | | |
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| | | |
| Applicable Rate of Exchange (On date of Signature) | | |
| = R | | |

BIDDER’S SIGNATURE:

NAME OF BIDDER / COMPANY:

DATE:

- 3.4. PRICE SCHEDULES FOR MULTI-CHANNEL DATA LOGGER WITH INTEGRATED SENSORS: PRESSURE TRANSDUCER (VENTED) AND TEMPERATURE SENSOR; OFFER TO BE VALID FOR **120 DAYS** FROM THE CLOSING DATE OF BID.

| SCHEDULE A – BASIC UNIT | | |
|--------------------------|--|---|
| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
| 3.4.1. | Multi-Channel Data Logger with integrated sensors: Pressure Transducer (vented) and temperature, complete as specified | |
| 3.4.2. a | Transducer Cable (per sensor) | Normal Cable (per meter) |
| 3.4.2. b | | Strengthened Cable (per meter) |
| 3.4.3. | Interfacing to Data Transmission System (per system) | |
| 3.4.4. | Bi-directional Communication Serial Cable (Data Logger ⇒ Laptop / Tablet or Smartphone) | |
| 3.4.5. | Power Supply Cable, 2m long, Including plug for Logger | |
| 3.4.6. | Lightning and Surge Protection Unit | |
| 3.4.7. | Any other accessories required for complete installation: | |
| | (a) | |
| | (b) | |
| | (c) | |
| | (d) | |
| | (e) | |
| 3.4.8. | Software package required for the operation of the Data Logger | |
| SCHEDULE B – MAINTENANCE | | |
| 3.4.9. | Cost of labour for repair / replacement of: (per hour) <ul style="list-style-type: none"> Items not covered by the guarantee (Listed in Technical Schedules), or Items which have become damaged / defective due to causes for which the manufacturer cannot be held responsible | |
| 3.4.10. | Cost of labour for General Maintenance and/or Back-up on Hardware and/or Software: (per hour) | |

| 3.4.11. | Training at the two venues: (Include traveling, accommodation and meals) <ul style="list-style-type: none">• North-West Province• Eastern- or Southern Cape | |
|-------------------------------------|--|---------------------|
| | | |
| | | |
| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
| 3.4.12. | Cost for assistance on installations for the first 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
| | | |
| | | |
| 3.4.13. | Cost for maintenance / assistance on equipment for the second 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
| | | |
| | | |
| 3.4.14. | Cost for maintenance / assistance on equipment for the third 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
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| | | |
| SCHEDULE B – SPARES | | |
| 3.4.15. | | |
| 3.4.16. | | |
| 3.4.17. | | |
| 3.4.18. | | |
| 3.4.19. | | |
| 3.4.20. | | |
| 3.4.21. | | |
| SCHEDULE C – ADDITIONAL ACCESSORIES | | |
| 3.4.22. | | |
| 3.4.23. | | |
| 3.4.24. | | |

| 3.4.25. | | |
|---|-------------|---------------------|
| 3.4.26. | | |
| 3.4.27. | | |
| 3.4.28. | | |
| 3.4.29. | | |
| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
| 3.4.30. | | |
| 3.4.31. | | |
| 3.4.32. | | |
| 3.4.33. | | |
| 3.4.34. | | |
| 3.4.35. | | |
| List all items of which the Prices are NOT FIRM, i.e. Effected by Rate of Exchange | | |
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| Applicable Rate of Exchange (On date of Signature) | | |
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BIDDER’S SIGNATURE:

NAME OF BIDDER / COMPANY:

DATE:

- 3.5. PRICE SCHEDULES FOR MULTI-CHANNEL DATA LOGGER WITH INTEGRATED SENSORS: PRESSURE TRANSDUCER (VENTED) AND TEMPERATURE SENSOR WITH INTEGRATED GSM MODEM;
OFFER TO BE VALID FOR **120 DAYS** FROM THE CLOSING DATE OF BID.

| SCHEDULE A – BASIC UNIT | | |
|--------------------------|---|---|
| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
| 3.5.1. | Multi-Channel Data Logger with integrated sensors: Pressure Transducer (vented) and temperature with integrated GSM Modem, complete as specified | |
| 3.5.2. a | Transducer Cable (per sensor) | Normal Cable (per meter) |
| 3.5.2. b | | Strengthened Cable (per meter) |
| 3.5.3. | Interfacing to Data Transmission System (per system) | |
| 3.5.4. | Bi-directional Communication Serial Cable (Data Logger ⇒ Laptop / Tablet or Smartphone) | |
| 3.5.5. | Power Supply Cable, 2m long, Including plug for Logger | |
| 3.5.6. | Lightning and Surge Protection Unit | |
| 3.5.7. | Any other accessories required for complete installation: (a) | |
| | (b) | |
| | (c) | |
| | (d) | |
| | (e) | |
| 3.5.8. | Software package required for the operation of the Data Logger | |
| SCHEDULE B – MAINTENANCE | | |
| 3.5.9. | Cost of labour for repair / replacement of: (per hour) <ul style="list-style-type: none"> Items not covered by the guarantee (Listed in Technical Schedules), or Items which have become damaged / defective due to causes for which the manufacturer cannot be held responsible | |
| 3.5.10. | Cost of labour for General Maintenance and/or Back-up on Hardware and/or Software: (per hour) | |

| 3.5.11. | Training at the two venues: (Include traveling, accommodation and meals) <ul style="list-style-type: none">• North-West Province• Eastern- or Southern Cape | |
|-------------------------------------|--|---------------------|
| | | |
| | | |
| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
| 3.5.12. | Cost for assistance on installations for the first 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
| | | |
| | | |
| 3.5.13. | Cost for maintenance / assistance on equipment for the second 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
| | | |
| | | |
| 3.5.14. | Cost for maintenance / assistance on equipment for the third 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
| | | |
| | | |
| SCHEDULE B – SPARES | | |
| 3.5.15. | | |
| 3.5.16. | | |
| 3.5.17. | | |
| 3.5.18. | | |
| 3.5.19. | | |
| 3.5.20. | | |
| 3.5.21. | | |
| SCHEDULE C – ADDITIONAL ACCESSORIES | | |
| 3.5.22. | | |
| 3.5.23. | | |
| 3.5.24. | | |

| 3.5.25. | | |
|---|-------------|---------------------|
| 3.5.26. | | |
| 3.5.27. | | |
| 3.5.28. | | |
| 3.5.29. | | |
| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
| 3.5.30. | | |
| 3.5.31. | | |
| 3.5.32. | | |
| 3.5.33. | | |
| 3.5.34. | | |
| 3.5.35. | | |
| List all items of which the Prices are NOT FIRM, i.e. Effected by Rate of Exchange | | |
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| | | |
| Applicable Rate of Exchange (On date of Signature) | | |
| = R | | |

BIDDER'S SIGNATURE:

NAME OF BIDDER / COMPANY:

DATE:

- 3.6. PRICE SCHEDULES FOR MULTI-CHANNEL DATA LOGGER WITH INTEGRATED SENSORS: PRESSURE TRANSDUCER (VENTED), TEMPERATURE- AND CONDUCTIVITY SENSOR WITH INTEGRATED GSM MODEM;
OFFER TO BE VALID FOR **120 DAYS** FROM THE CLOSING DATE OF BID.

| SCHEDULE A – BASIC UNIT | | |
|--------------------------|---|---|
| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
| 3.6.1. | Multi-Channel Data Logger with integrated sensors: Pressure Transducer (vented), temperature- and conductivity sensor with integrated GSM modem, complete as specified | |
| 3.6.2. a | Transducer Cable (per sensor) | Normal Cable (per meter) |
| 3.6.2. b | | Strengthened Cable (per meter) |
| 3.6.3. | Interfacing to Data Transmission System (per system) | |
| 3.6.4. | Bi-directional Communication Serial Cable (Data Logger ⇒ Laptop / Tablet or Smartphone) | |
| 3.6.5. | Power Supply Cable, 2m long, Including plug for Logger | |
| 3.6.6. | Lightning and Surge Protection Unit | |
| 3.6.7. | Any other accessories required for complete installation: (a) | |
| | (b) | |
| | (c) | |
| | (d) | |
| | (e) | |
| 3.6.8. | Software package required for the operation of the Data Logger | |
| SCHEDULE B – MAINTENANCE | | |
| 3.6.9. | Cost of labour for repair / replacement of: (per hour) <ul style="list-style-type: none"> Items not covered by the guarantee (Listed in Technical Schedules), or Items which have become damaged / defective due to causes for which the manufacturer cannot be held responsible | |
| 3.6.10. | Cost of labour for General Maintenance and/or Back-up on Hardware and/or Software: (per hour) | |

| 3.6.11. | Training at the two venues: (Include traveling, accommodation and meals) <ul style="list-style-type: none">• North-West Province• Eastern- or Southern Cape | |
|-------------------------------------|--|---------------------|
| | | |
| | | |
| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
| 3.6.12. | Cost for assistance on installations for the first 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
| | | |
| | | |
| 3.6.13. | Cost for maintenance / assistance on equipment for the second 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
| | | |
| | | |
| 3.6.14. | Cost for maintenance / assistance on equipment for the third 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
| | | |
| | | |
| SCHEDULE B – SPARES | | |
| 3.6.15. | | |
| 3.6.16. | | |
| 3.6.17. | | |
| 3.6.18. | | |
| 3.6.19. | | |
| 3.6.20. | | |
| 3.6.21. | | |
| SCHEDULE C – ADDITIONAL ACCESSORIES | | |
| 3.6.22. | | |
| 3.6.23. | | |
| 3.6.24. | | |

| 3.6.25. | | |
|---|-------------|---------------------|
| 3.6.26. | | |
| 3.6.27. | | |
| 3.6.28. | | |
| 3.6.29. | | |
| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
| 3.6.30. | | |
| 3.6.31. | | |
| 3.6.32. | | |
| 3.6.33. | | |
| 3.6.34. | | |
| 3.6.35. | | |
| List all items of which the Prices are NOT FIRM, i.e. Effected by Rate of Exchange | | |
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| | | |
| Applicable Rate of Exchange (On date of Signature) | | |
| = R | | |

BIDDER’S SIGNATURE:

NAME OF BIDDER / COMPANY:

DATE:

3.7. PRICE SCHEDULES FOR MULTI-CHANNEL DATA LOGGER WITH INTEGRATED SENSORS: PRESSURE TRANSDUCER (NON-VENTED) AND TEMPERATURE SENSOR.

OFFER TO BE VALID FOR **120 DAYS** FROM THE CLOSING DATE OF BID.

| SCHEDULE A – BASIC UNIT | | |
|--------------------------|--|---------------------|
| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
| 3.7.1. | Multi-Channel Data Logger with integrated sensors: Pressure Transducer (non-vented) and temperature sensor, complete as specified | |
| 3.7.2. | Bi-directional Communication Serial Cable (Data Logger ⇒ Laptop / Tablet or Smartphone) | |
| 3.7.3. | Software package required for the operation of the Data Logger | |
| SCHEDULE B – MAINTENANCE | | |
| 3.7.4. | Cost of labour for repair / replacement of: (per hour) <ul style="list-style-type: none"> Items not covered by the guarantee (Listed in Technical Schedules), or Items which have become damaged / defective due to causes for which the manufacturer cannot be held responsible | |
| 3.7.5. | Cost of labour for General Maintenance and/or Back-up on Hardware and/or Software: (per hour) | |
| 3.7.6. | Training at the two venues: (Include traveling, accommodation and meals) <ul style="list-style-type: none"> North-West Province Eastern- or Southern Cape | |
| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
| 3.7.7. | Cost for assistance on installations for the first 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
| 3.7.8. | Cost for maintenance / assistance on equipment for the second 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |

| | | |
|-------------------------------------|---|---------------------|
| 3.7.9. | Cost for maintenance / assistance on equipment for the third 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
| | | |
| | | |
| SCHEDULE B – SPARES | | |
| 3.7.10. | | |
| 3.7.11. | | |
| 3.7.12. | | |
| 3.7.13. | | |
| 3.7.14. | | |
| 3.7.15. | | |
| 3.7.16. | | |
| SCHEDULE C – ADDITIONAL ACCESSORIES | | |
| 3.7.17. | | |
| 3.7.18. | | |
| 3.7.19. | | |
| 3.7.20. | | |
| 3.7.21. | | |
| 3.7.22. | | |
| 3.7.23. | | |
| 3.7.24. | | |
| 3.7.25. | | |
| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
| 3.7.26. | | |
| 3.7.27. | | |
| 3.7.28. | | |
| 3.7.29. | | |

| | | |
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| 3.7.30. | | |
| 3.7.31. | | |
| List all items of which the Prices are NOT FIRM, i.e. Effected by Rate of Exchange | | |
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| Applicable Rate of Exchange (On date of Signature) | | |
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BIDDER'S SIGNATURE:

NAME OF BIDDER / COMPANY:

DATE:

- 3.8. PRICE SCHEDULES FOR MULTI-CHANNEL DATA LOGGER WITH INTEGRATED SENSORS: PRESSURE TRANSDUCER (NON-VENTED) AND TEMPERATURE SENSOR; WITH BAROMETRIC PRESSURE COMPENSATOR.
OFFER TO BE VALID FOR **120 DAYS** FROM THE CLOSING DATE OF BID.

| SCHEDULE A – BASIC UNIT | | |
|--------------------------|--|---------------------|
| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
| 3.8.1. | Multi-Channel Data Logger with integrated sensors: Pressure Transducer (non-vented) and temperature sensor, with barometric pressure compensator, complete as specified | |
| 3.8.2. | Bi-directional Communication Serial Cable (Data Logger ⇒ Laptop / Tablet or Smartphone) | |
| 3.8.3. | Any other accessories required for complete installation: | |
| | (a) | |
| | (b) | |
| | (c) | |
| | (d) | |
| | (e) | |
| 3.8.4. | Software package required for the operation of the Data Logger | |
| SCHEDULE B – MAINTENANCE | | |
| 3.8.5. | Cost of labour for repair / replacement of: (per hour) <ul style="list-style-type: none"> Items not covered by the guarantee (Listed in Technical Schedules), or Items which have become damaged / defective due to causes for which the manufacturer cannot be held responsible | |
| 3.8.6. | Cost of labour for General Maintenance and/or Back-up on Hardware and/or Software: (per hour) | |
| 3.8.7. | Training at the two venues: (Include traveling, accommodation and meals) | |
| | <ul style="list-style-type: none"> North-West Province | |
| | <ul style="list-style-type: none"> Eastern- or Southern Cape | |

| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
|-------------------------------------|--|---------------------|
| 3.8.8. | Cost for assistance on installations for the first 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
| | | |
| | | |
| 3.8.9. | Cost for maintenance / assistance on equipment for the second 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
| | | |
| | | |
| 3.8.10. | Cost for maintenance / assistance on equipment for the third 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
| | | |
| | | |
| SCHEDULE B – SPARES | | |
| 3.8.11. | | |
| 3.8.12. | | |
| 3.8.13. | | |
| 3.8.14. | | |
| 3.8.15. | | |
| 3.8.16. | | |
| 3.8.17. | | |
| SCHEDULE C – ADDITIONAL ACCESSORIES | | |
| 3.8.18. | | |
| 3.8.19. | | |
| 3.8.20. | | |
| 3.8.21. | | |
| 3.8.22. | | |
| 3.8.23. | | |
| 3.8.24. | | |

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| 3.8.25. | | |
| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
| 3.8.26. | | |
| 3.8.27. | | |
| 3.8.28. | | |
| 3.8.29. | | |
| 3.8.30. | | |
| 3.8.31. | | |
| List all items of which the Prices are NOT FIRM, i.e. Effected by Rate of Exchange | | |
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| Applicable Rate of Exchange (On date of Signature) | | |
| = R | | |

BIDDER'S SIGNATURE:

NAME OF BIDDER / COMPANY:

DATE:

3.9. PRICE SCHEDULES FOR MULTI-CHANNEL DATA LOGGER WITH INTEGRATED SENSORS: PRESSURE TRANSDUCER (NON-VENTED), TEMPERATURE- AND CONDUCTIVITY SENSOR.

OFFER TO BE VALID FOR **120 DAYS** FROM THE CLOSING DATE OF BID.

| SCHEDULE A – BASIC UNIT | | |
|--------------------------|--|---------------------|
| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
| 3.9.1. | Multi-Channel Data Logger with integrated sensors: Pressure Transducer (non-vented), temperature- and conductivity sensor, complete as specified | |
| 3.9.2. | Bi-directional Communication Serial Cable (Data Logger ⇒ Laptop / Tablet or Smartphone) | |
| 3.9.3. | Any other accessories required for complete installation: | |
| | (a) | |
| | (b) | |
| | (c) | |
| | (d) | |
| | (e) | |
| 3.9.4. | Software package required for the operation of the Data Logger | |
| SCHEDULE B – MAINTENANCE | | |
| 3.9.5. | Cost of labour for repair / replacement of: (per hour) <ul style="list-style-type: none"> Items not covered by the guarantee (Listed in Technical Schedules), or Items which have become damaged / defective due to causes for which the manufacturer cannot be held responsible | |
| 3.9.6. | Cost of labour for General Maintenance and/or Back-up on Hardware and/or Software: (per hour) | |
| 3.9.7. | Training at the two venues: (Include traveling, accommodation and meals) <ul style="list-style-type: none"> North-West Province Eastern- or Southern Cape | |
| | | |
| | | |

| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
|-------------------------------------|--|---------------------|
| 3.9.8. | Cost for assistance on installations for the first 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
| | | |
| | | |
| 3.9.9. | Cost for maintenance / assistance on equipment for the second 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
| | | |
| | | |
| 3.9.10. | Cost for maintenance / assistance on equipment for the third 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
| | | |
| | | |
| SCHEDULE B – SPARES | | |
| 3.9.11. | | |
| 3.9.12. | | |
| 3.9.13. | | |
| 3.9.14. | | |
| 3.9.15. | | |
| 3.9.16. | | |
| 3.9.17. | | |
| SCHEDULE C – ADDITIONAL ACCESSORIES | | |
| 3.9.18. | | |
| 3.9.19. | | |
| 3.9.20. | | |
| 3.9.21. | | |
| 3.9.22. | | |
| 3.9.23. | | |
| 3.9.24. | | |

| | | |
|---|--------------------|----------------------------|
| 3.9.25. | | |
| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
| 3.9.26. | | |
| 3.9.27. | | |
| 3.9.28. | | |
| 3.9.29. | | |
| 3.9.30. | | |
| 3.9.31. | | |
| List all items of which the Prices are NOT FIRM, i.e. Effected by Rate of Exchange | | |
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| Applicable Rate of Exchange (On date of Signature) | | |
| = R | | |

BIDDER'S SIGNATURE:

NAME OF BIDDER / COMPANY:

DATE:

3.10. PRICE SCHEDULES FOR MULTI-CHANNEL DATA LOGGER WITH INTEGRATED SENSORS: PRESSURE TRANSDUCER (NON-VENTED), TEMPERATURE- AND CONDUCTIVITY SENSOR; WITH BAROMETRIC PRESSURE COMPENSATOR: OFFER TO BE VALID FOR **120 DAYS** FROM THE CLOSING DATE OF BID.

| SCHEDULE A – BASIC UNIT | | |
|--------------------------|--|---------------------|
| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
| 3.10.1. | Multi-Channel Data Logger with integrated sensors: Pressure Transducer (non-vented), temperature- and conductivity sensor, with barometric pressure compensator, complete as specified | |
| 3.10.2. | Bi-directional Communication Serial Cable (Data Logger ⇒ Laptop / Tablet or Smartphone) | |
| 3.10.3. | Any other accessories required for complete installation: | |
| | (a) | |
| | (b) | |
| | (c) | |
| | (d) | |
| | (e) | |
| 3.10.4. | Software package required for the operation of the Data Logger | |
| SCHEDULE B – MAINTENANCE | | |
| 3.10.5. | Cost of labour for repair / replacement of: (per hour) <ul style="list-style-type: none"> Items not covered by the guarantee (Listed in Technical Schedules), or Items which have become damaged / defective due to causes for which the manufacturer cannot be held responsible | |
| 3.10.6. | Cost of labour for General Maintenance and/or Back-up on Hardware and/or Software: (per hour) | |
| 3.10.7. | Training at the two venues: (Include traveling, accommodation and meals) | |
| | • North-West Province | |
| | • Eastern- or Southern Cape | |

| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
|-------------------------------------|--|---------------------|
| 3.10.8. | Cost for assistance on installations for the first 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
| | | |
| | | |
| 3.10.9. | Cost for maintenance / assistance on equipment for the second 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
| | | |
| | | |
| 3.10.10. | Cost for maintenance / assistance on equipment for the third 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
| | | |
| | | |
| SCHEDULE B – SPARES | | |
| 3.10.11. | | |
| 3.10.12. | | |
| 3.10.13. | | |
| 3.10.14. | | |
| 3.10.15. | | |
| 3.10.16. | | |
| 3.10.17. | | |
| SCHEDULE C – ADDITIONAL ACCESSORIES | | |
| 3.10.18. | | |
| 3.10.19. | | |
| 3.10.20. | | |
| 3.10.21. | | |
| 3.10.22. | | |
| 3.10.23. | | |
| 3.10.24. | | |

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| 3.10.25. | | |
| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
| 3.10.26. | | |
| 3.10.27. | | |
| 3.10.28. | | |
| 3.10.29. | | |
| 3.10.30. | | |
| 3.10.31. | | |
| List all items of which the Prices are NOT FIRM, i.e. Effected by Rate of Exchange | | |
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| Applicable Rate of Exchange (On date of Signature) | | |
| = R | | |

BIDDER'S SIGNATURE:

NAME OF BIDDER / COMPANY:

DATE:

3.11. PRICE SCHEDULES FOR MULTI-CHANNEL DATA LOGGER WITH INTEGRATED PRESSURE (NON-VENTED), TEMPERATURE AND CONDUCTIVITY SENSORS – FOR UNATTENDED DEPLOYMENT WITH NO CABLES ATTACHED:
OFFER TO BE VALID FOR **120 DAYS** FROM THE CLOSING DATE OF BID.

| SCHEDULE A – BASIC UNIT | | |
|--------------------------|--|---------------------|
| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
| 3.11.1. | Multi-Channel Data Logger with integrated pressure, temperature and conductivity sensors - for unattended deployment with no cables attached, complete as specified | |
| 3.11.2. | Interfacing to Data Transmission System (per system) | |
| 3.11.3. | Bi-directional Communication Serial Cable (Data Logger ⇒ Laptop / Tablet or Smartphone) | |
| 3.11.4. | Power Supply Cable, 2m long, Including plug for Logger | |
| 3.11.5. | Lightning and Surge Protection Unit | |
| 3.11.6. | Any other accessories required for complete installation: | |
| | (a) | |
| | (b) | |
| | (c) | |
| | (d) | |
| | (e) | |
| 3.11.7. | Software package required for the operation of the Data Logger | |
| SCHEDULE B – MAINTENANCE | | |
| 3.11.8. | Cost of labour for repair / replacement of: (per hour) <ul style="list-style-type: none"> Items not covered by the guarantee (Listed in Technical Schedules), or Items which have become damaged / defective due to causes for which the manufacturer cannot be held responsible | |
| 3.11.9. | Cost of labour for General Maintenance and/or Back-up on Hardware and/or Software: (per hour) | |
| 3.11.10. | Training at the two venues: (Include traveling, accommodation and meals) <ul style="list-style-type: none"> North-West Province | |

| | <ul style="list-style-type: none"> • Eastern- or Southern Cape | |
|-------------------------------------|--|---------------------|
| | | |
| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
| 3.11.11. | Cost for assistance on installations for the first 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
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| | | |
| 3.11.12. | Cost for maintenance / assistance on equipment for the second 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
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| | | |
| 3.11.13. | Cost for maintenance / assistance on equipment for the third 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
| | | |
| | | |
| SCHEDULE B – SPARES | | |
| 3.11.14. | | |
| 3.11.15. | | |
| 3.11.16. | | |
| 3.11.17. | | |
| 3.11.18. | | |
| 3.11.19. | | |
| SCHEDULE C – ADDITIONAL ACCESSORIES | | |
| 3.11.20. | | |
| 3.11.21. | | |
| 3.11.22. | | |
| 3.11.23. | | |
| 3.11.24. | | |
| 3.11.25. | | |

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| 3.11.26. | | |
| 3.11.27. | | |
| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
| 3.11.28. | | |
| 3.11.29. | | |
| 3.11.30. | | |
| 3.11.31. | | |
| 3.11.32. | | |
| 3.11.33. | | |
| List all items of which the Prices are NOT FIRM, i.e. Effected by Rate of Exchange | | |
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| Applicable Rate of Exchange (On date of Signature) | | |
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BIDDER’S SIGNATURE:

NAME OF BIDDER / COMPANY:

DATE:

- 3.12. PRICE SCHEDULES FOR MULTI-CHANNEL DATA LOGGER WITH INTEGRATED PRESSURE (NON-VENTED), TEMPERATURE AND CONDUCTIVITY SENSORS, WITH PRACTICAL SALINITY SCALE OUTPUT – FOR UNATTENDED DEPLOYMENT WITH NO CABLES ATTACHED:
OFFER TO BE VALID FOR **120 DAYS** FROM THE CLOSING DATE OF BID.

| SCHEDULE A – BASIC UNIT | | |
|--------------------------|--|---------------------|
| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
| 3.12.1. | Multi-Channel Data Logger with integrated pressure, temperature and conductivity sensors, with practical salinity scale output - for unattended deployment with no cables attached, complete as specified | |
| 3.12.2. | Interfacing to Data Transmission System (per system) | |
| 3.12.3. | Bi-directional Communication Serial Cable (Data Logger ⇒ Laptop / Tablet or Smartphone) | |
| 3.12.4. | Power Supply Cable, 2m long, Including plug for Logger | |
| 3.12.5. | Lightning and Surge Protection Unit | |
| 3.12.6. | Any other accessories required for complete installation: | |
| | (a) | |
| | (b) | |
| | (c) | |
| | (d) | |
| | (e) | |
| 3.12.7. | Software package required for the operation of the Data Logger | |
| SCHEDULE B – MAINTENANCE | | |
| 3.12.8. | Cost of labour for repair / replacement of: (per hour) <ul style="list-style-type: none"> Items not covered by the guarantee (Listed in Technical Schedules), or Items which have become damaged / defective due to causes for which the manufacturer cannot be held responsible | |
| 3.12.9. | Cost of labour for General Maintenance and/or Back-up on Hardware and/or Software: (per hour) | |

| 3.12.10. | Training at the two venues: (Include traveling, accommodation and meals) <ul style="list-style-type: none">• North-West Province• Eastern- or Southern Cape | |
|-------------------------------------|--|---------------------|
| | | |
| | | |
| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
| 3.12.11. | Cost for assistance on installations for the first 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
| | | |
| | | |
| 3.12.12. | Cost for maintenance / assistance on equipment for the second 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
| | | |
| | | |
| 3.12.13. | Cost for maintenance / assistance on equipment for the third 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
| | | |
| | | |
| SCHEDULE B – SPARES | | |
| 3.12.14. | | |
| 3.12.15. | | |
| 3.12.16. | | |
| 3.12.17. | | |
| 3.12.18. | | |
| 3.12.19. | | |
| 3.12.20. | | |
| SCHEDULE C – ADDITIONAL ACCESSORIES | | |
| 3.12.21. | | |
| 3.12.22. | | |
| 3.12.23. | | |

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| 3.12.24. | | |
| 3.12.25. | | |
| 3.12.26. | | |
| 3.12.27. | | |
| 3.12.28. | | |
| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
| 3.12.29. | | |
| 3.12.30. | | |
| 3.12.31. | | |
| 3.12.32. | | |
| 3.12.33. | | |
| 3.12.34. | | |
| List all items of which the Prices are NOT FIRM, i.e. Effected by Rate of Exchange | | |
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| | | |
| Applicable Rate of Exchange (On date of Signature) | | |
| = R | | |

BIDDER'S SIGNATURE:

NAME OF BIDDER / COMPANY:

DATE:

3.13. PRICE SCHEDULES FOR MULTI-CHANNEL DATA LOGGER WITH INTEGRATED LEVEL, TEMPERATURE AND CONDUCTIVITY SENSORS – FOR PERMANENT SUBMERGED DEPLOYMENT WITH FIXED (NON-REMOVABLE) COMMUNICATION CABLE AND VENTED TUBE:

OFFER TO BE VALID FOR **120 DAYS** FROM THE CLOSING DATE OF BID.

| SCHEDULE A – BASIC UNIT | | |
|--------------------------|--|---|
| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
| 3.13.1. | Multi-Channel Data Logger with integrated level, temperature and conductivity sensors – for permanent submerged deployment with fixed (non-removable) communication cable and vented tube, complete as specified. | |
| 3.13.2. a | Transducer Cable (per sensor) | Normal Cable (per meter) |
| 3.13.2. b | | Strengthened Cable (per meter) |
| 3.13.3. | Interfacing to Data Transmission System (per system) | |
| 3.13.4. | Bi-directional Communication Serial Cable (Data Logger ⇒ Laptop / Tablet or Smartphone) | |
| 3.13.5. | Power Supply Cable, 2m long, Including plug for Logger | |
| 3.13.6. | Lightning and Surge Protection Unit | |
| 3.13.7. | Any other accessories required for complete installation: | |
| | (a) | |
| | (b) | |
| | (c) | |
| | (d) | |
| | (e) | |
| 3.13.8. | Software package required for the operation of the Data Logger | |
| SCHEDULE B – MAINTENANCE | | |
| 3.13.9. | Cost of labour for repair / replacement of: (per hour) <ul style="list-style-type: none"> • Items not covered by the guarantee (Listed in Technical Schedules), or • Items which have become damaged / defective due to causes for which the manufacturer cannot be held responsible | |

| 3.13.10. | Cost of labour for General Maintenance and/or Back-up on Hardware and/or Software: (per hour) | |
|-------------------------------------|--|---------------------|
| 3.13.11. | Training at the two venues: (Include traveling, accommodation and meals) <ul style="list-style-type: none">• North-West Province• Eastern- or Southern Cape | |
| | | |
| | | |
| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
| 3.13.12. | Cost for assistance on installations for the first 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
| | | |
| | | |
| 3.13.13. | Cost for maintenance / assistance on equipment for the second 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
| | | |
| | | |
| 3.13.14. | Cost for maintenance / assistance on equipment for the third 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
| | | |
| | | |
| SCHEDULE B – SPARES | | |
| 3.13.15. | | |
| 3.13.16. | | |
| 3.13.17. | | |
| 3.13.18. | | |
| 3.13.19. | | |
| 3.13.20. | | |
| 3.13.21. | | |
| SCHEDULE C – ADDITIONAL ACCESSORIES | | |
| 3.13.22. | | |
| 3.13.23. | | |

| | | |
|---|--------------------|----------------------------|
| 3.13.24. | | |
| 3.13.25. | | |
| 3.13.26. | | |
| 3.13.27. | | |
| 3.13.28. | | |
| 3.13.29. | | |
| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
| 3.13.30. | | |
| 3.13.31. | | |
| 3.13.32. | | |
| 3.13.33. | | |
| 3.13.34. | | |
| 3.13.35. | | |
| List all items of which the Prices are NOT FIRM, i.e. Effected by Rate of Exchange | | |
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| Applicable Rate of Exchange (On date of Signature) | | |
| = R | | |

BIDDER'S SIGNATURE:
 NAME OF BIDDER / COMPANY:
 DATE:

3.14. PRICE SCHEDULES FOR MULTI-CHANNEL DATA LOGGER WITH INTEGRATED SENSORS: PRESSURE TRANSDUCER (VENTED), TEMPERATURE- AND CONDUCTIVITY SENSOR.

OFFER TO BE VALID FOR **120 DAYS** FROM THE CLOSING DATE OF BID.

| SCHEDULE A – BASIC UNIT | | |
|--------------------------|---|---|
| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
| 3.14.1. | Multi-Channel Data Logger with integrated sensors: pressure transducer (vented), temperature- and conductivity sensor, complete as specified. | |
| 3.14.2. a | Transducer Cable (per sensor) | Normal Cable (per meter) |
| 3.14.2. b | | Strengthened Cable (per meter) |
| 3.14.3. | Interfacing to Data Transmission System (per system) | |
| 3.14.4. | Bi-directional Communication Serial Cable (Data Logger ⇒ Laptop / Tablet or Smartphone) | |
| 3.14.5. | Power Supply Cable, 2m long, Including plug for Logger | |
| 3.14.6. | Lightning and Surge Protection Unit | |
| 3.14.7. | Any other accessories required for complete installation: (a) | |
| | (b) | |
| | (c) | |
| | (d) | |
| | (e) | |
| 3.14.8. | Software package required for the operation of the Data Logger | |
| SCHEDULE B – MAINTENANCE | | |
| 3.14.9. | Cost of labour for repair / replacement of: (per hour) <ul style="list-style-type: none"> Items not covered by the guarantee (Listed in Technical Schedules), or Items which have become damaged / defective due to causes for which the manufacturer cannot be held responsible | |
| 3.14.10. | Cost of labour for General Maintenance and/or Back-up on Hardware and/or Software: (per hour) | |

| 3.14.11. | Training at the two venues: (Include traveling, accommodation and meals) <ul style="list-style-type: none">• North-West Province• Eastern- or Southern Cape | |
|-------------------------------------|--|---------------------|
| | | |
| | | |
| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
| 3.14.12. | Cost for assistance on installations for the first 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
| | | |
| | | |
| 3.14.13. | Cost for maintenance / assistance on equipment for the second 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
| | | |
| | | |
| 3.14.14. | Cost for maintenance / assistance on equipment for the third 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
| | | |
| | | |
| SCHEDULE B – SPARES | | |
| 3.14.15. | | |
| 3.14.16. | | |
| 3.14.17. | | |
| 3.14.18. | | |
| 3.14.19. | | |
| 3.14.20. | | |
| 3.14.21. | | |
| SCHEDULE C – ADDITIONAL ACCESSORIES | | |
| 3.14.22. | | |
| 3.14.23. | | |
| 3.14.24. | | |

| | | |
|---|--------------------|----------------------------|
| 3.14.25. | | |
| 3.14.26. | | |
| 3.14.27. | | |
| 3.14.28. | | |
| 3.14.29. | | |
| 3.14.30. | | |
| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
| 3.14.31. | | |
| 3.14.32. | | |
| 3.14.33. | | |
| 3.14.34. | | |
| 3.14.35. | | |
| 3.14.36. | | |
| List all items of which the Prices are NOT FIRM, i.e. Effected by Rate of Exchange | | |
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| Applicable Rate of Exchange (On date of Signature) | | |
| = R | | |

BIDDER'S SIGNATURE:

NAME OF BIDDER / COMPANY:

DATE:

- 3.15. PRICE SCHEDULES FOR MULTI-CHANNEL DATA LOGGER WITH INTEGRATED SENSORS: PRESSURE TRANSDUCER, TEMPERATURE- AND CONDUCTIVITY SENSOR, WITH BUILT-IN GPS AND BLUETOOTH COMMUNICATION:
OFFER TO BE VALID FOR **120 DAYS** FROM THE CLOSING DATE OF BID.

| SCHEDULE A – BASIC UNIT | | |
|--------------------------|---|---|
| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
| 3.15.1. | Multi-Channel Data Logger with integrated sensors: pressure transducer, temperature- and conductivity sensor, with built-in GPS and Bluetooth communication, complete as specified. | |
| 3.15.2. | Transducer Cable (per sensor) | Normal Cable (per meter) |
| 3.15.2. | | Strengthened Cable (per meter) |
| 3.15.3. | Interfacing to Data Transmission System (per system) | |
| 3.15.4. | Bluetooth Communication (Data Logger ⇒ Laptop / Tablet or Smartphone) | |
| 3.15.5. | Power Supply Cable, 2m long, Including plug for Logger | |
| 3.15.6. | Lightning and Surge Protection Unit | |
| 3.15.7. | Any other accessories required for complete installation: (a) | |
| | (b) | |
| | (c) | |
| | (d) | |
| | (e) | |
| 3.15.8. | Software package required for the operation of the Data Logger | |
| SCHEDULE B – MAINTENANCE | | |
| 3.15.9. | Cost of labour for repair / replacement of: (per hour) <ul style="list-style-type: none"> Items not covered by the guarantee (Listed in Technical Schedules), or Items which have become damaged / defective due to causes for which the manufacturer cannot be held responsible | |
| 3.15.10. | Cost of labour for General Maintenance and/or Back-up on Hardware and/or Software: (per hour) | |

| 3.15.11. | Training at the two venues: (Include traveling, accommodation and meals) <ul style="list-style-type: none">• North-West Province• Eastern- or Southern Cape | |
|-------------------------------------|--|---------------------|
| | | |
| | | |
| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
| 3.15.12. | Cost for assistance on installations for the first 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
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| 3.15.13. | Cost for maintenance / assistance on equipment for the second 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
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| | | |
| 3.15.14. | Cost for maintenance / assistance on equipment for the third 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
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| SCHEDULE B – SPARES | | |
| 3.15.15. | | |
| 3.15.16. | | |
| 3.15.17. | | |
| 3.15.18. | | |
| 3.15.19. | | |
| 3.15.20. | | |
| 3.15.21. | | |
| SCHEDULE C – ADDITIONAL ACCESSORIES | | |
| 3.15.22. | | |
| 3.15.23. | | |
| 3.15.24. | | |

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| 3.15.25. | | |
| 3.15.26. | | |
| 3.15.27. | | |
| 3.15.28. | | |
| 3.15.29. | | |
| 3.15.30. | | |
| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
| 3.15.31. | | |
| 3.15.32. | | |
| 3.15.33. | | |
| 3.15.34. | | |
| 3.15.35. | | |
| 3.15.36. | | |
| List all items of which the Prices are NOT FIRM, i.e. Effected by Rate of Exchange | | |
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| Applicable Rate of Exchange (On date of Signature) | | |
| = R | | |

BIDDER'S SIGNATURE:

NAME OF BIDDER / COMPANY:

DATE:

- 3.16. PRICE SCHEDULES FOR MULTI-CHANNEL DATA LOGGER WITH INTEGRATED SENSORS: PRESSURE TRANSDUCER AND WATER VELOCITY MEASUREMENT FOR USE IN LARGE STREAMS;
OFFER TO BE VALID FOR **120 DAYS** FROM THE CLOSING DATE OF BID.

| SCHEDULE A – BASIC UNIT | | |
|--------------------------|---|---|
| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
| 3.16.1. | Multi-Channel Data Logger with integrated sensors: pressure transducer and water velocity measurement for use in large streams, complete as specified. | |
| 3.16.2. | Transducer Cable (per sensor) | Normal Cable (per meter) |
| 3.16.2. | | Strengthened Cable (per meter) |
| 3.16.3. | Interfacing to Data Transmission System (per system) | |
| 3.16.4. | Bi-directional Communication Serial Cable (Data Logger ⇒ Laptop / Tablet or Smartphone) | |
| 3.16.5. | Power Supply Cable, 2m long, Including plug for Logger | |
| 3.16.6. | Lightning and Surge Protection Unit | |
| 3.16.7. | Any other accessories required for complete installation: (a) | |
| | (b) | |
| | (c) | |
| | (d) | |
| | (e) | |
| 3.16.8. | Software package required for the operation of the Data Logger | |
| SCHEDULE B – MAINTENANCE | | |
| 3.16.9. | Cost of labour for repair / replacement of: (per hour) <ul style="list-style-type: none"> Items not covered by the guarantee (Listed in Technical Schedules), or Items which have become damaged / defective due to causes for which the manufacturer cannot be held responsible | |
| 3.16.10. | Cost of labour for General Maintenance and/or Back-up on Hardware and/or Software: (per hour) | |

| 3.16.11. | Training at the two venues: (Include traveling, accommodation and meals) <ul style="list-style-type: none">• North-West Province• Eastern- or Southern Cape | |
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| | | |
| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
| 3.16.12. | Cost for assistance on installations for the first 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
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| | | |
| 3.16.13. | Cost for maintenance / assistance on equipment for the second 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
| | | |
| | | |
| 3.16.14. | Cost for maintenance / assistance on equipment for the third 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
| | | |
| | | |
| SCHEDULE B – SPARES | | |
| 3.16.15. | | |
| 3.16.16. | | |
| 3.16.17. | | |
| 3.16.18. | | |
| 3.16.19. | | |
| 3.16.20. | | |
| 3.16.21. | | |
| SCHEDULE C – ADDITIONAL ACCESSORIES | | |
| 3.16.22. | | |
| 3.16.23. | | |
| 3.16.24. | | |

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|---|--------------------|----------------------------|
| 3.16.25. | | |
| 3.16.26. | | |
| 3.16.27. | | |
| 3.16.28. | | |
| 3.16.29. | | |
| 3.16.30. | | |
| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
| 3.16.31. | | |
| 3.16.32. | | |
| 3.16.33. | | |
| 3.16.34. | | |
| 3.16.35. | | |
| 3.16.36. | | |
| List all items of which the Prices are NOT FIRM, i.e. Effected by Rate of Exchange | | |
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| Applicable Rate of Exchange (On date of Signature) | | |
| = R | | |

BIDDER'S SIGNATURE:
 NAME OF BIDDER / COMPANY:
 DATE:

3.17. PRICE SCHEDULES FOR MULTI-CHANNEL DATA LOGGER WITH INTEGRATED SENSORS: PRESSURE TRANSDUCER AND WATER VELOCITY MEASUREMENT FOR USE IN MEDIUM STREAMS;
OFFER TO BE VALID FOR **120 DAYS** FROM THE CLOSING DATE OF BID.

| SCHEDULE A – BASIC UNIT | | |
|--------------------------|--|---|
| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
| 3.17.1. | Multi-Channel Data Logger with integrated sensors: pressure transducer and water velocity measurement for use in medium streams, complete as specified. | |
| 3.17.2. | Transducer Cable (per sensor) | Normal Cable (per meter) |
| 3.17.2. | | Strengthened Cable (per meter) |
| 3.17.3. | Interfacing to sensor | |
| 3.17.4. | Interfacing to Data Transmission System (per system) | |
| 3.17.5. | Bi-directional Communication Serial Cable (Data Logger ⇒ Laptop / Tablet or Smartphone) | |
| 3.17.6. | Power Supply Cable, 2m long, Including plug for Logger | |
| 3.17.7. | Lightning and Surge Protection Unit | |
| 3.17.8. | Any other accessories required for complete installation: (a) | |
| | (b) | |
| | (c) | |
| | (d) | |
| | (e) | |
| 3.17.9. | Software package required for the operation of the Data Logger | |
| SCHEDULE B – MAINTENANCE | | |
| 3.17.10. | Cost of labour for repair / replacement of: (per hour) <ul style="list-style-type: none"> • Items not covered by the guarantee (Listed in Technical Schedules), or • Items which have become damaged / defective due to causes for which the manufacturer cannot be held responsible | |

| 3.17.11. | Cost of labour for General Maintenance and/or Back-up on Hardware and/or Software: (per hour) | |
|-------------------------------------|--|---------------------|
| 3.17.12. | Training at the two venues: (Include traveling, accommodation and meals) <ul style="list-style-type: none">• North-West Province• Eastern- or Southern Cape | |
| | | |
| | | |
| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
| 3.17.13. | Cost for assistance on installations for the first 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
| | | |
| | | |
| 3.17.14. | Cost for maintenance / assistance on equipment for the second 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
| | | |
| | | |
| 3.17.15. | Cost for maintenance / assistance on equipment for the third 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
| | | |
| | | |
| SCHEDULE B – SPARES | | |
| 3.17.16. | | |
| 3.17.17. | | |
| 3.17.18. | | |
| 3.17.19. | | |
| 3.17.20. | | |
| 3.17.21. | | |
| 3.17.22. | | |
| SCHEDULE C – ADDITIONAL ACCESSORIES | | |
| 3.17.23. | | |
| 3.17.24. | | |

| 3.17.25. | | |
|---|-------------|---------------------|
| 3.17.26. | | |
| 3.17.27. | | |
| 3.17.28. | | |
| 3.17.29. | | |
| 3.17.30. | | |
| 3.17.31. | | |
| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
| 3.17.32. | | |
| 3.17.33. | | |
| 3.17.34. | | |
| 3.17.35. | | |
| 3.17.36. | | |
| 3.17.37. | | |
| List all items of which the Prices are NOT FIRM, i.e. Effected by Rate of Exchange | | |
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| | | |
| Applicable Rate of Exchange (On date of Signature) | | |
| = R | | |

BIDDER'S SIGNATURE:

NAME OF BIDDER / COMPANY:

DATE:

3.18. PRICE SCHEDULES FOR MULTI-CHANNEL DATA LOGGER WITH INTEGRATED SENSORS: PRESSURE TRANSDUCER AND WATER VELOCITY MEASUREMENT FOR USE IN SMALL STREAMS;
OFFER TO BE VALID FOR **120 DAYS** FROM THE CLOSING DATE OF BID.

| SCHEDULE A – BASIC UNIT | | |
|--------------------------|--|---|
| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
| 3.18.1. | Multi-Channel Data Logger with integrated sensors: pressure transducer and water velocity measurement for use in small streams, complete as specified. | |
| 3.18.2. | Transducer Cable (per sensor) | Normal Cable (per meter) |
| 3.18.2. | | Strengthened Cable (per meter) |
| 3.18.3. | Interfacing to sensor | |
| 3.18.4. | Interfacing to Data Transmission System (per system) | |
| 3.18.5. | Bi-directional Communication Serial Cable (Data Logger ⇒ Laptop / Tablet or Smartphone) | |
| 3.18.6. | Power Supply Cable, 2m long, Including plug for Logger | |
| 3.18.7. | Lightning and Surge Protection Unit | |
| 3.18.8. | Any other accessories required for complete installation: (a) | |
| | (b) | |
| | (c) | |
| | (d) | |
| | (e) | |
| 3.18.9. | Software package required for the operation of the Data Logger | |
| SCHEDULE B – MAINTENANCE | | |
| 3.18.10. | Cost of labour for repair / replacement of: (per hour) <ul style="list-style-type: none"> • Items not covered by the guarantee (Listed in Technical Schedules), or • Items which have become damaged / defective due to causes for which the manufacturer cannot be held responsible | |

| 3.18.11. | Cost of labour for General Maintenance and/or Back-up on Hardware and/or Software: (per hour) | |
|-------------------------------------|--|---------------------|
| 3.18.12. | Training at the two venues: (Include traveling, accommodation and meals) <ul style="list-style-type: none">• North-West Province• Eastern- or Southern Cape | |
| | | |
| | | |
| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
| 3.18.13. | Cost for assistance on installations for the first 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
| | | |
| | | |
| 3.18.14. | Cost for maintenance / assistance on equipment for the second 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
| | | |
| | | |
| 3.18.15. | Cost for maintenance / assistance on equipment for the third 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
| | | |
| | | |
| SCHEDULE B – SPARES | | |
| 3.18.16. | | |
| 3.18.17. | | |
| 3.18.18. | | |
| 3.18.19. | | |
| 3.18.20. | | |
| 3.18.21. | | |
| 3.18.22. | | |
| SCHEDULE C – ADDITIONAL ACCESSORIES | | |
| 3.18.23. | | |
| 3.18.24. | | |

| 3.18.25. | | |
|---|-------------|---------------------|
| 3.18.26. | | |
| 3.18.27. | | |
| 3.18.28. | | |
| 3.18.29. | | |
| 3.18.30. | | |
| 3.18.31. | | |
| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
| 3.18.32. | | |
| 3.18.33. | | |
| 3.18.34. | | |
| 3.18.35. | | |
| 3.18.36. | | |
| 3.18.37. | | |
| List all items of which the Prices are NOT FIRM, i.e. Effected by Rate of Exchange | | |
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| Applicable Rate of Exchange (On date of Signature) | | |
| = R | | |

BIDDER'S SIGNATURE:

NAME OF BIDDER / COMPANY:

DATE:

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3.19. PRICE SCHEDULES FOR MULTI-CHANNEL DATA LOGGER WITH INTEGRATED SENSORS: PRESSURE TRANSDUCER AND WATER VELOCITY MEASUREMENT FOR USE IN SHALLOW STREAMS;
OFFER TO BE VALID FOR **120 DAYS** FROM THE CLOSING DATE OF BID.

| SCHEDULE A – BASIC UNIT | | |
|--------------------------|--|---|
| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
| 3.19.1. | Multi-Channel Data Logger with integrated sensors: pressure transducer and water velocity measurement for use in shallow streams, complete as specified. | |
| 3.19.2. | Transducer Cable (per sensor) | Normal Cable (per meter) |
| 3.19.2. | | Strengthened Cable (per meter) |
| 3.19.3. | Interfacing to sensor | |
| 3.19.4. | Interfacing to Data Transmission System (per system) | |
| 3.19.5. | Bi-directional Communication Serial Cable (Data Logger ⇒ Laptop / Tablet or Smartphone) | |
| 3.19.6. | Power Supply Cable, 2m long, Including plug for Logger | |
| 3.19.7. | Lightning and Surge Protection Unit | |
| 3.19.8. | Any other accessories required for complete installation: (a) | |
| | (b) | |
| | (c) | |
| | (d) | |
| | (e) | |
| 3.19.9. | Software package required for the operation of the Data Logger | |
| SCHEDULE B – MAINTENANCE | | |
| 3.19.10. | Cost of labour for repair / replacement of: (per hour) <ul style="list-style-type: none"> Items not covered by the guarantee (Listed in Technical Schedules), or Items which have become damaged / defective due to causes for which the manufacturer cannot be held responsible | |

| 3.19.11. | Cost of labour for General Maintenance and/or Back-up on Hardware and/or Software: (per hour) | |
|-------------------------------------|--|---------------------|
| 3.19.12. | Training at the two venues: (Include traveling, accommodation and meals) <ul style="list-style-type: none">• North-West Province• Eastern- or Southern Cape | |
| | | |
| | | |
| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
| 3.19.13. | Cost for assistance on installations for the first 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
| | | |
| | | |
| 3.19.14. | Cost for maintenance / assistance on equipment for the second 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
| | | |
| | | |
| 3.19.15. | Cost for maintenance / assistance on equipment for the third 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
| | | |
| | | |
| SCHEDULE B – SPARES | | |
| 3.19.16. | | |
| 3.19.17. | | |
| 3.19.18. | | |
| 3.19.19. | | |
| 3.19.20. | | |
| 3.19.21. | | |
| 3.19.22. | | |
| SCHEDULE C – ADDITIONAL ACCESSORIES | | |
| 3.19.23. | | |
| 3.19.24. | | |

| 3.19.25. | | |
|--|-------------|---------------------|
| 3.19.26. | | |
| 3.19.27. | | |
| 3.19.28. | | |
| 3.19.29. | | |
| 3.19.30. | | |
| 3.19.31. | | |
| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
| 3.19.32. | | |
| 3.19.33. | | |
| 3.19.34. | | |
| 3.19.35. | | |
| 3.19.36. | | |
| 3.19.37. | | |
| List all items of which the Prices are NOT FIRM, i.e. Effected by Rate of Exchange | | |
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| | | |
| Applicable Rate of Exchange (On date of Signature) | | |
| = R | | |

BIDDER'S SIGNATURE:

NAME OF BIDDER / COMPANY:

DATE:

3.20. PRICE SCHEDULES FOR MULTI-CHANNEL DATA LOGGER WITH INTEGRATED SENSORS: WEATHER PARAMETERS;
OFFER TO BE VALID FOR **120 DAYS** FROM THE CLOSING DATE OF BID.

| SCHEDULE A – BASIC UNIT | | |
|--------------------------|---|---|
| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
| 3.20.1. | Multi-Channel Data Logger with integrated sensors: weather parameters, complete as specified. | |
| 3.20.2. | Transducer Cable (per sensor) | Normal Cable (per meter) |
| 3.20.2. | | Strengthened Cable (per meter) |
| 3.20.3. | Interfacing to sensors | |
| 3.20.4. | Interfacing to Data Transmission System (per system) | |
| 3.20.5. | Bi-directional Communication Serial Cable (Data Logger ⇒ Laptop / Tablet or Smartphone) | |
| 3.20.6. | Power Supply Cable, 2m long, Including plug for Logger | |
| 3.20.7. | Lightning and Surge Protection Unit | |
| 3.20.8. | Any other accessories required for complete installation: (a) | |
| | (b) | |
| | (c) | |
| | (d) | |
| | (e) | |
| 3.20.9. | Software package required for the operation of the Data Logger | |
| SCHEDULE B – MAINTENANCE | | |
| 3.20.10. | Cost of labour for repair / replacement of: (per hour) <ul style="list-style-type: none"> Items not covered by the guarantee (Listed in Technical Schedules), or Items which have become damaged / defective due to causes for which the manufacturer cannot be held responsible | |
| 3.20.11. | Cost of labour for General Maintenance and/or Back-up on Hardware and/or Software: (per hour) | |

| 3.20.12. | Training at the two venues: (Include traveling, accommodation and meals) <ul style="list-style-type: none">• North-West Province• Eastern- or Southern Cape | |
|-------------------------------------|--|---------------------|
| | | |
| | | |
| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
| 3.20.13. | Cost for assistance on installations for the first 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
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| | | |
| 3.20.14. | Cost for maintenance / assistance on equipment for the second 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
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| | | |
| 3.20.15. | Cost for maintenance / assistance on equipment for the third 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
| | | |
| | | |
| SCHEDULE B – SPARES | | |
| 3.20.16. | | |
| 3.20.17. | | |
| 3.20.18. | | |
| 3.20.19. | | |
| 3.20.20. | | |
| 3.20.21. | | |
| 3.20.22. | | |
| SCHEDULE C – ADDITIONAL ACCESSORIES | | |
| 3.20.23. | | |
| 3.20.24. | | |
| 3.20.25. | | |

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|---|--------------------|----------------------------|
| 3.20.26. | | |
| 3.20.27. | | |
| 3.20.28. | | |
| 3.20.29. | | |
| 3.20.30. | | |
| 3.20.31. | | |
| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
| 3.20.32. | | |
| 3.20.33. | | |
| 3.20.34. | | |
| 3.20.35. | | |
| 3.20.36. | | |
| 3.20.37. | | |
| List all items of which the Prices are NOT FIRM, i.e. Effected by Rate of Exchange | | |
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| Applicable Rate of Exchange (On date of Signature) | | |
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BIDDER'S SIGNATURE:

NAME OF BIDDER / COMPANY:

DATE:

- 3.21. PRICE SCHEDULES FOR MULTI-CHANNEL DATA LOGGER FOR EXTERNAL SENSORS: 4-20 MA (VENTED PRESSURE TRANSDUCER) AND DIGITAL PULSE (RAINFALL); SUBMERSIBLE WITH INTERNAL BATTERY AND INTERNAL GSM MODEM; OFFER TO BE VALID FOR **120 DAYS** FROM THE CLOSING DATE OF BID.

| SCHEDULE A – BASIC UNIT | | |
|--------------------------|--|--|
| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
| 3.21.1. | Multi-Channel Data Logger for external sensors: 4-20 mA (vented pressure transducer) and digital pulse (rainfall); submersible with internal battery and internal GSM modem, complete as specified. | |
| 3.21.2. | Interfacing to sensors | 3 – 20 mA (vented pressure transducer) |
| 3.21.2. | | Digital pulse (rainfall) |
| 3.21.3. | External power input connection terminal | |
| 3.21.4. | Power supply cable, 2m long, including plug for logger | |
| 3.21.5. | Interfacing to Data Transmission System (per system) | |
| 3.21.6. | External GSM antenna connection, SMA type | |
| 3.21.7. | Bi-directional Communication Serial Cable (Data Logger ⇒ Laptop / Tablet or Smartphone) | |
| 3.21.8. | Lightning and Surge Protection Unit | |
| 3.21.9. | Any other accessories required for complete installation: | |
| | (a) | |
| | (b) | |
| | (c) | |
| 3.21.9. | (d) | |
| | | |
| 3.21.10. | Software package required for the operation of the Data Logger | |
| SCHEDULE B – MAINTENANCE | | |
| 3.21.11. | Cost of labour for repair / replacement of: (per hour) <ul style="list-style-type: none"> Items not covered by the guarantee (Listed in Technical Schedules), or Items which have become damaged / defective due to causes for which the manufacturer cannot be held responsible | |

| 3.21.12. | Cost of labour for General Maintenance and/or Back-up on Hardware and/or Software: (per hour) | |
|-------------------------------------|--|---------------------|
| 3.21.13. | Training at the two venues: (Include traveling, accommodation and meals) <ul style="list-style-type: none">• North-West Province• Eastern- or Southern Cape | |
| | | |
| | | |
| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
| 3.21.14. | Cost for assistance on installations for the first 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
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| 3.21.15. | Cost for maintenance / assistance on equipment for the second 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
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| 3.21.16. | Cost for maintenance / assistance on equipment for the third 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
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| SCHEDULE B – SPARES | | |
| 3.21.17. | | |
| 3.21.18. | | |
| 3.21.19. | | |
| 3.21.20. | | |
| 3.21.21. | | |
| 3.21.22. | | |
| 3.21.23. | | |
| SCHEDULE C – ADDITIONAL ACCESSORIES | | |
| 3.21.24. | | |

| 3.21.25. | | |
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| 3.21.26. | | |
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| 3.21.30. | | |
| 3.21.31. | | |
| 3.21.32. | | |
| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
| 3.21.33. | | |
| 3.21.34. | | |
| 3.21.35. | | |
| 3.21.36. | | |
| 3.21.37. | | |
| 3.21.38. | | |
| List all items of which the Prices are NOT FIRM, i.e. Effected by Rate of Exchange | | |
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| Applicable Rate of Exchange (On date of Signature) | | |
| = R | | |

BIDDER'S SIGNATURE:

NAME OF BIDDER / COMPANY:

DATE:

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3.22. PRICE SCHEDULES FOR MULTI-CHANNEL DATA LOGGER FOR EXTERNAL SENSORS: MULTIPLE; WITH DATA TRANSMISSION CAPABILITIES.
OFFER TO BE VALID FOR **120 DAYS** FROM THE CLOSING DATE OF BID.

| SCHEDULE A – BASIC UNIT | | |
|--------------------------|--|---------------------|
| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
| 3.22.1. | Multi-Channel Data Logger for external sensors: multiple; with data transmission capabilities, complete as specified. | |
| 3.22.2. | Interfacing to each sensor (per sensor) | |
| 3.22.3. | External power input connection terminal | |
| 3.22.4. | Power supply cable, 2m long, including plug for logger | |
| 3.22.5. | Interfacing to Data Transmission System (per system) | |
| 3.22.6. | External GSM- or Satellite antenna with 3,0 m Coaxial Cable, Connectors and Mounting | |
| 3.22.7. | Bi-directional Communication Serial Cable (Data Logger ⇒ Laptop / Tablet or Smartphone) | |
| 3.22.8. | Lightning and Surge Protection Unit | |
| 3.22.9. | Any other accessories required for complete installation: | |
| | (a) | |
| | (b) | |
| | (c) | |
| | (d) | |
| | (e) | |
| 3.22.10. | Software package required for the operation of the Data Logger | |
| SCHEDULE B – MAINTENANCE | | |
| 3.22.11. | Cost of labour for repair / replacement of: (per hour) <ul style="list-style-type: none"> Items not covered by the guarantee (Listed in Technical Schedules), or Items which have become damaged / defective due to causes for which the manufacturer cannot be held responsible | |
| 3.22.12. | Cost of labour for General Maintenance and/or Back-up on Hardware and/or Software: (per hour) | |

| 3.22.13. | Training at the two venues: (Include traveling, accommodation and meals) <ul style="list-style-type: none">• North-West Province• Eastern- or Southern Cape | |
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| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
| 3.22.14. | Cost for assistance on installations for the first 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
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| | | |
| 3.22.15. | Cost for maintenance / assistance on equipment for the second 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
| | | |
| | | |
| 3.22.16. | Cost for maintenance / assistance on equipment for the third 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
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| | | |
| SCHEDULE B – SPARES | | |
| 3.22.17. | | |
| 3.22.18. | | |
| 3.22.19. | | |
| 3.22.20. | | |
| 3.22.21. | | |
| 3.22.22. | | |
| 3.22.23. | | |
| SCHEDULE C – ADDITIONAL ACCESSORIES | | |
| 3.22.24. | | |
| 3.22.25. | | |
| 3.22.26. | | |

| | | |
|---|--------------------|----------------------------|
| 3.22.27. | | |
| 3.22.28. | | |
| 3.22.29. | | |
| 3.22.30. | | |
| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
| 3.22.31. | | |
| 3.22.32. | | |
| 3.22.33. | | |
| 3.22.34. | | |
| 3.22.35. | | |
| 3.22.36. | | |
| List all items of which the Prices are NOT FIRM, i.e. Effected by Rate of Exchange | | |
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| Applicable Rate of Exchange (On date of Signature) | | |
| = R | | |

BIDDER'S SIGNATURE:

NAME OF BIDDER / COMPANY:

DATE:

INTEGRATED DATA LOGGER WITH REMOVABLE WATER QUALITY SENSORS

- 5.1. PRICE SCHEDULES FOR MULTI-PARAMETER WATER QUALITY SONDE WITH PH-, ELECTRICAL CONDUCTIVITY-, TEMPERATURE-, DEPTH AND OPTICAL OXYGEN SENSORS (BLUETOOTH COMMUNICATION CAPABILITY) – DIAMETER LESS THAN FIVE CENTIMETRES; OFFER TO BE VALID FOR **120 DAYS** FROM THE CLOSING DATE OF BID.

| SCHEDULE A – BASIC UNIT | | |
|--------------------------|--|---------------------|
| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
| 5.1.1. | Multi- parameter water quality sonde with pH-, electrical conductivity-, temperature-, depth and optical oxygen sensors (Bluetooth communication capability) – diameter less than five centimetres, complete as specified. | |
| 5.1.2. | Bluetooth Communication (Data Logger ⇒ Laptop / Tablet or Smartphone) | |
| 5.1.3. | Any other accessories required for complete installation: | |
| | (a) | |
| | (b) | |
| | (c) | |
| | (d) | |
| | (e) | |
| 5.1.4. | Software package required for the operation of the Data Logger | |
| SCHEDULE B – MAINTENANCE | | |
| 5.1.5. | Cost of labour for repair / replacement of: (per hour) <ul style="list-style-type: none"> Items not covered by the guarantee (Listed in Technical Schedules), or Items which have become damaged / defective due to causes for which the manufacturer cannot be held responsible | |
| 5.1.6. | Cost of labour for General Maintenance and/or Back-up on Hardware and/or Software: (per hour) | |
| 5.1.7. | Training at the two venues: (Include traveling, accommodation and meals) | |
| | <ul style="list-style-type: none"> North-West Province | |
| | <ul style="list-style-type: none"> Eastern- or Southern Cape | |

| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
|-------------------------------------|--|---------------------|
| 5.1.8. | Cost for assistance on installations for the first 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
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| | | |
| 5.1.9. | Cost for maintenance / assistance on equipment for the second 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
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| | | |
| 5.1.10. | Cost for maintenance / assistance on equipment for the third 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
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| | | |
| SCHEDULE B – SPARES | | |
| 5.1.11. | | |
| 5.1.12. | | |
| 5.1.13. | | |
| 5.1.14. | | |
| 5.1.15. | | |
| 5.1.16. | | |
| 5.1.17. | | |
| SCHEDULE C – ADDITIONAL ACCESSORIES | | |
| 5.1.18. | | |
| 5.1.19. | | |
| 5.1.20. | | |
| 5.1.21. | | |
| 5.1.22. | | |
| 5.1.23. | | |

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|---|--------------------|----------------------------|
| 5.1.24. | | |
| 5.1.25. | | |
| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
| 5.1.26. | | |
| 5.1.27. | | |
| 5.1.28. | | |
| 5.1.29. | | |
| 5.1.30. | | |
| 5.1.31. | | |
| List all items of which the Prices are NOT FIRM, i.e. Effected by Rate of Exchange | | |
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| Applicable Rate of Exchange (On date of Signature) | | |
| = R | | |

BIDDER’S SIGNATURE:

NAME OF BIDDER / COMPANY:

DATE:

- 5.2. PRICE SCHEDULES FOR DEEP WATER (MINIMUM 245M) MULTI-PARAMETER WATER QUALITY SONDE WITH OPTICAL AND SMART SENSOR TECHNOLOGY - DIAMETER LESS THAN FIVE CENTIMETRES;
OFFER TO BE VALID FOR **120 DAYS** FROM THE CLOSING DATE OF BID.

| SCHEDULE A – BASIC UNIT | | |
|--------------------------|--|---------------------|
| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
| 5.2.1. | Deep water (minimum 245 m) multi-parameter water quality sonde with optical and smart sensor technology - diameter less than five centimetres, complete as specified. | |
| 5.2.2. | Bi-directional Communication Serial Cable (Data Logger ⇒ Laptop / Tablet or Smartphone) | |
| 5.2.3. | Any other accessories required for complete installation: | |
| | (a) | |
| | (b) | |
| | (c) | |
| | (d) | |
| | (e) | |
| 5.2.4. | Software package required for the operation of the Data Logger | |
| SCHEDULE B – MAINTENANCE | | |
| 5.2.5. | Cost of labour for repair / replacement of: (per hour) <ul style="list-style-type: none"> Items not covered by the guarantee (Listed in Technical Schedules), or Items which have become damaged / defective due to causes for which the manufacturer cannot be held responsible | |
| 5.2.6. | Cost of labour for General Maintenance and/or Back-up on Hardware and/or Software: (per hour) | |
| 5.2.7. | Training at the two venues: (Include traveling, accommodation and meals) | |
| | <ul style="list-style-type: none"> North-West Province | |
| | <ul style="list-style-type: none"> Eastern- or Southern Cape | |

| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
|-------------------------------------|--|---------------------|
| 5.2.8. | Cost for assistance on installations for the first 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
| | | |
| | | |
| 5.2.9. | Cost for maintenance / assistance on equipment for the second 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
| | | |
| | | |
| 5.2.10. | Cost for maintenance / assistance on equipment for the third 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
| | | |
| | | |
| SCHEDULE B – SPARES | | |
| 5.2.11. | | |
| 5.2.12. | | |
| 5.2.13. | | |
| 5.2.14. | | |
| 5.2.15. | | |
| 5.2.16. | | |
| 5.2.17. | | |
| SCHEDULE C – ADDITIONAL ACCESSORIES | | |
| 5.2.18. | | |
| 5.2.19. | | |
| 5.2.20. | | |
| 5.2.21. | | |
| 5.2.22. | | |
| 5.2.23. | | |
| 5.2.24. | | |

| | | |
|---|--------------------|----------------------------|
| 5.2.25. | | |
| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
| 5.2.26. | | |
| 5.2.27. | | |
| 5.2.28. | | |
| 5.2.29. | | |
| 5.2.30. | | |
| 5.2.31. | | |
| List all items of which the Prices are NOT FIRM, i.e. Effected by Rate of Exchange | | |
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| Applicable Rate of Exchange (On date of Signature) | | |
| = R | | |

BIDDER'S SIGNATURE:

NAME OF BIDDER / COMPANY:

DATE:

- 5.3. PRICE SCHEDULES FOR DEEP WATER (MINIMUM 245M) MULTI-PARAMETER WATER QUALITY SONDE WITH OPTICAL AND SMART SENSOR TECHNOLOGY - DIAMETER LESS THAN NINE CENTIMETRES;
OFFER TO BE VALID FOR **120 DAYS** FROM THE CLOSING DATE OF BID.

| SCHEDULE A – BASIC UNIT | | |
|--------------------------|--|---------------------|
| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
| 5.3.1. | Deep water (minimum 245 m) multi-parameter water quality sonde with optical and smart sensor technology - diameter less than nine centimetres, complete as specified. | |
| 5.3.2. | Bi-directional Communication Serial Cable (Data Logger ⇒ Laptop / Tablet or Smartphone) | |
| 5.3.3. | Any other accessories required for complete installation: | |
| | (a) | |
| | (b) | |
| | (c) | |
| | (d) | |
| | (e) | |
| 5.3.4. | Software package required for the operation of the Data Logger | |
| SCHEDULE B – MAINTENANCE | | |
| 5.3.5. | Cost of labour for repair / replacement of: (per hour) <ul style="list-style-type: none"> Items not covered by the guarantee (Listed in Technical Schedules), or Items which have become damaged / defective due to causes for which the manufacturer cannot be held responsible | |
| 5.3.6. | Cost of labour for General Maintenance and/or Back-up on Hardware and/or Software: (per hour) | |
| 5.3.7. | Training at the two venues: (Include traveling, accommodation and meals) | |
| | <ul style="list-style-type: none"> North-West Province | |
| | <ul style="list-style-type: none"> Eastern- or Southern Cape | |

| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
|-------------------------------------|--|---------------------|
| 5.3.8. | Cost for assistance on installations for the first 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
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| | | |
| 5.3.9. | Cost for maintenance / assistance on equipment for the second 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
| | | |
| | | |
| 5.3.10. | Cost for maintenance / assistance on equipment for the third 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
| | | |
| | | |
| SCHEDULE B – SPARES | | |
| 5.3.11. | | |
| 5.3.12. | | |
| 5.3.13. | | |
| 5.3.14. | | |
| 5.3.15. | | |
| 5.3.16. | | |
| 5.3.17. | | |
| SCHEDULE C – ADDITIONAL ACCESSORIES | | |
| 5.3.18. | | |
| 5.3.19. | | |
| 5.3.20. | | |
| 5.3.21. | | |
| 5.3.22. | | |
| 5.3.23. | | |
| 5.3.24. | | |

| | | |
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| 5.3.25. | | |
| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
| 5.3.26. | | |
| 5.3.27. | | |
| 5.3.28. | | |
| 5.3.29. | | |
| 5.3.30. | | |
| 5.3.31. | | |
| List all items of which the Prices are NOT FIRM, i.e. Effected by Rate of Exchange | | |
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| Applicable Rate of Exchange (On date of Signature) | | |
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BIDDER'S SIGNATURE:

NAME OF BIDDER / COMPANY:

DATE:

4. HANDHELD WATER QUALITY DEVICES

5.1. PRICE SCHEDULES FOR MULTI-PARAMETER HANDHELD WATER QUALITY SYSTEM (WITH PH-, DISSOLVED OXYGEN-, ELECTRICAL CONDUCTIVITY- AND TEMPERATURE SENSOR)

OFFER TO BE VALID FOR **120 DAYS** FROM THE CLOSING DATE OF BID.

| SCHEDULE A – BASIC UNIT | | |
|--------------------------|--|-----------------------------------|
| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
| 5.1.1. | Multi-parameter handheld water quality system (with pH-, dissolved oxygen-, electrical conductivity- and temperature sensor), complete as specified. | |
| 5.1.2. | Instrument Cable: 10 m standard: | Normal cable (per 10 m) |
| 5.1.3. | Instrument Cable more than 10 m up to 30m: | Normal cable (per meter) |
| 5.1.4. | Bi-directional Communication Serial Cable (Data Logger ⇒ Laptop / Tablet or Smartphone) | |
| 5.1.5. | Any other accessories required for complete installation: | |
| | (a) | |
| | (b) | |
| | (c) | |
| | (d) | |
| | (e) | |
| 5.1.6. | Software package required for the operation of the Data Logger | |
| SCHEDULE B – MAINTENANCE | | |
| 5.1.7. | Cost of labour for repair / replacement of: (per hour) <ul style="list-style-type: none"> Items not covered by the guarantee (Listed in Technical Schedules), or Items which have become damaged / defective due to causes for which the manufacturer cannot be held responsible | |
| 5.1.8. | Cost of labour for General Maintenance and/or Back-up on Hardware and/or Software: (per hour) | |
| 5.1.9. | Training at the two venues: (Include traveling, accommodation and meals) <ul style="list-style-type: none"> North-West Province | |

| | <ul style="list-style-type: none">• Eastern- or Southern Cape | |
|-------------------------------------|--|---------------------|
| | | |
| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
| 5.1.10. | Cost for assistance on installations for the first 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
| | | |
| | | |
| 5.1.11. | Cost for maintenance / assistance on equipment for the second 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
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| | | |
| 5.1.12. | Cost for maintenance / assistance on equipment for the third 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
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| | | |
| SCHEDULE B – SPARES | | |
| 5.1.13. | | |
| 5.1.14. | | |
| 5.1.15. | | |
| 5.1.16. | | |
| 5.1.17. | | |
| 5.1.18. | | |
| 5.1.19. | | |
| SCHEDULE C – ADDITIONAL ACCESSORIES | | |
| 5.1.20. | | |
| 5.1.21. | | |
| 5.1.22. | | |
| 5.1.23. | | |
| 5.1.24. | | |

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|---|--------------------|----------------------------|
| 5.1.25. | | |
| 5.1.26. | | |
| 5.1.27. | | |
| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
| 5.1.28. | | |
| 5.1.29. | | |
| 5.1.30. | | |
| 5.1.31. | | |
| 5.1.32. | | |
| 5.1.33. | | |
| List all items of which the Prices are NOT FIRM, i.e. Effected by Rate of Exchange | | |
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| | | |
| Applicable Rate of Exchange (On date of Signature) | | |
| = R | | |

BIDDER'S SIGNATURE:

NAME OF BIDDER / COMPANY:

DATE:

5.2. PRICE SCHEDULES FOR MULTI-PARAMETER HANDHELD WATER QUALITY SYSTEM (WITH PH-, DISSOLVED OXYGEN-, ELECTRICAL CONDUCTIVITY- AND TEMPERATURE SENSOR) WITH WIRELESS SMART DEVICE DISPLAY CAPABILITY OFFER TO BE VALID FOR **120 DAYS** FROM THE CLOSING DATE OF BID.

| SCHEDULE A – BASIC UNIT | | |
|--------------------------|--|------------------------------------|
| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
| 5.2.1. | Multi-parameter handheld water quality system (with pH-, dissolved oxygen-, electrical conductivity- and temperature sensor) with wireless smart device display capability, complete as specified. | |
| 5.2.2. a | Instrument Cable: 8-10 m standard: | Normal cable (per 8-10 m) |
| 5.2.3. b | Instrument Cable: more than 8-10 m up to 70m: | Normal cable (per meter) |
| 5.2.4. | Bluetooth Communication (Data Logger ⇒ Laptop / Tablet or Smartphone) | |
| 5.2.5. | Any other accessories required for complete installation: | |
| | (a) | |
| | (b) | |
| | (c) | |
| | (d) | |
| | (e) | |
| 5.2.6. | Software package required for the operation of the Data Logger | |
| SCHEDULE B – MAINTENANCE | | |
| 5.2.7. | Cost of labour for repair / replacement of: (per hour) <ul style="list-style-type: none"> Items not covered by the guarantee (Listed in Technical Schedules), or Items which have become damaged / defective due to causes for which the manufacturer cannot be held responsible | |
| 5.2.8. | Cost of labour for General Maintenance and/or Back-up on Hardware and/or Software: (per hour) | |
| 5.2.9. | Training at the two venues: (Include traveling, accommodation and meals) <ul style="list-style-type: none"> North-West Province | |
| | <ul style="list-style-type: none"> Eastern- or Southern Cape | |

| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
|-------------------------------------|--|---------------------|
| 5.2.10. | Cost for assistance on installations for the first 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
| | | |
| | | |
| 5.2.11. | Cost for maintenance / assistance on equipment for the second 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
| | | |
| | | |
| 5.2.12. | Cost for maintenance / assistance on equipment for the third 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
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| | | |
| SCHEDULE B – SPARES | | |
| 5.2.13. | | |
| 5.2.14. | | |
| 5.2.15. | | |
| 5.2.16. | | |
| 5.2.17. | | |
| 5.2.18. | | |
| 5.2.19. | | |
| SCHEDULE C – ADDITIONAL ACCESSORIES | | |
| 5.2.20. | | |
| 5.2.21. | | |
| 5.2.22. | | |
| 5.2.23. | | |
| 5.2.24. | | |
| 5.2.25. | | |

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|---|--------------------|----------------------------|
| 5.2.26. | | |
| 5.2.27. | | |
| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
| 5.2.28. | | |
| 5.2.29. | | |
| 5.2.30. | | |
| 5.2.31. | | |
| 5.2.32. | | |
| 5.2.33. | | |
| List all items of which the Prices are NOT FIRM, i.e. Effected by Rate of Exchange | | |
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| Applicable Rate of Exchange (On date of Signature) | | |
| = R | | |

BIDDER’S SIGNATURE:

NAME OF BIDDER / COMPANY:

DATE:

6. SENSORS

6.1. PRICE SCHEDULES FOR SENSOR FOR WATER LEVEL MEASUREMENT: SHAFT ENCODER.OFFER TO BE VALID FOR **120 DAYS** FROM THE CLOSING DATE OF BID.

| SCHEDULE A – BASIC UNIT | | |
|--------------------------|--|---|
| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
| 6.1.1. | Shaft encoder, complete as specified. | |
| 6.1.2. a | Data Cable (sensor) | Normal Cable (per meter) |
| 6.1.2. b | | Strengthened Cable (per meter) |
| 6.1.3. | Interfacing to logger | |
| 6.1.4. | Any other accessories required for complete installation: | |
| 6.1.5. | (a) | |
| | (b) | |
| | (c) | |
| | (d) | |
| | (e) | |
| SCHEDULE B – MAINTENANCE | | |
| 6.1.6. | Cost of labour for repair / replacement of: (per hour) <ul style="list-style-type: none"> Items not covered by the guarantee (Listed in Technical Schedules), or Items which have become damaged / defective due to causes for which the manufacturer cannot be held responsible | |
| 6.1.7. | Cost of labour for General Maintenance and/or Back-up on Hardware and/or Software: (per hour) | |
| 6.1.8. | Training at the two venues: (Include traveling, accommodation and meals) <ul style="list-style-type: none"> North-West Province Eastern- or Southern Cape | |
| | | |
| | | |

| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
|-------------------------------------|--|---------------------|
| 6.1.9. | Cost for assistance on installations for the first 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
| | | |
| | | |
| 6.1.10. | Cost for maintenance / assistance on equipment for the second 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
| | | |
| | | |
| 6.1.11. | Cost for maintenance / assistance on equipment for the third 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
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| | | |
| SCHEDULE B – SPARES | | |
| 6.1.12. | | |
| 6.1.13. | | |
| 6.1.14. | | |
| 6.1.15. | | |
| 6.1.16. | | |
| 6.1.17. | | |
| 6.1.18. | | |
| SCHEDULE C – ADDITIONAL ACCESSORIES | | |
| 6.1.19. | | |
| 6.1.20. | | |
| 6.1.21. | | |
| 6.1.22. | | |
| 6.1.23. | | |
| 6.1.24. | | |
| 6.1.25. | | |

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| 6.1.26. | | | |
| List all items of which the Prices are NOT FIRM, i.e. Effected by Rate of Exchange | | | |
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| | | | |
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| Applicable Rate of Exchange (On date of Signature) | | | |
| = R | | | |

BIDDER’S SIGNATURE:

NAME OF BIDDER / COMPANY:

DATE:

- 6.2. PRICE SCHEDULES FOR SENSOR FOR WATER LEVEL MEASUREMENT:
PRESSURE TRANSDUCER: PIEZO RESISTIVE SENSOR (STAINLESS STEEL) WITH
4-20MA OUTPUT.
OFFER TO BE VALID FOR **120 DAYS** FROM THE CLOSING DATE OF BID.

| SCHEDULE A – BASIC UNIT | | | |
|--------------------------|--|--------------------------------|---------------------|
| ITEM NO. | DESCRIPTION | | RATE (VAT Included) |
| 6.2.1. | Sensor for water level measurement: pressure transducer: piezo resistive sensor (stainless steel) with 4-20 mA output, complete as specified. | | |
| 6.2.2. | i. Transducer Cable (sensor) | Normal Cable (per meter) | |
| | ii. Transducer Cable (sensor) | Strengthened Cable (per meter) | |
| 6.2.3. | a) Data Cable | Normal Cable (per meter) | |
| | b) Data Cable | Strengthened Cable (per meter) | |
| 6.2.4. | Interfacing to logger | | |
| 6.2.5. | Any other accessories required for complete installation: | | |
| | (a) | | |
| | (b) | | |
| | (c) | | |
| | (d) | | |
| | (e) | | |
| SCHEDULE B – MAINTENANCE | | | |
| 6.2.6. | Cost of labour for repair / replacement of: (per hour) <ul style="list-style-type: none">Items not covered by the guarantee (Listed in Technical Schedules), orItems which have become damaged / defective due to causes for which the manufacturer cannot be held responsible | | |
| 6.2.7. | Cost of labour for General Maintenance and/or Back-up on Hardware and/or Software: (per hour) | | |
| 6.2.8. | Training at the two venues: (Include traveling, accommodation and meals) <ul style="list-style-type: none">North-West Province | | |

| | <ul style="list-style-type: none">• Eastern- or Southern Cape | |
|-------------------------------------|--|---------------------|
| | | |
| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
| 6.2.9. | Cost for assistance on installations for the first 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
| | | |
| | | |
| 6.2.10. | Cost for maintenance / assistance on equipment for the second 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
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| | | |
| 6.2.11. | Cost for maintenance / assistance on equipment for the third 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
| | | |
| | | |
| SCHEDULE B – SPARES | | |
| 6.2.12. | | |
| 6.2.13. | | |
| 6.2.14. | | |
| 6.2.15. | | |
| 6.2.16. | | |
| 6.2.17. | | |
| 6.2.18. | | |
| SCHEDULE C – ADDITIONAL ACCESSORIES | | |
| 6.2.19. | | |
| 6.2.20. | | |
| 6.2.21. | | |
| 6.2.22. | | |
| 6.2.23. | | |

| | | |
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| 6.2.24. | | |
| 6.2.25. | | |
| 6.2.26. | | |
| List all items of which the Prices are NOT FIRM, i.e. Effected by Rate of Exchange | | |
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| | | |
| Applicable Rate of Exchange (On date of Signature) | | |
| = R | | |

BIDDER'S SIGNATURE:

NAME OF BIDDER / COMPANY:

DATE:

- 6.3. PRICE SCHEDULES FOR SENSOR FOR WATER LEVEL MEASUREMENT:
PRESSURE TRANSDUCER: PIEZO RESISTIVE SENSOR (CERAMIC) WITH 4-20MA
OUTPUT.OFFER TO BE VALID FOR **120 DAYS** FROM THE CLOSING DATE OF BID.

| SCHEDULE A – BASIC UNIT | | | |
|--------------------------|---|--------------------------------|---------------------|
| ITEM NO. | DESCRIPTION | | RATE (VAT Included) |
| 6.3.1. | Sensor for water level measurement: pressure transducer: piezo resistive sensor (ceramic) with 4-20 mA output, complete as specified. | | |
| 6.3.2. | a) Transducer Cable (sensor) | Normal Cable (per meter) | |
| | b) Transducer Cable (sensor) | Strengthened Cable (per meter) | |
| 6.3.3. | a) Data Cable | Normal Cable (per meter) | |
| | b) Data Cable | Strengthened Cable (per meter) | |
| 6.3.4. | Interfacing to logger | | |
| 6.3.5. | Any other accessories required for complete installation: | | |
| | (a) | | |
| | (b) | | |
| | (c) | | |
| | (d) | | |
| | (e) | | |
| SCHEDULE B – MAINTENANCE | | | |
| 6.3.6. | Cost of labour for repair / replacement of: (per hour) <ul style="list-style-type: none">Items not covered by the guarantee (Listed in Technical Schedules), orItems which have become damaged / defective due to causes for which the manufacturer cannot be held responsible | | |
| 6.3.7. | Cost of labour for General Maintenance and/or Back-up on Hardware and/or Software: (per hour) | | |
| 6.3.8. | Training at the two venues: (Include traveling, accommodation and meals) <ul style="list-style-type: none">North-West Province | | |
| | <ul style="list-style-type: none">Eastern- or Southern Cape | | |

| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
|-------------------------------------|--|---------------------|
| 6.3.9. | Cost for assistance on installations for the first 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
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| 6.3.10. | Cost for maintenance / assistance on equipment for the second 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
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| | | |
| 6.3.11. | Cost for maintenance / assistance on equipment for the third 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
| | | |
| | | |
| SCHEDULE B – SPARES | | |
| 6.3.12. | | |
| 6.3.13. | | |
| 6.3.14. | | |
| 6.3.15. | | |
| 6.3.16. | | |
| 6.3.17. | | |
| 6.3.18. | | |
| SCHEDULE C – ADDITIONAL ACCESSORIES | | |
| 6.3.19. | | |
| 6.3.20. | | |
| 6.3.21. | | |
| 6.3.22. | | |
| 6.3.23. | | |
| 6.3.24. | | |

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| 6.3.25. | | |
| 6.3.26. | | |
| List all items of which the Prices are NOT FIRM, i.e. Effected by Rate of Exchange | | |
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| Applicable Rate of Exchange (On date of Signature) | | |
| = R | | |

BIDDER'S SIGNATURE:

NAME OF BIDDER / COMPANY:

DATE:

| | <ul style="list-style-type: none">• Eastern- or Southern Cape | |
|-------------------------------------|--|---------------------|
| | | |
| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
| 6.4.9. | Cost for assistance on installations for the first 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
| | | |
| | | |
| 6.4.10. | Cost for maintenance / assistance on equipment for the second 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
| | | |
| | | |
| 6.4.11. | Cost for maintenance / assistance on equipment for the third 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
| | | |
| | | |
| SCHEDULE B – SPARES | | |
| 6.4.12. | | |
| 6.4.13. | | |
| 6.4.14. | | |
| 6.4.15. | | |
| 6.4.16. | | |
| 6.4.17. | | |
| 6.4.18. | | |
| SCHEDULE C – ADDITIONAL ACCESSORIES | | |
| 6.4.19. | | |
| 6.4.20. | | |
| 6.4.21. | | |
| 6.4.22. | | |
| 6.4.23. | | |

| | | |
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| 6.4.24. | | |
| 6.4.25. | | |
| 6.4.26. | | |
| List all items of which the Prices are NOT FIRM, i.e. Effected by Rate of Exchange | | |
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| Applicable Rate of Exchange (On date of Signature) | | |
| = R | | |

BIDDER'S SIGNATURE:

NAME OF BIDDER / COMPANY:

DATE:

- 6.5. PRICE SCHEDULES FOR SENSOR FOR WATER LEVEL MEASUREMENT:
PRESSURE TRANSDUCER: PIEZO RESISTIVE SENSOR (CERAMIC) WITH SDI12
OUTPUT. OFFER TO BE VALID FOR **120 DAYS** FROM THE CLOSING DATE OF BID.

| SCHEDULE A – BASIC UNIT | | |
|--------------------------|--|---------------------------------------|
| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
| 6.5.1. | Sensor for water level measurement: pressure transducer: piezo resistive sensor (ceramic) with SDI12 output, complete as specified. | |
| 6.5.2. | a) Transducer Cable (sensor) | Normal Cable (per meter) |
| | b) Transducer Cable (sensor) | Strengthened Cable (per meter) |
| 6.5.3. | a) Data Cable | Normal Cable (per meter) |
| | b) Data Cable | Strengthened Cable (per meter) |
| 6.5.4. | Interfacing to logger | |
| 6.5.5. | Any other accessories required for complete installation: (a) | |
| | (b) | |
| | (c) | |
| | (d) | |
| | (e) | |
| SCHEDULE B – MAINTENANCE | | |
| 6.5.6. | Cost of labour for repair / replacement of: (per hour) <ul style="list-style-type: none"> Items not covered by the guarantee (Listed in Technical Schedules), or Items which have become damaged / defective due to causes for which the manufacturer cannot be held responsible | |
| 6.5.7. | Cost of labour for General Maintenance and/or Back-up on Hardware and/or Software: (per hour) | |
| 6.5.8. | Training at the two venues: (Include traveling, accommodation and meals) <ul style="list-style-type: none"> North-West Province | |
| | <ul style="list-style-type: none"> Eastern- or Southern Cape | |

| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
|-------------------------------------|--|---------------------|
| 6.5.9. | Cost for assistance on installations for the first 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
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| | | |
| 6.5.10. | Cost for maintenance / assistance on equipment for the second 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
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| | | |
| 6.5.11. | Cost for maintenance / assistance on equipment for the third 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
| | | |
| | | |
| SCHEDULE B – SPARES | | |
| 6.5.12. | | |
| 6.5.13. | | |
| 6.5.14. | | |
| 6.5.15. | | |
| 6.5.16. | | |
| 6.5.17. | | |
| 6.5.18. | | |
| SCHEDULE C – ADDITIONAL ACCESSORIES | | |
| 6.5.19. | | |
| 6.5.20. | | |
| 6.5.21. | | |
| 6.5.22. | | |
| 6.5.23. | | |
| 6.5.24. | | |

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| 6.5.25. | | |
| 6.5.26. | | |
| List all items of which the Prices are NOT FIRM, i.e. Effected by Rate of Exchange | | |
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| Applicable Rate of Exchange (On date of Signature) | | |
| = R | | |

BIDDER'S SIGNATURE:

NAME OF BIDDER / COMPANY:

DATE:

6.6. PRICE SCHEDULES FOR SENSOR FOR WATER LEVEL MEASUREMENT:
BUBBLER: OFFER TO BE VALID FOR **120 DAYS** FROM THE CLOSING DATE OF BID.

| SCHEDULE A – BASIC UNIT | | |
|--------------------------|--|---------------------|
| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
| 6.6.1. | Sensor for water level measurement: bubbler, complete as specified. | |
| 6.6.2. | Measuring tube (per meter) | |
| 6.6.3. | Bubble chamber | |
| 6.6.4. | Non-stretch, age resistant rope (per meter) | |
| 6.6.5. | Interfacing to logger | |
| 6.6.6. | Any other accessories required for complete installation: | |
| | (a) | |
| | (b) | |
| | (c) | |
| | (d) | |
| | (e) | |
| SCHEDULE B – MAINTENANCE | | |
| 6.6.7. | Cost of labour for repair / replacement of: (per hour) <ul style="list-style-type: none"> Items not covered by the guarantee (Listed in Technical Schedules), or Items which have become damaged / defective due to causes for which the manufacturer cannot be held responsible | |
| 6.6.8. | Cost of labour for General Maintenance and/or Back-up on Hardware and/or Software: (per hour) | |
| 6.6.9. | Training at the two venues: (Include traveling, accommodation and meals) <ul style="list-style-type: none"> North-West Province Eastern- or Southern Cape | |
| | | |
| | | |

| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
|-------------------------------------|--|---------------------|
| 6.6.10. | Cost for assistance on installations for the first 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
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| 6.6.11. | Cost for maintenance / assistance on equipment for the second 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
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| 6.6.12. | Cost for maintenance / assistance on equipment for the third 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
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| | | |
| SCHEDULE B – SPARES | | |
| 6.6.13. | | |
| 6.6.14. | | |
| 6.6.15. | | |
| 6.6.16. | | |
| 6.6.17. | | |
| 6.6.18. | | |
| 6.6.19. | | |
| SCHEDULE C – ADDITIONAL ACCESSORIES | | |
| 6.6.20. | | |
| 6.6.21. | | |
| 6.6.22. | | |
| 6.6.23. | | |
| 6.6.24. | | |
| 6.6.25. | | |
| 6.6.26. | | |

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| 6.6.27. | | | |
| List all items of which the Prices are NOT FIRM, i.e. Effected by Rate of Exchange | | | |
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| Applicable Rate of Exchange (On date of Signature) | | | |
| = R | | | |

BIDDER'S SIGNATURE:

NAME OF BIDDER / COMPANY:

DATE:

- 6.7. PRICE SCHEDULES FOR SENSOR FOR WATER LEVEL MEASUREMENT: RADAR SENSOR WITH MEASURING RANGE: 8 METER.
OFFER TO BE VALID FOR **120 DAYS** FROM THE CLOSING DATE OF BID.

| SCHEDULE A – BASIC UNIT | | |
|--------------------------|---|---|
| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
| 6.7.1. | Sensor for water level measurement: radar sensor with measuring range: 8 meter, complete as specified. | |
| 6.7.2. | a) Data Cable | Normal Cable (per meter) |
| | b) Data Cable | Strengthened Cable (per meter) |
| 6.7.3. | Surge protection | |
| 6.7.4. | Interfacing to logger | |
| 6.7.5. | Any other accessories required for complete installation: (a) | |
| | (b) | |
| | (c) | |
| | (d) | |
| | (e) | |
| SCHEDULE B – MAINTENANCE | | |
| 6.7.6. | Cost of labour for repair / replacement of: (per hour) <ul style="list-style-type: none"> Items not covered by the guarantee (Listed in Technical Schedules), or Items which have become damaged / defective due to causes for which the manufacturer cannot be held responsible | |
| 6.7.7. | Cost of labour for General Maintenance and/or Back-up on Hardware and/or Software: (per hour) | |
| 6.7.8. | Training at the two venues: (Include traveling, accommodation and meals) <ul style="list-style-type: none"> North-West Province Eastern- or Southern Cape | |
| | | |
| | | |

| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
|-------------------------------------|--|---------------------|
| 6.7.9. | Cost for assistance on installations for the first 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
| | | |
| | | |
| 6.7.10. | Cost for maintenance / assistance on equipment for the second 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
| | | |
| | | |
| 6.7.11. | Cost for maintenance / assistance on equipment for the third 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
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| | | |
| SCHEDULE B – SPARES | | |
| 6.7.12. | | |
| 6.7.13. | | |
| 6.7.14. | | |
| 6.7.15. | | |
| 6.7.16. | | |
| 6.7.17. | | |
| 6.7.18. | | |
| SCHEDULE C – ADDITIONAL ACCESSORIES | | |
| 6.7.19. | | |
| 6.7.20. | | |
| 6.7.21. | | |
| 6.7.22. | | |
| 6.7.23. | | |
| 6.7.24. | | |
| 6.7.25. | | |

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| 6.7.26. | | | |
| List all items of which the Prices are NOT FIRM, i.e. Effected by Rate of Exchange | | | |
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| Applicable Rate of Exchange (On date of Signature) | | | |
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BIDDER'S SIGNATURE:

NAME OF BIDDER / COMPANY:

DATE:

- 6.8. PRICE SCHEDULES FOR SENSOR FOR WATER LEVEL MEASUREMENT: RADAR SENSOR WITH MEASURING RANGE: 15 METER.
OFFER TO BE VALID FOR **120 DAYS** FROM THE CLOSING DATE OF BID.

| SCHEDULE A – BASIC UNIT | | | |
|--------------------------|---|---------------------------------------|---------------------|
| ITEM NO. | DESCRIPTION | | RATE (VAT Included) |
| 6.8.1. | Sensor for water level measurement: radar sensor with measuring range: 15 meter, complete as specified. | | |
| 6.8.2. | a) Data Cable | Normal Cable (per meter) | |
| | b) Data Cable | Strengthened Cable (per meter) | |
| 6.8.3. | Surge protection | | |
| 6.8.4. | Interfacing to logger | | |
| 6.8.5. | Any other accessories required for complete installation: | | |
| | (a) | | |
| | (b) | | |
| | (c) | | |
| | (d) | | |
| | (e) | | |
| SCHEDULE B – MAINTENANCE | | | |
| 6.8.6. | Cost of labour for repair / replacement of: (per hour) <ul style="list-style-type: none">Items not covered by the guarantee (Listed in Technical Schedules), orItems which have become damaged / defective due to causes for which the manufacturer cannot be held responsible | | |
| 6.8.7. | Cost of labour for General Maintenance and/or Back-up on Hardware and/or Software: (per hour) | | |
| 6.8.8. | Training at the two venues: (Include traveling, accommodation and meals) <ul style="list-style-type: none">North-West ProvinceEastern- or Southern Cape | | |
| | | | |
| | | | |

| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
|-------------------------------------|--|---------------------|
| 6.8.9. | Cost for assistance on installations for the first 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
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| | | |
| 6.8.10. | Cost for maintenance / assistance on equipment for the second 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
| | | |
| | | |
| 6.8.11. | Cost for maintenance / assistance on equipment for the third 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
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| | | |
| SCHEDULE B – SPARES | | |
| 6.8.12. | | |
| 6.8.13. | | |
| 6.8.14. | | |
| 6.8.15. | | |
| 6.8.16. | | |
| 6.8.17. | | |
| 6.8.18. | | |
| SCHEDULE C – ADDITIONAL ACCESSORIES | | |
| 6.8.19. | | |
| 6.8.20. | | |
| 6.8.21. | | |
| 6.8.22. | | |
| 6.8.23. | | |
| 6.8.24. | | |
| 6.8.25. | | |

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| 6.8.26. | | | |
| List all items of which the Prices are NOT FIRM, i.e. Effected by Rate of Exchange | | | |
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| Applicable Rate of Exchange (On date of Signature) | | | |
| = R | | | |

BIDDER'S SIGNATURE:

NAME OF BIDDER / COMPANY:

DATE:

- 6.9. PRICE SCHEDULES FOR SENSOR FOR WATER LEVEL MEASUREMENT: RADAR SENSOR WITH MEASURING RANGE: 30 METER.
OFFER TO BE VALID FOR **120 DAYS** FROM THE CLOSING DATE OF BID.

| SCHEDULE A – BASIC UNIT | | |
|--------------------------|---|---|
| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
| 6.9.1. | Sensor for water level measurement: radar sensor with measuring range: 30 meter, complete as specified. | |
| 6.9.2. a | Data Cable | Normal Cable (per meter) |
| 6.9.2. b | | Strengthened Cable (per meter) |
| 6.9.3. | Surge protection | |
| 6.9.4. | Interfacing to logger | |
| 6.9.5. | Any other accessories required for complete installation: (a) | |
| | (b) | |
| | (c) | |
| | (d) | |
| | (e) | |
| SCHEDULE B – MAINTENANCE | | |
| 6.9.6. | Cost of labour for repair / replacement of: (per hour) <ul style="list-style-type: none"> Items not covered by the guarantee (Listed in Technical Schedules), or Items which have become damaged / defective due to causes for which the manufacturer cannot be held responsible | |
| 6.9.7. | Cost of labour for General Maintenance and/or Back-up on Hardware and/or Software: (per hour) | |
| 6.9.8. | Training at the two venues: (Include traveling, accommodation and meals) <ul style="list-style-type: none"> North-West Province Eastern- or Southern Cape | |
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| | | |

| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
|-------------------------------------|--|---------------------|
| 6.9.9. | Cost for assistance on installations for the first 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
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| | | |
| 6.9.10. | Cost for maintenance / assistance on equipment for the second 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
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| | | |
| 6.9.11. | Cost for maintenance / assistance on equipment for the third 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
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| | | |
| SCHEDULE B – SPARES | | |
| 6.9.12. | | |
| 6.9.13. | | |
| 6.9.14. | | |
| 6.9.15. | | |
| 6.9.16. | | |
| 6.9.17. | | |
| 6.9.18. | | |
| SCHEDULE C – ADDITIONAL ACCESSORIES | | |
| 6.9.19. | | |
| 6.9.20. | | |
| 6.9.21. | | |
| 6.9.22. | | |
| 6.9.23. | | |
| 6.9.24. | | |
| 6.9.25. | | |

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| 6.9.26. | | | |
| List all items of which the Prices are NOT FIRM, i.e. Effected by Rate of Exchange | | | |
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| Applicable Rate of Exchange (On date of Signature) | | | |
| = R | | | |

BIDDER’S SIGNATURE:

NAME OF BIDDER / COMPANY:

DATE:

6.10. PRICE SCHEDULES FOR SENSOR FOR WATER LEVEL MEASUREMENT: CONTACT GAUGE. OFFER TO BE VALID FOR **120 DAYS** FROM THE CLOSING DATE OF BID.

| SCHEDULE A – BASIC UNIT | | |
|--------------------------|--|---------------------|
| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
| 6.10.1. | Contact gauge, complete as specified. Measuring range: 50 m (more ranges listed below). | |
| 6.10.2. | Contact gauge, complete. Measuring range: 80 m. | |
| 6.10.3. | Contact gauge, complete. Measuring range: 100 m. | |
| 6.10.4. | Contact gauge, complete. Measuring range: 150 m. | |
| 6.10.5. | Contact gauge, complete. Measuring range: 200 m. | |
| 6.10.6. | Contact gauge, complete. Measuring range: 250 m. | |
| 6.10.7. | Contact gauge, complete. Measuring range: 500 m. | |
| 6.10.8. | Contact gauge, complete. Measuring range: 750 m. | |
| 6.10.9. | Robust carry case. | |
| 6.10.10. | Any other accessories required for complete installation: | |
| | (a) | |
| | (b) | |
| | (c) | |
| | (d) | |
| | (e) | |
| SCHEDULE B – MAINTENANCE | | |
| 6.10.11. | Cost of labour for repair / replacement of: (per hour) <ul style="list-style-type: none"> Items not covered by the guarantee (Listed in Technical Schedules), or Items which have become damaged / defective due to causes for which the manufacturer cannot be held responsible | |
| 6.10.12. | Cost of labour for General Maintenance and/or Back-up on Hardware and/or Software: (per hour) | |
| 6.10.13. | Training at the two venues: (Include traveling, accommodation and meals) <ul style="list-style-type: none"> North-West Province | |

| | <ul style="list-style-type: none">• Eastern- or Southern Cape | |
|-------------------------------------|--|---------------------|
| | | |
| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
| 6.10.14. | Cost for assistance on installations for the first 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
| | | |
| | | |
| 6.10.15. | Cost for maintenance / assistance on equipment for the second 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
| | | |
| | | |
| 6.10.16. | Cost for maintenance / assistance on equipment for the third 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
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| | | |
| SCHEDULE B – SPARES | | |
| 6.10.17. | | |
| 6.10.18. | | |
| 6.10.19. | | |
| 6.10.20. | | |
| 6.10.21. | | |
| 6.10.22. | | |
| 6.10.23. | | |
| SCHEDULE C – ADDITIONAL ACCESSORIES | | |
| 6.10.24. | | |
| 6.10.25. | | |
| 6.10.26. | | |
| 6.10.27. | | |
| 6.10.28. | | |

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| 6.10.29. | | |
| 6.10.30. | | |
| 6.10.31. | | |
| List all items of which the Prices are NOT FIRM, i.e. Effected by Rate of Exchange | | |
| | | |
| | | |
| | | |
| Applicable Rate of Exchange (On date of Signature) | | |
| = R | | |

BIDDER'S SIGNATURE:

NAME OF BIDDER / COMPANY:

DATE:

6.11. PRICE SCHEDULES FOR SENSOR FOR WATER LEVEL MEASUREMENT: CONTACT GAUGE WITH TEMPERATURE.

OFFER TO BE VALID FOR **120 DAYS** FROM THE CLOSING DATE OF BID.

| SCHEDULE A – BASIC UNIT | | |
|--------------------------|---|---------------------|
| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
| 6.11.1. | Contact gauge with temperature, complete as specified. Measuring range: 50 m. (more ranges listed below). | |
| 6.11.2. | Contact gauge with temperature, complete. Measuring range: 80 m. | |
| 6.11.3. | Contact gauge with temperature, complete. Measuring range: 100 m. | |
| 6.11.4. | Contact gauge with temperature, complete. Measuring range: 150 m. | |
| 6.11.5. | Contact gauge with temperature, complete. Measuring range: 200 m. | |
| 6.11.6. | Contact gauge with temperature, complete. Measuring range: 250 m. | |
| 6.11.7. | Contact gauge with temperature, complete. Measuring range: 500 m. | |
| 6.11.8. | Contact gauge with temperature, complete. Measuring range: 750 m. | |
| 6.11.9. | Robust carry case. | |
| 6.11.10. | Any other accessories required for complete installation: | |
| | (a) | |
| | (b) | |
| | (c) | |
| | (d) | |
| | (e) | |
| SCHEDULE B – MAINTENANCE | | |
| 6.11.11. | <p>Cost of labour for repair / replacement of: (per hour)</p> <ul style="list-style-type: none"> Items not covered by the guarantee (Listed in Technical Schedules), or Items which have become damaged / defective due to causes for which the manufacturer cannot be held responsible | |

| 6.11.12. | Cost of labour for General Maintenance and/or Back-up on Hardware and/or Software: (per hour) | |
|-------------------------------------|--|---------------------|
| 6.11.13. | Training at the two venues: (Include traveling, accommodation and meals) <ul style="list-style-type: none">• North-West Province• Eastern- or Southern Cape | |
| | | |
| | | |
| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
| 6.11.14. | Cost for assistance on installations for the first 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
| | | |
| | | |
| 6.11.15. | Cost for maintenance / assistance on equipment for the second 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
| | | |
| | | |
| 6.11.16. | Cost for maintenance / assistance on equipment for the third 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
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| | | |
| SCHEDULE B – SPARES | | |
| 6.11.17. | | |
| 6.11.18. | | |
| 6.11.19. | | |
| 6.11.20. | | |
| 6.11.21. | | |
| 6.11.22. | | |
| 6.11.23. | | |
| SCHEDULE C – ADDITIONAL ACCESSORIES | | |
| 6.11.24. | | |

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| 6.11.25. | | |
| 6.11.26. | | |
| 6.11.27. | | |
| 6.11.28. | | |
| 6.11.29. | | |
| 6.11.30. | | |
| 6.11.31. | | |
| List all items of which the Prices are NOT FIRM, i.e. Effected by Rate of Exchange | | |
| | | |
| | | |
| | | |
| Applicable Rate of Exchange (On date of Signature) | | |
| = R | | |

BIDDER'S SIGNATURE:

NAME OF BIDDER / COMPANY:

DATE:

- 6.12. PRICE SCHEDULES FOR SENSOR FOR WEATHER MEASUREMENT: RAIN GAUGE, TIPPING BUCKET WITH INTEGRATED SYPHON MECHANISM (HIGH LEVELS OF ACCURACY), POWDER COATED ALUMINIUM ONLY:
OFFER TO BE VALID FOR **120 DAYS** FROM THE CLOSING DATE OF BID.

| SCHEDULE A – BASIC UNIT | | |
|--------------------------|--|---|
| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
| 6.12.1. | Sensor for weather measurement: rain gauge, tipping bucket with integrated syphon mechanism (high levels of accuracy), powder coated aluminium only, complete as specified. | |
| 6.12.2. | a) Data Cable | Normal Cable (per meter) |
| | b) Data Cable | Strengthened Cable (per meter) |
| 6.12.3. | Surge protection | |
| 6.12.4. | Interfacing to logger | |
| 6.12.5. | Optional Single channel data logger | |
| 6.12.6. | Interfacing to Data Transmission System (per system) | |
| 6.12.7. | Bi-directional Communication Serial Cable (Data Logger ⇒ Laptop / Tablet or Smartphone) | |
| 6.12.8. | Any other accessories required for complete installation: | |
| | (a) | |
| | (b) | |
| | (c) | |
| | (d) | |
| | (e) | |
| SCHEDULE B – MAINTENANCE | | |
| 6.12.9. | Cost of labour for repair / replacement of: (per hour) <ul style="list-style-type: none"> Items not covered by the guarantee (Listed in Technical Schedules), or Items which have become damaged / defective due to causes for which the manufacturer cannot be held responsible | |
| 6.12.10. | Cost of labour for General Maintenance and/or Back-up on Hardware and/or Software: (per hour) | |

| 6.12.11. | Training at the two venues: (Include traveling, accommodation and meals) <ul style="list-style-type: none">• North-West Province• Eastern- or Southern Cape | |
|-------------------------------------|--|---------------------|
| | | |
| | | |
| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
| 6.12.12. | Cost for assistance on installations for the first 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
| | | |
| | | |
| 6.12.13. | Cost for maintenance / assistance on equipment for the second 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
| | | |
| | | |
| 6.12.14. | Cost for maintenance / assistance on equipment for the third 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
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| | | |
| SCHEDULE B – SPARES | | |
| 6.12.15. | | |
| 6.12.16. | | |
| 6.12.17. | | |
| 6.12.18. | | |
| 6.12.19. | | |
| 6.12.20. | | |
| 6.12.21. | | |
| SCHEDULE C – ADDITIONAL ACCESSORIES | | |
| 6.12.22. | | |
| 6.12.23. | | |
| 6.12.24. | | |

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| 6.12.25. | | |
| 6.12.26. | | |
| 6.12.27. | | |
| 6.12.28. | | |
| 6.12.29. | | |
| List all items of which the Prices are NOT FIRM, i.e. Effected by Rate of Exchange | | |
| | | |
| | | |
| | | |
| Applicable Rate of Exchange (On date of Signature) | | |
| = R | | |

BIDDER'S SIGNATURE:

NAME OF BIDDER / COMPANY:

DATE:

- 6.13. PRICE SCHEDULES FOR SENSOR FOR WEATHER MEASUREMENT: RAIN GAUGE, TIPPING BUCKET WITH INTEGRATED SYPHON MECHANISM (HIGH LEVELS OF ACCURACY), POWDER COATED ALUMINIUM/ ASA POLYMER:
OFFER TO BE VALID FOR **120 DAYS** FROM THE CLOSING DATE OF BID.

| SCHEDULE A – BASIC UNIT | | |
|--------------------------|--|---|
| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
| 6.13.1. | Sensor for weather measurement: rain gauge, tipping bucket with integrated syphon mechanism (high levels of accuracy), powder coated aluminium / ASA polymer, complete as specified. | |
| 6.13.2. | a) Data Cable | Normal Cable (per meter) |
| | b) Data Cable | Strengthened Cable (per meter) |
| 6.13.3. | Surge protection | |
| 6.13.4. | Interfacing to logger | |
| 6.13.5. | Optional Single channel data logger | |
| 6.13.6. | Interfacing to Data Transmission System (per system) | |
| 6.13.7. | Bi-directional Communication Serial Cable (Data Logger ⇒ Laptop / Tablet or Smartphone) | |
| 6.13.8. | Any other accessories required for complete installation: | |
| | (a) | |
| | (b) | |
| | (c) | |
| | (d) | |
| | (e) | |
| SCHEDULE B – MAINTENANCE | | |
| 6.13.9. | Cost of labour for repair / replacement of: (per hour) <ul style="list-style-type: none"> Items not covered by the guarantee (Listed in Technical Schedules), or Items which have become damaged / defective due to causes for which the manufacturer cannot be held responsible | |
| 6.13.10. | Cost of labour for General Maintenance and/or Back-up on Hardware and/or Software: (per hour) | |

| 6.13.11. | Training at the two venues: (Include traveling, accommodation and meals) <ul style="list-style-type: none">• North-West Province• Eastern- or Southern Cape | |
|-------------------------------------|--|---------------------|
| | | |
| | | |
| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
| 6.13.12. | Cost for assistance on installations for the first 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
| | | |
| | | |
| 6.13.13. | Cost for maintenance / assistance on equipment for the second 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
| | | |
| | | |
| 6.13.14. | Cost for maintenance / assistance on equipment for the third 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
| | | |
| | | |
| SCHEDULE B – SPARES | | |
| 6.13.15. | | |
| 6.13.16. | | |
| 6.13.17. | | |
| 6.13.18. | | |
| 6.13.19. | | |
| 6.13.20. | | |
| 6.13.21. | | |
| SCHEDULE C – ADDITIONAL ACCESSORIES | | |
| 6.13.22. | | |
| 6.13.23. | | |
| 6.13.24. | | |

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| 6.13.25. | | |
| 6.13.26. | | |
| 6.13.27. | | |
| 6.13.28. | | |
| 6.13.29. | | |
| List all items of which the Prices are NOT FIRM, i.e. Effected by Rate of Exchange | | |
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| | | |
| | | |
| Applicable Rate of Exchange (On date of Signature) | | |
| = R | | |

BIDDER'S SIGNATURE:

NAME OF BIDDER / COMPANY:

DATE:

- 6.14. PRICE SCHEDULES FOR SENSOR FOR WEATHER MEASUREMENT: RAIN GAUGE, TIPPING BUCKET WITH INTEGRATED SYPHON MECHANISM (HIGH LEVELS OF ACCURACY), FOR LOW RAINFALL EVENTS, POWDER COATED ALUMINIUM/ ASA POLYMER: OFFER TO BE VALID FOR **120 DAYS** FROM THE CLOSING DATE OF BID.

| SCHEDULE A – BASIC UNIT | | |
|--------------------------|--|---|
| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
| 6.14.1. | Sensor for weather measurement: rain gauge, tipping bucket with integrated syphon mechanism (high levels of accuracy), for low rainfall events, powder coated aluminium / ASA polymer, complete as specified. | |
| 6.14.2. | a) Data Cable | Normal Cable (per meter) |
| | b) Data Cable | Strengthened Cable (per meter) |
| 6.14.3. | Surge protection | |
| 6.14.4. | Interfacing to logger | |
| 6.14.5. | Optional Single channel data logger | |
| 6.14.6. | Interfacing to Data Transmission System (per system) | |
| 6.14.7. | Bi-directional Communication Serial Cable (Data Logger ⇒ Laptop / Tablet or Smartphone) | |
| 6.14.8. | Any other accessories required for complete installation: | |
| | (a) | |
| | (b) | |
| | (c) | |
| | (d) | |
| | (e) | |
| SCHEDULE B – MAINTENANCE | | |
| 6.14.9. | Cost of labour for repair / replacement of: (per hour) <ul style="list-style-type: none"> Items not covered by the guarantee (Listed in Technical Schedules), or Items which have become damaged / defective due to causes for which the manufacturer cannot be held responsible | |
| 6.14.10. | Cost of labour for General Maintenance and/or Back-up on Hardware and/or Software: (per hour) | |

| 6.14.11. | Training at the two venues: (Include traveling, accommodation and meals) <ul style="list-style-type: none">• North-West Province• Eastern- or Southern Cape | |
|-------------------------------------|--|---------------------|
| | | |
| | | |
| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
| 6.14.12. | Cost for assistance on installations for the first 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
| | | |
| | | |
| 6.14.13. | Cost for maintenance / assistance on equipment for the second 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
| | | |
| | | |
| 6.14.14. | Cost for maintenance / assistance on equipment for the third 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
| | | |
| | | |
| SCHEDULE B – SPARES | | |
| 6.14.15. | | |
| 6.14.16. | | |
| 6.14.17. | | |
| 6.14.18. | | |
| 6.14.19. | | |
| 6.14.20. | | |
| 6.14.21. | | |
| SCHEDULE C – ADDITIONAL ACCESSORIES | | |
| 6.14.22. | | |
| 6.14.23. | | |
| 6.14.24. | | |

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| 6.14.25. | | |
| 6.14.26. | | |
| 6.14.27. | | |
| 6.14.28. | | |
| 6.14.29. | | |
| List all items of which the Prices are NOT FIRM, i.e. Effected by Rate of Exchange | | |
| | | |
| | | |
| | | |
| Applicable Rate of Exchange (On date of Signature) | | |
| = R | | |

BIDDER'S SIGNATURE:

NAME OF BIDDER / COMPANY:

DATE:

- 6.15. PRICE SCHEDULES FOR SENSOR FOR WEATHER MEASUREMENT: RAIN GAUGE, TIPPING BUCKET WITH INTEGRATED SYPHON MECHANISM (HIGH LEVELS OF ACCURACY), ASA POLYMER:
OFFER TO BE VALID FOR **120 DAYS** FROM THE CLOSING DATE OF BID.

| SCHEDULE A – BASIC UNIT | | |
|--------------------------|--|---|
| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
| 6.15.1. | Sensor for weather measurement: rain gauge, tipping bucket with integrated syphon mechanism (high levels of accuracy), for low rainfall events, ASA polymer, complete as specified. | |
| 6.15.2. | a) Data Cable | Normal Cable (per meter) |
| | b) Data Cable | Strengthened Cable (per meter) |
| 6.15.3. | Surge protection | |
| 6.15.4. | Interfacing to logger | |
| 6.15.5. | Optional Single channel data logger | |
| 6.15.6. | Interfacing to Data Transmission System (per system) | |
| 6.15.7. | Bi-directional Communication Serial Cable (Data Logger ⇒ Laptop / Tablet or Smartphone) | |
| 6.15.8. | Any other accessories required for complete installation: | |
| | (a) | |
| | (b) | |
| | (c) | |
| | (d) | |
| | (e) | |
| SCHEDULE B – MAINTENANCE | | |
| 6.15.9. | Cost of labour for repair / replacement of: (per hour) <ul style="list-style-type: none"> Items not covered by the guarantee (Listed in Technical Schedules), or Items which have become damaged / defective due to causes for which the manufacturer cannot be held responsible | |
| 6.15.10. | Cost of labour for General Maintenance and/or Back-up on Hardware and/or Software: (per hour) | |

| 6.15.11. | Training at the two venues: (Include traveling, accommodation and meals) <ul style="list-style-type: none">• North-West Province• Eastern- or Southern Cape | |
|-------------------------------------|--|---------------------|
| | | |
| | | |
| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
| 6.15.12. | Cost for assistance on installations for the first 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
| | | |
| | | |
| 6.15.13. | Cost for maintenance / assistance on equipment for the second 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
| | | |
| | | |
| 6.15.14. | Cost for maintenance / assistance on equipment for the third 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
| | | |
| | | |
| SCHEDULE B – SPARES | | |
| 6.15.15. | | |
| 6.15.16. | | |
| 6.15.17. | | |
| 6.15.18. | | |
| 6.15.19. | | |
| 6.15.20. | | |
| 6.15.21. | | |
| SCHEDULE C – ADDITIONAL ACCESSORIES | | |
| 6.15.22. | | |
| 6.15.23. | | |
| 6.15.24. | | |

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| 6.15.25. | | |
| 6.15.26. | | |
| 6.15.27. | | |
| 6.15.28. | | |
| 6.15.29. | | |
| List all items of which the Prices are NOT FIRM, i.e. Effected by Rate of Exchange | | |
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| | | |
| Applicable Rate of Exchange (On date of Signature) | | |
| = R | | |

BIDDER'S SIGNATURE:

NAME OF BIDDER / COMPANY:

DATE:

6.16. PRICE SCHEDULES FOR SENSOR FOR WEATHER MEASUREMENT: BAROMETRIC PRESSURE: OFFER TO BE VALID FOR **120 DAYS** FROM THE CLOSING DATE OF BID.

| SCHEDULE A – BASIC UNIT | | |
|--------------------------|---|---|
| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
| 6.16.1. | Sensor for weather measurement: barometric pressure, complete as specified. | |
| 6.16.2. | a) Data Cable | Normal Cable (per meter) |
| | b) Data Cable | Strengthened Cable (per meter) |
| 6.16.3. | Interfacing to logger | |
| 6.16.4. | Any other accessories required for complete installation: (a) | |
| | (b) | |
| | (c) | |
| | (d) | |
| | (e) | |
| SCHEDULE B – MAINTENANCE | | |
| 6.16.5. | Cost of labour for repair / replacement of: (per hour) <ul style="list-style-type: none"> Items not covered by the guarantee (Listed in Technical Schedules), or Items which have become damaged / defective due to causes for which the manufacturer cannot be held responsible | |
| 6.16.6. | Cost of labour for General Maintenance and/or Back-up on Hardware and/or Software: (per hour) | |
| 6.16.7. | Training at the two venues: (Include traveling, accommodation and meals) <ul style="list-style-type: none"> North-West Province Eastern- or Southern Cape | |
| | | |
| | | |

| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
|-------------------------------------|--|---------------------|
| 6.16.8. | Cost for assistance on installations for the first 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
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| | | |
| 6.16.9. | Cost for maintenance / assistance on equipment for the second 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
| | | |
| | | |
| 6.16.10. | Cost for maintenance / assistance on equipment for the third 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
| | | |
| | | |
| SCHEDULE B – SPARES | | |
| 6.16.11. | | |
| 6.16.12. | | |
| 6.16.13. | | |
| 6.16.14. | | |
| 6.16.15. | | |
| 6.16.16. | | |
| 6.16.17. | | |
| SCHEDULE C – ADDITIONAL ACCESSORIES | | |
| 6.16.18. | | |
| 6.16.19. | | |
| 6.16.20. | | |
| 6.16.21. | | |
| 6.16.22. | | |
| 6.16.23. | | |
| 6.16.24. | | |

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| 6.16.25. | | | | |
| List all items of which the Prices are NOT FIRM, i.e. Effected by Rate of Exchange | | | | |
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| | | | | |
| Applicable Rate of Exchange (On date of Signature) | | | | |
| = R | | | | |

BIDDER'S SIGNATURE:

NAME OF BIDDER / COMPANY:

DATE:

6.17. PRICE SCHEDULES FOR SENSOR FOR WEATHER MEASUREMENT: HUMIDITY AND AIR TEMPERATURE.

OFFER TO BE VALID FOR **120 DAYS** FROM THE CLOSING DATE OF BID.

| SCHEDULE A – BASIC UNIT | | |
|--------------------------|---|---|
| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
| 6.17.1. | Sensor for weather measurement: humidity and air temperature complete as specified. | |
| 6.17.2. | a) Data Cable | Normal Cable (per meter) |
| | b) Data Cable | Strengthened Cable (per meter) |
| 6.17.3. | Interfacing to logger | |
| 6.17.4. | Any other accessories required for complete installation: (a) | |
| | (b) | |
| | (c) | |
| | (d) | |
| | (e) | |
| SCHEDULE B – MAINTENANCE | | |
| 6.17.5. | Cost of labour for repair / replacement of: (per hour) <ul style="list-style-type: none"> Items not covered by the guarantee (Listed in Technical Schedules), or Items which have become damaged / defective due to causes for which the manufacturer cannot be held responsible | |
| 6.17.6. | Cost of labour for General Maintenance and/or Back-up on Hardware and/or Software: (per hour) | |
| 6.17.7. | Training at the two venues: (Include traveling, accommodation and meals) <ul style="list-style-type: none"> North-West Province Eastern- or Southern Cape | |
| | | |
| | | |

| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
|-------------------------------------|--|---------------------|
| 6.17.8. | Cost for assistance on installations for the first 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
| | | |
| | | |
| 6.17.9. | Cost for maintenance / assistance on equipment for the second 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
| | | |
| | | |
| 6.17.10. | Cost for maintenance / assistance on equipment for the third 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
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| SCHEDULE B – SPARES | | |
| 6.17.11. | | |
| 6.17.12. | | |
| 6.17.13. | | |
| 6.17.14. | | |
| 6.17.15. | | |
| 6.17.16. | | |
| 6.17.17. | | |
| SCHEDULE C – ADDITIONAL ACCESSORIES | | |
| 6.17.18. | | |
| 6.17.19. | | |
| 6.17.20. | | |
| 6.17.21. | | |
| 6.17.22. | | |
| 6.17.23. | | |
| 6.17.24. | | |

| | | | | |
|---|--|--|--|--|
| 6.17.25. | | | | |
| List all items of which the Prices are NOT FIRM, i.e. Effected by Rate of Exchange | | | | |
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| | | | | |
| Applicable Rate of Exchange (On date of Signature) | | | | |
| = R | | | | |

BIDDER'S SIGNATURE:

NAME OF BIDDER / COMPANY:

DATE:

6.18. PRICE SCHEDULES FOR SENSOR FOR WEATHER MEASUREMENT: WIND DIRECTION INDICATOR.

OFFER TO BE VALID FOR **120 DAYS** FROM THE CLOSING DATE OF BID.

| SCHEDULE A – BASIC UNIT | | |
|--------------------------|--|---|
| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
| 6.18.1. | Sensor for weather measurement: wind direction indicator, complete as specified. | |
| 6.18.2. | a) Data Cable | Normal Cable (per meter) |
| | b) Data Cable | Strengthened Cable (per meter) |
| 6.18.3. | Interfacing to logger | |
| 6.18.4. | Any other accessories required for complete installation: (a) | |
| | (b) | |
| | (c) | |
| | (d) | |
| | (e) | |
| SCHEDULE B – MAINTENANCE | | |
| 6.18.5. | Cost of labour for repair / replacement of: (per hour) <ul style="list-style-type: none"> Items not covered by the guarantee (Listed in Technical Schedules), or Items which have become damaged / defective due to causes for which the manufacturer cannot be held responsible | |
| 6.18.6. | Cost of labour for General Maintenance and/or Back-up on Hardware and/or Software: (per hour) | |
| 6.18.7. | Training at the two venues: (Include traveling, accommodation and meals) <ul style="list-style-type: none"> North-West Province Eastern- or Southern Cape | |
| | | |
| | | |

| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
|-------------------------------------|--|---------------------|
| 6.18.8. | Cost for assistance on installations for the first 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
| | | |
| | | |
| 6.18.9. | Cost for maintenance / assistance on equipment for the second 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
| | | |
| | | |
| 6.18.10. | Cost for maintenance / assistance on equipment for the third 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
| | | |
| | | |
| SCHEDULE B – SPARES | | |
| 6.18.11. | | |
| 6.18.12. | | |
| 6.18.13. | | |
| 6.18.14. | | |
| 6.18.15. | | |
| 6.18.16. | | |
| 6.18.17. | | |
| SCHEDULE C – ADDITIONAL ACCESSORIES | | |
| 6.18.18. | | |
| 6.18.19. | | |
| 6.18.20. | | |
| 6.18.21. | | |
| 6.18.22. | | |
| 6.18.23. | | |
| 6.18.24. | | |

| | | | | |
|---|--|--|--|--|
| 6.18.25. | | | | |
| List all items of which the Prices are NOT FIRM, i.e. Effected by Rate of Exchange | | | | |
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| | | | | |
| Applicable Rate of Exchange (On date of Signature) | | | | |
| = R | | | | |

BIDDER'S SIGNATURE:

NAME OF BIDDER / COMPANY:

DATE:

6.19. PRICE SCHEDULES FOR SENSOR FOR WEATHER MEASUREMENT: NET RADIATION.

OFFER TO BE VALID FOR **120 DAYS** FROM THE CLOSING DATE OF BID.

| SCHEDULE A – BASIC UNIT | | |
|--------------------------|--|---|
| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
| 6.19.1. | Sensor for weather measurement: net radiation, complete as specified. | |
| 6.19.2. | a) Data Cable | Normal Cable (per meter) |
| | b) Data Cable | Strengthened Cable (per meter) |
| 6.19.3. | Interfacing to logger | |
| 6.19.4. | Any other accessories required for complete installation: (a) | |
| | (b) | |
| | (c) | |
| | (d) | |
| | (e) | |
| SCHEDULE B – MAINTENANCE | | |
| 6.19.5. | Cost of labour for repair / replacement of: (per hour) <ul style="list-style-type: none"> Items not covered by the guarantee (Listed in Technical Schedules), or Items which have become damaged / defective due to causes for which the manufacturer cannot be held responsible | |
| 6.19.6. | Cost of labour for General Maintenance and/or Back-up on Hardware and/or Software: (per hour) | |
| 6.19.7. | Training at the two venues: (Include traveling, accommodation and meals) <ul style="list-style-type: none"> North-West Province Eastern- or Southern Cape | |
| | | |
| | | |

| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
|-------------------------------------|--|---------------------|
| 6.19.8. | Cost for assistance on installations for the first 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
| | | |
| | | |
| 6.19.9. | Cost for maintenance / assistance on equipment for the second 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
| | | |
| | | |
| 6.19.10. | Cost for maintenance / assistance on equipment for the third 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
| | | |
| | | |
| SCHEDULE B – SPARES | | |
| 6.19.11. | | |
| 6.19.12. | | |
| 6.19.13. | | |
| 6.19.14. | | |
| 6.19.15. | | |
| 6.19.16. | | |
| 6.19.17. | | |
| SCHEDULE C – ADDITIONAL ACCESSORIES | | |
| 6.19.18. | | |
| 6.19.19. | | |
| 6.19.20. | | |
| 6.19.21. | | |
| 6.19.22. | | |
| 6.19.23. | | |
| 6.19.24. | | |

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| 6.19.25. | | | | |
| List all items of which the Prices are NOT FIRM, i.e. Effected by Rate of Exchange | | | | |
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| | | | | |
| Applicable Rate of Exchange (On date of Signature) | | | | |
| = R | | | | |

BIDDER'S SIGNATURE:

NAME OF BIDDER / COMPANY:

DATE:

7. POWER SUPPLY EQUIPMENT

- 7.1. PRICE SCHEDULES FOR BATTERY, SEALED, RECHARGEABLE, VALVE REGULATED LEAD-ACID SOLAR TYPE, 12 VOLT, 120 AH CAPACITY:
OFFER TO BE VALID FOR **120 DAYS** FROM THE CLOSING DATE OF BID.

| SCHEDULE A – BASIC UNIT | | | |
|--|---|--|---------------------|
| ITEM NO. | DESCRIPTION | | RATE (VAT Included) |
| 7.1.1. | Battery, sealed, rechargeable, valve regulated lead-acid solar type, 12 Volt, 120 Ah capacity, complete as specified. | | |
| 7.1.2. | Cable, 2m long, including set of terminal clamps/screws/lugs. | | |
| 7.1.3. | Insulation box. | | |
| 7.1.4. | Any other accessories required for complete installation: | | |
| | (a) | | |
| | (b) | | |
| SCHEDULE B – SPARES | | | |
| 7.1.5. | | | |
| 7.1.6. | | | |
| 7.1.7. | | | |
| SCHEDULE C – ADDITIONAL ACCESSORIES | | | |
| 7.1.8. | | | |
| 7.1.9. | | | |
| 7.1.10. | | | |
| List all items of which the Prices are NOT FIRM, i.e. Effected by Rate of Exchange | | | |
| | | | |
| | | | |
| Applicable Rate of Exchange (On date of Signature) | | | |
| = R | | | |

BIDDER'S SIGNATURE:

NAME OF BIDDER / COMPANY:

DATE:

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- 7.2. PRICE SCHEDULES FOR BATTERY, SEALED, RECHARGEABLE, VALVE REGULATED LEAD-ACID SOLAR TYPE, 12 VOLT, 105 AH CAPACITY:
OFFER TO BE VALID FOR **120 DAYS** FROM THE CLOSING DATE OF BID.

| SCHEDULE A – BASIC UNIT | | | |
|--|---|--|---------------------|
| ITEM NO. | DESCRIPTION | | RATE (VAT Included) |
| 7.2.1. | Battery, sealed, rechargeable, valve regulated lead-acid solar type, 12 Volt, 105 Ah capacity, complete as specified. | | |
| 7.2.2. | Cable, 2m long, including set of terminal clamps/screws/lugs. | | |
| 7.2.3. | Insulation box. | | |
| 7.2.4. | Any other accessories required for complete installation: | | |
| | (a) | | |
| | (b) | | |
| SCHEDULE B – SPARES | | | |
| 7.2.5. | | | |
| 7.2.6. | | | |
| 7.2.7. | | | |
| SCHEDULE C – ADDITIONAL ACCESSORIES | | | |
| 7.2.8. | | | |
| 7.2.9. | | | |
| 7.2.10. | | | |
| List all items of which the Prices are NOT FIRM, i.e. Effected by Rate of Exchange | | | |
| | | | |
| | | | |
| Applicable Rate of Exchange (On date of Signature) | | | |
| = R | | | |

BIDDER'S SIGNATURE:

NAME OF BIDDER / COMPANY:

DATE:

- 7.3. PRICE SCHEDULES FOR BATTERY, SEALED, RECHARGEABLE, LEAD-ACID SOLAR TYPE, 12 VOLT, 40 AH CAPACITY:
OFFER TO BE VALID FOR **120 DAYS** FROM THE CLOSING DATE OF BID.

| SCHEDULE A – BASIC UNIT | | | |
|--|--|--|---------------------|
| ITEM NO. | DESCRIPTION | | RATE (VAT Included) |
| 7.3.1. | Battery, sealed, rechargeable, valve regulated lead-acid solar type, 12 Volt, 40 Ah capacity, complete as specified. | | |
| 7.3.2. | Cable, 2m long, including set of terminal clamps/screws/lugs. | | |
| 7.3.3. | Insulation box. | | |
| 7.3.4. | Any other accessories required for complete installation: | | |
| | (a) | | |
| | (b) | | |
| SCHEDULE B – SPARES | | | |
| 7.3.5. | | | |
| 7.3.6. | | | |
| 7.3.7. | | | |
| SCHEDULE C – ADDITIONAL ACCESSORIES | | | |
| 7.3.8. | | | |
| 7.3.9. | | | |
| 7.3.10. | | | |
| List all items of which the Prices are NOT FIRM, i.e. Effected by Rate of Exchange | | | |
| | | | |
| | | | |
| Applicable Rate of Exchange (On date of Signature) | | | |
| = R | | | |

BIDDER'S SIGNATURE:

NAME OF BIDDER / COMPANY:

DATE:

- 7.4. PRICE SCHEDULES FOR BATTERY, SEALED, RECHARGEABLE, LEAD-ACID SOLAR TYPE, 12 VOLT, 28 AH CAPACITY:
OFFER TO BE VALID FOR **120 DAYS** FROM THE CLOSING DATE OF BID.

| SCHEDULE A – BASIC UNIT | | | |
|--|--|--|---------------------|
| ITEM NO. | DESCRIPTION | | RATE (VAT Included) |
| 7.4.1. | Battery, sealed, rechargeable, valve regulated lead-acid solar type, 12 Volt, 28 Ah capacity, complete as specified. | | |
| 7.4.2. | Cable, 2m long, including set of terminal clamps/screws/lugs. | | |
| 7.4.3. | Insulation box. | | |
| 7.4.4. | Any other accessories required for complete installation: | | |
| | (a) | | |
| | (b) | | |
| SCHEDULE B – SPARES | | | |
| 7.4.5. | | | |
| 7.4.6. | | | |
| 7.4.7. | | | |
| SCHEDULE C – ADDITIONAL ACCESSORIES | | | |
| 7.4.8. | | | |
| 7.4.9. | | | |
| 7.4.10. | | | |
| List all items of which the Prices are NOT FIRM, i.e. Effected by Rate of Exchange | | | |
| | | | |
| | | | |
| Applicable Rate of Exchange (On date of Signature) | | | |
| = R | | | |

BIDDER'S SIGNATURE:

NAME OF BIDDER / COMPANY:

DATE:

- 7.5. PRICE SCHEDULES FOR BATTERY, SEALED, RECHARGEABLE, LEAD-ACID SOLAR TYPE, 12 VOLT, 12 AH CAPACITY:
OFFER TO BE VALID FOR **120 DAYS** FROM THE CLOSING DATE OF BID.

| SCHEDULE A – BASIC UNIT | | | |
|--|--|--|---------------------|
| ITEM NO. | DESCRIPTION | | RATE (VAT Included) |
| 7.5.1. | Battery, sealed, rechargeable, valve regulated lead-acid solar type, 12 Volt, 12 Ah capacity, complete as specified. | | |
| 7.5.2. | Cable, 2m long, including set of terminal clamps/screws/lugs. | | |
| 7.5.3. | Insulation box. | | |
| 7.5.4. | Any other accessories required for complete installation: | | |
| | (a) | | |
| | (b) | | |
| SCHEDULE B – SPARES | | | |
| 7.5.5. | | | |
| 7.5.6. | | | |
| 7.5.7. | | | |
| SCHEDULE C – ADDITIONAL ACCESSORIES | | | |
| 7.5.8. | | | |
| 7.5.9. | | | |
| 7.5.10. | | | |
| List all items of which the Prices are NOT FIRM, i.e. Effected by Rate of Exchange | | | |
| | | | |
| | | | |
| Applicable Rate of Exchange (On date of Signature) | | | |
| = R | | | |

BIDDER'S SIGNATURE:

NAME OF BIDDER / COMPANY:

DATE:

- 7.6. PRICE SCHEDULES FOR BATTERY, SEALED, RECHARGEABLE, LEAD-CRYSTAL SOLAR TYPE, 12 VOLT, 28 AH CAPACITY:
OFFER TO BE VALID FOR **120 DAYS** FROM THE CLOSING DATE OF BID.

| SCHEDULE A – BASIC UNIT | | | |
|--|---|--|---------------------|
| ITEM NO. | DESCRIPTION | | RATE (VAT Included) |
| 7.6.1. | Battery, sealed, rechargeable, lead crystal solar type, 12 Volt, 28 Ah capacity, complete as specified. | | |
| 7.6.2. | Cable, 2m long, including set of terminal clamps/screws/lugs. | | |
| 7.6.3. | Insulation box. | | |
| 7.6.4. | Any other accessories required for complete installation: | | |
| | (a) | | |
| | (b) | | |
| SCHEDULE B – SPARES | | | |
| 7.6.5. | | | |
| 7.6.6. | | | |
| 7.6.7. | | | |
| SCHEDULE C – ADDITIONAL ACCESSORIES | | | |
| 7.6.8. | | | |
| 7.6.9. | | | |
| 7.6.10. | | | |
| List all items of which the Prices are NOT FIRM, i.e. Effected by Rate of Exchange | | | |
| | | | |
| | | | |
| Applicable Rate of Exchange (On date of Signature) | | | |
| = R | | | |

BIDDER'S SIGNATURE:

NAME OF BIDDER / COMPANY:

DATE:

- 7.7. PRICE SCHEDULES FOR BATTERY, SIZE D, LITHIUM-THIONYL CHLORIDE TYPE, 3.6 VOLT, 13 AH CAPACITY:
OFFER TO BE VALID FOR **120 DAYS** FROM THE CLOSING DATE OF BID.

| SCHEDULE A – BASIC UNIT | | | |
|--|--|--|---------------------|
| ITEM NO. | DESCRIPTION | | RATE (VAT Included) |
| 7.7.1. | Battery, size D, Lithium-Thionyl Chloride type, 3.6 Volt, 13 Ah capacity, complete as specified. | | |
| 7.7.2. | Any other accessories required for complete installation: | | |
| | (a) | | |
| | (b) | | |
| SCHEDULE B – SPARES | | | |
| 7.7.3. | | | |
| 7.7.4. | | | |
| 7.7.5. | | | |
| SCHEDULE C – ADDITIONAL ACCESSORIES | | | |
| 7.7.6. | | | |
| 7.7.7. | | | |
| 7.7.8. | | | |
| List all items of which the Prices are NOT FIRM, i.e. Effected by Rate of Exchange | | | |
| | | | |
| | | | |
| Applicable Rate of Exchange (On date of Signature) | | | |
| = R | | | |

BIDDER'S SIGNATURE:

NAME OF BIDDER / COMPANY:

DATE:

- 7.8. PRICE SCHEDULES FOR BATTERY, SIZE D, LITHIUM-THIONYL CHLORIDE TYPE, 3.6 VOLT, 13 AH CAPACITY WITH PCB CONNECTOR, OFFER TO BE VALID FOR **120 DAYS** FROM THE CLOSING DATE OF BID.

| SCHEDULE A – BASIC UNIT | | | |
|--|---|--|---------------------|
| ITEM NO. | DESCRIPTION | | RATE (VAT Included) |
| 7.8.1. | Battery, size D, Lithium-Thionyl Chloride type, 3.6 Volt, 13 Ah capacity with PCB connector, complete as specified. | | |
| 7.8.2. | Any other accessories required for complete installation: | | |
| | (a) | | |
| | (b) | | |
| SCHEDULE B – SPARES | | | |
| 7.8.3. | | | |
| 7.8.4. | | | |
| 7.8.5. | | | |
| SCHEDULE C – ADDITIONAL ACCESSORIES | | | |
| 7.8.6. | | | |
| 7.8.7. | | | |
| 7.8.8. | | | |
| List all items of which the Prices are NOT FIRM, i.e. Effected by Rate of Exchange | | | |
| | | | |
| | | | |
| Applicable Rate of Exchange (On date of Signature) | | | |
| = R | | | |

BIDDER'S SIGNATURE:

NAME OF BIDDER / COMPANY:

DATE:

- 7.9. PRICE SCHEDULES FOR BATTERY, SIZE D, LITHIUM-THIONYL CHLORIDE TYPE, 3.6 VOLT, 13 AH CAPACITY WITH ELP-02V CONNECTOR:
OFFER TO BE VALID FOR **120 DAYS** FROM THE CLOSING DATE OF BID.

| SCHEDULE A – BASIC UNIT | | | |
|--|---|--|---------------------|
| ITEM NO. | DESCRIPTION | | RATE (VAT Included) |
| 7.9.1. | Battery, size D, Lithium-Thionyl Chloride type, 3.6 Volt, 13 Ah capacity with ELP-02V connector, complete as specified. | | |
| 7.9.2. | Any other accessories required for complete installation: | | |
| | (a) | | |
| | (b) | | |
| SCHEDULE B – SPARES | | | |
| 7.9.3. | | | |
| 7.9.4. | | | |
| 7.9.5. | | | |
| SCHEDULE C – ADDITIONAL ACCESSORIES | | | |
| 7.9.6. | | | |
| 7.9.7. | | | |
| 7.9.8. | | | |
| List all items of which the Prices are NOT FIRM, i.e. Effected by Rate of Exchange | | | |
| | | | |
| | | | |
| Applicable Rate of Exchange (On date of Signature) | | | |
| = R | | | |

BIDDER'S SIGNATURE:

NAME OF BIDDER / COMPANY:

DATE:

- 7.10. PRICE SCHEDULES FOR BATTERY, SIZE D, LITHIUM-THIONYL CHLORIDE TYPE, 3.6 VOLT, 26 AH CAPACITY WITH ELP-02V CONNECTOR:
OFFER TO BE VALID FOR **120 DAYS** FROM THE CLOSING DATE OF BID.

| SCHEDULE A – BASIC UNIT | | | |
|--|---|--|---------------------|
| ITEM NO. | DESCRIPTION | | RATE (VAT Included) |
| 7.10.1. | Battery, size D, Lithium-Thionyl Chloride type, 3.6 Volt, 26 Ah capacity with ELP-02V connector, complete as specified. | | |
| 7.10.2. | Any other accessories required for complete installation: | | |
| | (a) | | |
| | (b) | | |
| SCHEDULE B – SPARES | | | |
| 7.10.3. | | | |
| 7.10.4. | | | |
| 7.10.5. | | | |
| SCHEDULE C – ADDITIONAL ACCESSORIES | | | |
| 7.10.6. | | | |
| 7.10.7. | | | |
| 7.10.8. | | | |
| List all items of which the Prices are NOT FIRM, i.e. Effected by Rate of Exchange | | | |
| | | | |
| | | | |
| Applicable Rate of Exchange (On date of Signature) | | | |
| = R | | | |

BIDDER'S SIGNATURE:

NAME OF BIDDER / COMPANY:

DATE:

7.11. PRICE SCHEDULES FOR BATTERY, SIZE AA, LITHIUM-THIONYL CHLORIDE TYPE, 3.6 VOLT, 2.6 AH CAPACITY
OFFER TO BE VALID FOR **120 DAYS** FROM THE CLOSING DATE OF BID.

| SCHEDULE A – BASIC UNIT | | | |
|--|--|--|---------------------|
| ITEM NO. | DESCRIPTION | | RATE (VAT Included) |
| 7.11.1. | Battery, size AA, Lithium-Thionyl Chloride type, 3.6 Volt, 2.6 Ah capacity, complete as specified. | | |
| 7.11.2. | Any other accessories required for complete installation: | | |
| | (a) | | |
| | (b) | | |
| SCHEDULE B – SPARES | | | |
| 7.11.3. | | | |
| 7.11.4. | | | |
| 7.11.5. | | | |
| SCHEDULE C – ADDITIONAL ACCESSORIES | | | |
| 7.11.6. | | | |
| 7.11.7. | | | |
| 7.11.8. | | | |
| List all items of which the Prices are NOT FIRM, i.e. Effected by Rate of Exchange | | | |
| | | | |
| | | | |
| Applicable Rate of Exchange (On date of Signature) | | | |
| = R | | | |

BIDDER'S SIGNATURE:

NAME OF BIDDER / COMPANY:

DATE:

7.12. PRICE SCHEDULES FOR BATTERY, SIZE D, TWO CELL, LITHIUM-THIONYL CHLORIDE TYPE, 3.9 VOLT, 38 AH CAPACITY WITH ATX CONNECTOR, OFFER TO BE VALID FOR **120 DAYS** FROM THE CLOSING DATE OF BID.

| SCHEDULE A – BASIC UNIT | | | |
|--|---|--|---------------------|
| ITEM NO. | DESCRIPTION | | RATE (VAT Included) |
| 7.12.1. | Battery, size D, two cell, Lithium-Thionyl Chloride type, 3.9 Volt, 38 Ah capacity with ATX connector, complete as specified. | | |
| 7.12.2. | Any other accessories required for complete installation: | | |
| | (a) | | |
| | (b) | | |
| SCHEDULE B – SPARES | | | |
| 7.12.3. | | | |
| 7.12.4. | | | |
| 7.12.5. | | | |
| SCHEDULE C – ADDITIONAL ACCESSORIES | | | |
| 7.12.6. | | | |
| 7.12.7. | | | |
| 7.12.8. | | | |
| List all items of which the Prices are NOT FIRM, i.e. Effected by Rate of Exchange | | | |
| | | | |
| | | | |
| Applicable Rate of Exchange (On date of Signature) | | | |
| = R | | | |

BIDDER'S SIGNATURE:

NAME OF BIDDER / COMPANY:

DATE:

7.13. PRICE SCHEDULES FOR BATTERY, SIZE A, TADIRAN LITHIUM TYPE, 3.9 VOLT, 1.55 AH CAPACITY WITH TAGGED HYBRID LAYER CAPACITOR POLARISED PINS, OFFER TO BE VALID FOR **120 DAYS** FROM THE CLOSING DATE OF BID.

| SCHEDULE A – BASIC UNIT | | | |
|--|---|--|---------------------|
| ITEM NO. | DESCRIPTION | | RATE (VAT Included) |
| 7.13.1. | Battery, size A, Tadiran Lithium type, 3.9 Volt, 1.55 Ah capacity with tagged hybrid layer capacitor polarised pins, complete as specified. | | |
| 7.13.2. | Any other accessories required for complete installation: | | |
| | (a) | | |
| | (b) | | |
| SCHEDULE B – SPARES | | | |
| 7.13.3. | | | |
| 7.13.4. | | | |
| 7.13.5. | | | |
| SCHEDULE C – ADDITIONAL ACCESSORIES | | | |
| 7.13.6. | | | |
| 7.13.7. | | | |
| 7.13.8. | | | |
| List all items of which the Prices are NOT FIRM, i.e. Effected by Rate of Exchange | | | |
| | | | |
| | | | |
| Applicable Rate of Exchange (On date of Signature) | | | |
| = R | | | |

BIDDER'S SIGNATURE:

NAME OF BIDDER / COMPANY:

DATE:

7.14. PRICE SCHEDULES FOR BATTERY, SIZE C, ALKALINE TYPE, 1.5 VOLT,
OFFER TO BE VALID FOR **120 DAYS** FROM THE CLOSING DATE OF BID.

| SCHEDULE A – BASIC UNIT | | | |
|--|--|--|---------------------|
| ITEM NO. | DESCRIPTION | | RATE (VAT Included) |
| 7.14.1. | Battery, size C, Alkaline type, 1.5 Volt, complete as specified. | | |
| 7.14.2. | Any other accessories required for complete installation: | | |
| | (a) | | |
| | (b) | | |
| SCHEDULE B – SPARES | | | |
| 7.14.3. | | | |
| 7.14.4. | | | |
| 7.14.5. | | | |
| SCHEDULE C – ADDITIONAL ACCESSORIES | | | |
| 7.14.6. | | | |
| 7.14.7. | | | |
| 7.14.8. | | | |
| List all items of which the Prices are NOT FIRM, i.e. Effected by Rate of Exchange | | | |
| | | | |
| | | | |
| Applicable Rate of Exchange (On date of Signature) | | | |
| = R | | | |

BIDDER'S SIGNATURE:

NAME OF BIDDER / COMPANY:

DATE:

7.15. PRICE SCHEDULES FOR BATTERY, SIZE AA, ALKALINE TYPE, 1.5 VOLT,
OFFER TO BE VALID FOR **120 DAYS** FROM THE CLOSING DATE OF BID.

| SCHEDULE A – BASIC UNIT | | | |
|--|---|--|---------------------|
| ITEM NO. | DESCRIPTION | | RATE (VAT Included) |
| 7.15.1. | Battery, size AA, Alkaline Type, 1.5 Volt, complete as specified. | | |
| 7.15.2. | Any other accessories required for complete installation: | | |
| | (a) | | |
| | (b) | | |
| SCHEDULE B – SPARES | | | |
| 7.15.3. | | | |
| 7.15.4. | | | |
| 7.15.5. | | | |
| SCHEDULE C – ADDITIONAL ACCESSORIES | | | |
| 7.15.6. | | | |
| 7.15.7. | | | |
| 7.15.8. | | | |
| List all items of which the Prices are NOT FIRM, i.e. Effected by Rate of Exchange | | | |
| | | | |
| | | | |
| Applicable Rate of Exchange (On date of Signature) | | | |
| = R | | | |

BIDDER'S SIGNATURE:

NAME OF BIDDER / COMPANY:

DATE:

7.16. PRICE SCHEDULES FOR BATTERY, SIZE AAA, ALKALINE TYPE, 1.5 VOLT, OFFER TO BE VALID FOR **120 DAYS** FROM THE CLOSING DATE OF BID.

| SCHEDULE A – BASIC UNIT | | | |
|--|--|--|---------------------|
| ITEM NO. | DESCRIPTION | | RATE (VAT Included) |
| 7.16.1. | Battery, size AAA, Alkaline Type, 1.5 Volt, complete as specified. | | |
| 7.16.2. | Any other accessories required for complete installation: | | |
| | (a) | | |
| | (b) | | |
| SCHEDULE B – SPARES | | | |
| 7.16.3. | | | |
| 7.16.4. | | | |
| 7.16.5. | | | |
| SCHEDULE C – ADDITIONAL ACCESSORIES | | | |
| 7.16.6. | | | |
| 7.16.7. | | | |
| 7.16.8. | | | |
| List all items of which the Prices are NOT FIRM, i.e. Effected by Rate of Exchange | | | |
| | | | |
| | | | |
| Applicable Rate of Exchange (On date of Signature) | | | |
| = R | | | |

BIDDER'S SIGNATURE:

NAME OF BIDDER / COMPANY:

DATE:

7.17. PRICE SCHEDULES FOR SOLAR PANELS, 12 VOLT, CRYSTALLINE
OFFER TO BE VALID FOR **120 DAYS** FROM THE CLOSING DATE OF BID.

| SCHEDULE A – BASIC UNIT | | |
|--|--|---------------------|
| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
| 7.17.1. | Solar Panel 1: 12 Volt, Crystalline, complete as specified: 10 Watt. | |
| 7.17.2. | Solar Panel 2: 12 Volt, Crystalline, complete as specified: 20 Watt. | |
| 7.17.3. | Solar Panel 3: 12 Volt, Crystalline, complete as specified: 40 Watt. | |
| 7.17.4. | Solar Panel 4: 12 Volt, Crystalline, complete as specified: 50 Watt. | |
| 7.17.5. | Solar Panel 5: 12 Volt, Crystalline, complete as specified: 80 Watt. | |
| 7.17.6. | Solar Panel 6, 12 Volt, Crystalline, complete as specified: 32 Watt. | |
| 7.17.7. | Adjustable (between 0 and 45 degrees) horizontal mounting bracket: | |
| 7.17.8. | Any other accessories required for complete installation: | |
| | (a) | |
| | (b) | |
| SCHEDULE B – SPARES | | |
| 7.17.9. | | |
| 7.17.10. | | |
| 7.17.11. | | |
| SCHEDULE C – ADDITIONAL ACCESSORIES | | |
| 7.17.12. | | |
| 7.17.13. | | |
| 7.17.14. | | |
| List all items of which the Prices are NOT FIRM, i.e. Effected by Rate of Exchange | | |

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| | | | |
| Applicable Rate of Exchange (On date of Signature) | | | |
| = R | | | |

BIDDER'S SIGNATURE:

NAME OF BIDDER / COMPANY:

DATE:

7.18. PRICE SCHEDULES FOR SOLAR CHARGE CONTROLLER:
OFFER TO BE VALID FOR **120 DAYS** FROM THE CLOSING DATE OF BID.

| SCHEDULE A – BASIC UNIT | | | |
|--|---|--|---------------------|
| ITEM NO. | DESCRIPTION | | RATE (VAT Included) |
| 7.18.1. | Solar Charge Controller 1, complete as specified: 4 Amp. | | |
| 7.18.2. | Solar Charge Controller 2, complete as specified: 8 Amp. | | |
| 7.18.3. | Solar Charge Controller 3, complete as specified: 15 Amp. | | |
| 7.18.4. | Any other accessories required for complete installation: | | |
| | (a) | | |
| | (b) | | |
| SCHEDULE B – SPARES | | | |
| 7.18.5. | | | |
| 7.18.6. | | | |
| 7.18.7. | | | |
| SCHEDULE C – ADDITIONAL ACCESSORIES | | | |
| 7.18.8. | | | |
| 7.18.9. | | | |
| 7.18.10. | | | |
| List all items of which the Prices are NOT FIRM, i.e. Effected by Rate of Exchange | | | |
| | | | |
| | | | |
| Applicable Rate of Exchange (On date of Signature) | | | |
| = R | | | |

BIDDER'S SIGNATURE:

NAME OF BIDDER / COMPANY:

DATE:

7.19. PRICE SCHEDULES FOR POWER CONTROL UNIT OR MAINS TRANSFORMER:
OFFER TO BE VALID FOR **120 DAYS** FROM THE CLOSING DATE OF BID.

| SCHEDULE A – BASIC UNIT | | | |
|--|---|--|---------------------|
| ITEM NO. | DESCRIPTION | | RATE (VAT Included) |
| 7.19.1. | Power Control Unit or Mains Transformer, complete as specified. | | |
| 7.19.2. | Any other accessories required for complete installation: | | |
| | (a) | | |
| | (b) | | |
| SCHEDULE B – SPARES | | | |
| 7.19.3. | | | |
| 7.19.4. | | | |
| 7.19.5. | | | |
| SCHEDULE C – ADDITIONAL ACCESSORIES | | | |
| 7.19.6. | | | |
| 7.19.7. | | | |
| 7.19.8. | | | |
| List all items of which the Prices are NOT FIRM, i.e. Effected by Rate of Exchange | | | |
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| | | | |
| Applicable Rate of Exchange (On date of Signature) | | | |
| = R | | | |

BIDDER'S SIGNATURE:

NAME OF BIDDER / COMPANY:

DATE:

7.20. PRICE SCHEDULES FOR BATTERY CHARGER, 12 VOLT, AUTOMATIC, 8 STAGE INTELLIGENT:

OFFER TO BE VALID FOR **120 DAYS** FROM THE CLOSING DATE OF BID.

| SCHEDULE A – BASIC UNIT | | | |
|--|--|--|---------------------|
| ITEM NO. | DESCRIPTION | | RATE (VAT Included) |
| 7.20.1. | Battery charger, 12 Volt, automatic, 8 stage intelligent, complete as specified. | | |
| 7.20.2. | Charge Cable: 4 m | | |
| 7.20.3. | Any other accessories required for complete installation: | | |
| | (a) | | |
| | (b) | | |
| SCHEDULE B – SPARES | | | |
| 7.20.4. | | | |
| 7.20.5. | | | |
| 7.20.6. | | | |
| SCHEDULE C – ADDITIONAL ACCESSORIES | | | |
| 7.20.7. | | | |
| 7.20.8. | | | |
| 7.20.9. | | | |
| List all items of which the Prices are NOT FIRM, i.e. Effected by Rate of Exchange | | | |
| | | | |
| | | | |
| Applicable Rate of Exchange (On date of Signature) | | | |
| = R | | | |

BIDDER'S SIGNATURE:

NAME OF BIDDER / COMPANY:

DATE:

B. HANDHELD ACOUSTIC DOPPLER CURRENT METERS

1. GENERAL: PRICE SCHEDULES

1.1. COMPLETION OF SCHEDULES:

- g. The Bidder will specify any accessories, which he/she regards as technically essential for the complete functioning of the instrumentation and which he/she considers as having to be omitted from the schedules. (**Price Schedule A**) The letters “**N/A**” should be entered in the appropriate columns if the Bidder considers the offered equipment to be complete.
- h. Should any item requested in the price schedule already form part of the main item, the Bidder shall mark these columns by filling in the word “**INCLUDED**”.
- i. The word “**NO OFFER**” should be entered in the appropriate columns if the Bidder cannot offer that specific item.
- j. All equipment spares, services, etc. will be listed in **Price Schedule B** for each main item.
- k. Any additional accessories, i.e. Power Supplies, Enclosures, etc., will be listed in **Price Schedule C** for each item.
- l. Should the Price Schedules in this Section not be adequate, additional Price Schedules should be compiled by the Bidder and included in his/her Covering Letter. Please refer clearly on the Price Schedule/s in this Section that additional Price Schedules are attached in your Covering Letter.

Failure to comply with the above-mentioned will invalidate the tender offer.

1.2. VALUE ADDED TAX AND ROUNDING OFF:

All rates shown will **include value added tax** and each item's price should be rounded off to the nearest **R 1.00**.

1.3. PRICE ESCALATION:

No price escalation for any item will be allowed.

1.4. QUANTITIES:

- a. No guarantee can be given to the Bidder with regard to the quantity of each item required.
- b. All quantities will be indicated on official orders from the various Regional Offices.

1.5. DELIVERY:

All delivery costs will be paid by the relevant Regional Offices, except in the case where the delivery address is located within a radius of 150 km from the Contactor's office/stores.

BIDDER'S SIGNATURE:

NAME OF BIDDER / COMPANY:

DATE:

**2. PRICE SCHEDULES FOR HANDHELD ACOUSTIC DOPPLER INSTRUMENT 1:
OFFER TO BE VALID FOR 120 DAYS FROM THE CLOSING DATE OF BID.**

| SCHEDULE A – BASIC UNIT | | |
|---------------------------------|--|----------------------------|
| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
| 2.1. | Acoustic Doppler Instrument 1, current meter / sensor / probe. | |
| 2.2. | Acoustic Doppler Instrument 1, handheld interface / counter unit. | |
| 2.3. | Bi-directional Communication Serial Cable (Data Logger ⇒ Laptop / Tablet or Smartphone) with standard RS 232 / USB converter. | |
| 2.4. | Any other accessories required for complete installation: | |
| | (a) | |
| | (b) | |
| | (c) | |
| | (d) | |
| | (e) | |
| 2.5. | Software package required for the operation of the Acoustic Doppler Instrument. | |
| SCHEDULE B – MAINTENANCE | | |
| 2.6. | Cost of labour for repair / replacement of: (per hour) <ul style="list-style-type: none"> Items not covered by the guarantee (Listed in Technical Schedules), or Items which have become damaged / defective due to causes for which the manufacturer cannot be held responsible | |
| 2.7. | Cost of labour for General Maintenance and/or Back-up on Hardware and/or Software: (per hour) | |
| 2.8. | Training at the two venues: (Include traveling, accommodation and meals) <ul style="list-style-type: none"> North-West Province Eastern- or Southern Cape | |
| | | |
| | | |

| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
|-------------------------------------|--|---------------------|
| 2.9. | Cost for assistance on installations for the first 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
| | | |
| | | |
| 2.10. | Cost for maintenance / assistance on equipment for the second 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
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| | | |
| 2.11. | Cost for maintenance / assistance on equipment for the third 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
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| | | |
| SCHEDULE B – SPARES | | |
| 2.12. | | |
| 2.13. | | |
| 2.14. | | |
| 2.15. | | |
| 2.16. | | |
| 2.17. | | |
| 2.18. | | |
| SCHEDULE C – ADDITIONAL ACCESSORIES | | |
| 2.19. | | |
| 2.20. | | |
| 2.21. | | |
| 2.22. | | |
| 2.23. | | |
| 2.24. | | |
| 2.25. | | |

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| 2.26. | | |
| 2.27. | | |
| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
| 2.28. | | |
| 2.29. | | |
| 2.30. | | |
| 2.31. | | |
| 2.32. | | |
| 2.33. | | |
| List all items of which the Prices are NOT FIRM, i.e. Effected by Rate of Exchange | | |
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| Applicable Rate of Exchange (On date of Signature) | | |
| = R | | |

BIDDER’S SIGNATURE:

NAME OF BIDDER / COMPANY:

DATE:

3. PRICE SCHEDULES FOR HANDHELD ACOUSTIC DOPPLER INSTRUMENT 2:
OFFER TO BE VALID FOR **120 DAYS** FROM THE CLOSING DATE OF BID.

| SCHEDULE A – BASIC UNIT | | |
|---------------------------------|--|----------------------------|
| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
| 3.1. | Acoustic Doppler Instrument 2, current meter / sensor / probe. | |
| 3.2. | Acoustic Doppler Instrument 2, 20mm diameter, non-corrosive rod with centimetre graduation marks. | |
| 3.3. | Acoustic Doppler Instrument 2, handheld interface / counter unit. | |
| 3.4. | Bi-directional Communication Serial Cable (Data Logger ⇒ Laptop / Tablet or Smartphone) with standard RS 232 / USB converter. | |
| 3.5. | Any other accessories required for complete installation: | |
| | (a) | |
| | (b) | |
| | (c) | |
| | (d) | |
| | (e) | |
| 3.6. | Software package required for the operation of the Acoustic Doppler Instrument. | |
| SCHEDULE B – MAINTENANCE | | |
| 3.7. | Cost of labour for repair / replacement of: (per hour) <ul style="list-style-type: none"> Items not covered by the guarantee (Listed in Technical Schedules), or Items which have become damaged / defective due to causes for which the manufacturer cannot be held responsible | |
| 3.8. | Cost of labour for General Maintenance and/or Back-up on Hardware and/or Software: (per hour) | |
| 3.9. | Training at the two venues: (Include traveling, accommodation and meals) <ul style="list-style-type: none"> North-West Province Eastern- or Southern Cape | |
| | | |
| | | |

| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
|-------------------------------------|--|---------------------|
| 3.10. | Cost for assistance on installations for the first 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
| | | |
| | | |
| 3.11. | Cost for maintenance / assistance on equipment for the second 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
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| | | |
| 3.12. | Cost for maintenance / assistance on equipment for the third 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
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| | | |
| SCHEDULE B – SPARES | | |
| 3.13. | | |
| 3.14. | | |
| 3.15. | | |
| 3.16. | | |
| 3.17. | | |
| 3.18. | | |
| 3.19. | | |
| SCHEDULE C – ADDITIONAL ACCESSORIES | | |
| 3.20. | | |
| 3.21. | | |
| 3.22. | | |
| 3.23. | | |
| 3.24. | | |
| 3.25. | | |
| 3.26. | | |

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| 3.27. | | |
| 3.28. | | |
| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
| 3.29. | | |
| 3.30. | | |
| 3.31. | | |
| 3.32. | | |
| 3.33. | | |
| 3.34. | | |
| List all items of which the Prices are NOT FIRM, i.e. Effected by Rate of Exchange | | |
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| Applicable Rate of Exchange (On date of Signature) | | |
| = R | | |

BIDDER’S SIGNATURE:

NAME OF BIDDER / COMPANY:

DATE:

C. ACOUSTIC DOPPLER CURRENT PROFILING SYSTEMS

1. GENERAL: PRICE SCHEDULES

1.1. COMPLETION OF SCHEDULES:

- a. The Bidder will specify any accessories, which he/she regards as technically essential for the complete functioning of the instrumentation and which he/she considers as having to be omitted from the schedules. (**Price Schedule A**) The letters “**N/A**” should be entered in the appropriate columns if the Bidder considers the offered equipment to be complete.
- b. Should any item requested in the price schedule already form part of the main item, the Bidder shall mark these columns by filling in the word “**INCLUDED**”.
- c. The word “**NO OFFER**” should be entered in the appropriate columns if the Bidder cannot offer that specific item.
- d. All equipment spares, services, etc. will be listed in **Price Schedule B** for each main item.
- e. Any additional accessories, i.e. Power Supplies, Enclosures, etc., will be listed in **Price Schedule C** for each item.
- f. Should the Price Schedules in this Section not be adequate, additional Price Schedules should be compiled by the Bidder and included in his/her Covering Letter. Please refer clearly on the Price Schedule/s in this Section that additional Price Schedules are attached in your Covering Letter.

Failure to comply with the above-mentioned will invalidate the tender offer.

1.2. VALUE ADDED TAX AND ROUNDING OFF:

All rates shown will **include value added tax** and each item's price should be rounded off to the nearest **R 1.00**.

1.3. PRICE ESCALATION:

No price escalation for any item will be allowed.

1.4. QUANTITIES:

- a. No guarantee can be given to the Bidder with regard to the quantity of each item required.
- b. All quantities will be indicated on official orders from the various Regional Offices.

1.5. DELIVERY:

All delivery costs will be paid by the relevant Regional Offices, except in the case where the delivery address is located within a radius of 150 km from the Contactor's office/stores.

BIDDER'S SIGNATURE:

NAME OF BIDDER / COMPANY:

DATE:

**2. PRICE SCHEDULES FOR ACOUSTIC DOPPLER CURRENT PROFILER 1;
OFFER TO BE VALID FOR 120 DAYS FROM THE CLOSING DATE OF BID.**

| SCHEDULE A – BASIC UNIT | | |
|---------------------------------|--|----------------------------|
| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
| 2.1. | Acoustic Doppler Current Profiler 1: Carrying Vessel, complete as specified. | |
| 2.2. | Acoustic Doppler Current Profiler 1, complete as specified. | |
| 2.3. | Acoustic Doppler Current Profiler 1: Power Supply, complete as specified. | |
| 2.4. | Acoustic Doppler Current Profiler 1: Communication, complete as specified. | |
| 2.5. | Acoustic Doppler Current Profiler 1: Data receiver, complete as specified. | |
| 2.6. | Bi-directional Communication Serial Cable (Data Logger ⇒ Laptop / Tablet or Smartphone) with standard RS 232 / USB converter. | |
| 2.7. | Any other accessories required for complete installation: | |
| | (a) | |
| | (b) | |
| | (c) | |
| | (d) | |
| | (e) | |
| 2.8. | Software package required for the operation of the Acoustic Doppler Instrument. | |
| SCHEDULE B – MAINTENANCE | | |
| 2.9. | Cost of labour for repair / replacement of: (per hour) <ul style="list-style-type: none"> Items not covered by the guarantee (Listed in Technical Schedules), or Items which have become damaged / defective due to causes for which the manufacturer cannot be held responsible | |
| 2.10. | Cost of labour for General Maintenance and/or Back-up on Hardware and/or Software: (per hour) | |
| 2.11. | Training at the two venues: (Include traveling, accommodation and meals) <ul style="list-style-type: none"> North-West Province | |

| | <ul style="list-style-type: none">• Eastern- or Southern Cape | |
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| | | |
| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
| 2.12. | Cost for assistance on installations for the first 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
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| 2.13. | Cost for maintenance / assistance on equipment for the second 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
| | | |
| | | |
| 2.14. | Cost for maintenance / assistance on equipment for the third 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
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| SCHEDULE B – SPARES | | |
| 2.15. | | |
| 2.16. | | |
| 2.17. | | |
| 2.18. | | |
| 2.19. | | |
| 2.20. | | |
| 2.21. | | |
| SCHEDULE C – ADDITIONAL ACCESSORIES | | |
| 2.22. | | |
| 2.23. | | |
| 2.24. | | |
| 2.25. | | |
| 2.26. | | |

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| 2.27. | | |
| 2.28. | | |
| 2.29. | | |
| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
| 2.30. | | |
| 2.31. | | |
| 2.32. | | |
| 2.33. | | |
| 2.34. | | |
| 2.35. | | |
| List all items of which the Prices are NOT FIRM, i.e. Effected by Rate of Exchange | | |
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| Applicable Rate of Exchange (On date of Signature) | | |
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BIDDER'S SIGNATURE:

NAME OF BIDDER / COMPANY:

DATE:

**3. PRICE SCHEDULES FOR ACOUSTIC DOPPLER CURRENT PROFILER 2;
OFFER TO BE VALID FOR 120 DAYS FROM THE CLOSING DATE OF BID.**

| SCHEDULE A – BASIC UNIT | | |
|---------------------------------|--|----------------------------|
| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
| 3.1. | Acoustic Doppler Current Profiler 2: Carrying Vessel, complete as specified. | |
| 3.2. | Acoustic Doppler Current Profiler 2, complete as specified. | |
| 3.3. | Acoustic Doppler Current Profiler 2: Power Supply, complete as specified. | |
| 3.4. | Acoustic Doppler Current Profiler 2: Communication, complete as specified. | |
| 3.5. | Acoustic Doppler Current Profiler 2: Data receiver, complete as specified. | |
| 3.6. | Bi-directional Communication Serial Cable (Data Logger ⇒ Laptop / Tablet or Smartphone) with standard RS 232 / USB converter. | |
| 3.7. | Any other accessories required for complete installation: | |
| | (a) | |
| | (b) | |
| | (c) | |
| | (d) | |
| | (e) | |
| 3.8. | Software package required for the operation of the Acoustic Doppler Instrument. | |
| SCHEDULE B – MAINTENANCE | | |
| 3.9. | Cost of labour for repair / replacement of: (per hour) <ul style="list-style-type: none"> Items not covered by the guarantee (Listed in Technical Schedules), or Items which have become damaged / defective due to causes for which the manufacturer cannot be held responsible | |
| 3.10. | Cost of labour for General Maintenance and/or Back-up on Hardware and/or Software: (per hour) | |
| 3.11. | Training at the two venues: (Include traveling, accommodation and meals) <ul style="list-style-type: none"> North-West Province | |

| | <ul style="list-style-type: none">• Eastern- or Southern Cape | |
|-------------------------------------|--|---------------------|
| | | |
| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
| 3.12. | Cost for assistance on installations for the first 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
| | | |
| | | |
| 3.13. | Cost for maintenance / assistance on equipment for the second 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
| | | |
| | | |
| 3.14. | Cost for maintenance / assistance on equipment for the third 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
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| | | |
| SCHEDULE B – SPARES | | |
| 3.15. | | |
| 3.16. | | |
| 3.17. | | |
| 3.18. | | |
| 3.19. | | |
| 3.20. | | |
| 3.21. | | |
| SCHEDULE C – ADDITIONAL ACCESSORIES | | |
| 3.22. | | |
| 3.23. | | |
| 3.24. | | |
| 3.25. | | |
| 3.26. | | |

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| 3.27. | | |
| 3.28. | | |
| 3.29. | | |
| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
| 3.30. | | |
| 3.31. | | |
| 3.32. | | |
| 3.33. | | |
| 3.34. | | |
| 3.35. | | |
| List all items of which the Prices are NOT FIRM, i.e. Effected by Rate of Exchange | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| Applicable Rate of Exchange (On date of Signature) | | |
| = R | | |

BIDDER'S SIGNATURE:

NAME OF BIDDER / COMPANY:

DATE:

4. PRICE SCHEDULES FOR ACOUSTIC DOPPLER CURRENT PROFILER 3.
OFFER TO BE VALID FOR 120 DAYS FROM THE CLOSING DATE OF BID.

| SCHEDULE A – BASIC UNIT | | |
|---------------------------------|--|----------------------------|
| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
| 4.1. | Acoustic Doppler Current Profiler 3: Carrying Vessel, complete as specified. | |
| 4.2. | Acoustic Doppler Current Profiler 3, complete as specified. | |
| 4.3. | Acoustic Doppler Current Profiler 3: Power Supply, complete as specified. | |
| 4.4. | Acoustic Doppler Current Profiler 3: Communication-, Cable- and Connector, complete as specified. | |
| 4.5. | Acoustic Doppler Current Profiler 3: User Interface / Software complete as specified. | |
| 4.6. | Acoustic Doppler Current Profiler 3: Application Software, complete as specified. | |
| 4.7. | Acoustic Doppler Current Profiler 3: Global Positioning System, complete as specified. | |
| 4.8. | Bi-directional Communication Serial Cable (Data Logger ⇒ Laptop / Tablet or Smartphone) with standard RS 232 / USB converter. | |
| 4.9. | Any other accessories required for complete installation: | |
| | (a) | |
| | (b) | |
| | (c) | |
| | (d) | |
| | (e) | |
| 4.10. | Software package required for the operation of the Acoustic Doppler Instrument. | |
| SCHEDULE B – MAINTENANCE | | |
| 4.11. | Cost of labour for repair / replacement of: (per hour) <ul style="list-style-type: none"> • Items not covered by the guarantee (Listed in Technical Schedules), or • Items which have become damaged / defective due to causes for which the manufacturer cannot be held responsible | |

| 4.12. | Cost of labour for General Maintenance and/or Back-up on Hardware and/or Software: (per hour) | |
|-------------------------------------|--|---------------------|
| 4.13. | Training at the two venues: (Include traveling, accommodation and meals) <ul style="list-style-type: none">• North-West Province• Eastern- or Southern Cape | |
| | | |
| | | |
| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
| 4.14. | Cost for assistance on installations for the first 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
| | | |
| | | |
| 4.15. | Cost for maintenance / assistance on equipment for the second 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
| | | |
| | | |
| 4.16. | Cost for maintenance / assistance on equipment for the third 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
| | | |
| | | |
| SCHEDULE B – SPARES | | |
| 4.17. | | |
| 4.18. | | |
| 4.19. | | |
| 4.20. | | |
| 4.21. | | |
| 4.22. | | |
| 4.23. | | |
| SCHEDULE C – ADDITIONAL ACCESSORIES | | |
| 4.24. | | |

| | | |
|---|--------------------|----------------------------|
| 4.25. | | |
| 4.26. | | |
| 4.27. | | |
| 4.28. | | |
| 4.29. | | |
| 4.30. | | |
| 4.31. | | |
| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
| 4.32. | | |
| 4.33. | | |
| 4.34. | | |
| 4.35. | | |
| 4.36. | | |
| 4.37. | | |
| List all items of which the Prices are NOT FIRM, i.e. Effected by Rate of Exchange | | |
| | | |
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| | | |
| Applicable Rate of Exchange (On date of Signature) | | |
| = R | | |

BIDDER'S SIGNATURE:

NAME OF BIDDER / COMPANY:

DATE:

5. PRICE SCHEDULES FOR ACOUSTIC DOPPLER CURRENT PROFILER 4.
OFFER TO BE VALID FOR 120 DAYS FROM THE CLOSING DATE OF BID.

| SCHEDULE A – BASIC UNIT | | |
|---------------------------------|--|----------------------------|
| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
| 5.1. | Acoustic Doppler Current Profiler 4: Carrying Vessel, complete as specified. | |
| 5.2. | Acoustic Doppler Current Profiler 4, complete as specified. | |
| 5.3. | Acoustic Doppler Current Profiler 4: Power Supply, complete as specified. | |
| 5.4. | Acoustic Doppler Current Profiler 4: Communication-, Cable- and Connector, complete as specified. | |
| 5.5. | Acoustic Doppler Current Profiler 4: User Interface / Software complete as specified. | |
| 5.6. | Acoustic Doppler Current Profiler 4: Application Software, complete as specified. | |
| 5.7. | Acoustic Doppler Current Profiler 4: Global Positioning System, complete as specified. | |
| 5.8. | Bi-directional Communication Serial Cable (Data Logger ⇒ Laptop / Tablet or Smartphone) with standard RS 232 / USB converter. | |
| 5.9. | Any other accessories required for complete installation: | |
| | (a) | |
| | (b) | |
| | (c) | |
| | (d) | |
| | (e) | |
| 5.10. | Software package required for the operation of the Acoustic Doppler Instrument. | |
| SCHEDULE B – MAINTENANCE | | |
| 5.11. | Cost of labour for repair / replacement of: (per hour) <ul style="list-style-type: none"> Items not covered by the guarantee (Listed in Technical Schedules), or Items which have become damaged / defective due to causes for which the manufacturer cannot be held responsible | |

| 5.12. | Cost of labour for General Maintenance and/or Back-up on Hardware and/or Software: (per hour) | |
|-------------------------------------|--|---------------------|
| 5.13. | Training at the two venues: (Include traveling, accommodation and meals) <ul style="list-style-type: none">• North-West Province• Eastern- or Southern Cape | |
| | | |
| | | |
| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
| 5.14. | Cost for assistance on installations for the first 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
| | | |
| | | |
| 5.15. | Cost for maintenance / assistance on equipment for the second 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
| | | |
| | | |
| 5.16. | Cost for maintenance / assistance on equipment for the third 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
| | | |
| | | |
| SCHEDULE B – SPARES | | |
| 5.17. | | |
| 5.18. | | |
| 5.19. | | |
| 5.20. | | |
| 5.21. | | |
| 5.22. | | |
| 5.23. | | |
| SCHEDULE C – ADDITIONAL ACCESSORIES | | |
| 5.24. | | |

| 5.25. | | |
|--|-------------|---------------------|
| 5.26. | | |
| 5.27. | | |
| 5.28. | | |
| 5.29. | | |
| 5.30. | | |
| 5.31. | | |
| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
| 5.32. | | |
| 5.33. | | |
| 5.34. | | |
| 5.35. | | |
| 5.36. | | |
| 5.37. | | |
| List all items of which the Prices are NOT FIRM, i.e. Effected by Rate of Exchange | | |
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| | | |
| | | |
| | | |
| | | |
| Applicable Rate of Exchange (On date of Signature) | | |
| = R | | |

BIDDER'S SIGNATURE:

NAME OF BIDDER / COMPANY:

DATE:

D. VANDAL RESISTANT EQUIPMENT HOUSING;

1. **GENERAL: PRICE SCHEDULES**

1.1. COMPLETION OF SCHEDULES:

- a. The Bidder will specify any accessories, which he/she regards as technically essential for the complete functioning of the instrumentation and which he/she considers as having to be omitted from the schedules. (**Price Schedule A**) The letters “**N/A**” should be entered in the appropriate columns if the Bidder considers the offered equipment to be complete.
- b. Should any item requested in the price schedule already form part of the main item, the Bidder shall mark these columns by filling in the word “**INCLUDED**”.
- c. The word “**NO OFFER**” should be entered in the appropriate columns if the Bidder cannot offer that specific item.
- d. All equipment spares, services, etc. will be listed in **Price Schedule B** for each main item.
- e. Any additional accessories, i.e. Power Supplies, Enclosures, etc., will be listed in **Price Schedule C** for each item.
- f. Should the Price Schedules in this Section not be adequate, additional Price Schedules should be compiled by the Bidder and included in his/her Covering Letter. Please refer clearly on the Price Schedule/s in this Section that additional Price Schedules are attached in your Covering Letter.

Failure to comply with the above-mentioned will invalidate the tender offer.

1.2. VALUE ADDED TAX AND ROUNDING OFF:

All rates shown will **include value added tax** and each item's price should be rounded off to the nearest **R 1.00**.

1.3. PRICE ESCALATION:

No price escalation for any item will be allowed.

1.4. QUANTITIES:

- a. No guarantee can be given to the Bidder with regard to the quantity of each item required.
- b. All quantities will be indicated on official orders from the various Regional Offices.

1.5. DELIVERY:

All delivery costs will be paid by the relevant Regional Offices, except in the case where the delivery address is located within a radius of 150 km from the Contactor's office/stores.

BIDDER'S SIGNATURE:

NAME OF BIDDER / COMPANY:

DATE:

**2. PRICE SCHEDULES FOR VANDAL RESISTANT EQUIPMENT HOUSING;
OFFER TO BE VALID FOR 120 DAYS FROM THE CLOSING DATE OF BID.**

| SCHEDULE A – BASIC UNIT | | |
|--------------------------------|--|----------------------------|
| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
| 2.1. | Custom size vandal resistant equipment hut door and frame with anti-tamper / anti-vandalism locking device, complete as specified: | |
| 2.2. | Anti-Tamper / Anti-Vandalism equipment enclosures / cabinets in various sizes and with various mounting options, complete as specified; Enclosure 1: | |
| 2.3. | Any other accessories required for complete installation: | |
| | (a) | |
| | (b) | |
| | (c) | |
| | (d) | |
| | (e) | |
| 2.4. | Anti-Tamper / Anti-Vandalism equipment enclosures / cabinets in various sizes and with various mounting options, complete as specified; Enclosure 2: | |
| 2.5. | Any other accessories required for complete installation: | |
| | (a) | |
| | (b) | |
| | (c) | |
| | (d) | |
| | (e) | |
| 2.6. | Anti-Tamper / Anti-Vandalism equipment enclosures / cabinets in various sizes and with various mounting options, complete as specified; Enclosure 3: | |
| 2.7. | Any other accessories required for complete installation: | |
| | (a) | |
| | (b) | |
| | (c) | |

| | | |
|---------------------------------|---|--|
| | (d) | |
| | (e) | |
| 2.8. | Man-Hole cover door with Anti-Tamper / Anti-Vandalism locking device | |
| 2.9. | Gauge Box - Protection device for sensors with anti-tamper locking device: | |
| | Any other accessories required for complete installation: | |
| | (a) | |
| | (b) | |
| 2.10. | (c) | |
| | (d) | |
| | (e) | |
| 2.11. | Draw Box - Adjustable piping connector with multiple adjustable inlets and anti-tamper locking device. | |
| | Any other accessories required for complete installation: | |
| | (a) | |
| | (b) | |
| 2.12. | (c) | |
| | (d) | |
| | (e) | |
| SCHEDULE B – MAINTENANCE | | |
| 2.13. | <p>Cost of labour for repair / replacement of: (per hour)</p> <ul style="list-style-type: none"> Items not covered by the guarantee (Listed in Technical Schedules), or Items which have become damaged / defective due to causes for which the manufacturer cannot be held responsible | |
| 2.14. | Cost of labour for General Maintenance and/or Back-up on Hardware and/or Software: (per hour) | |
| 2.15. | <p>Training at the two venues: (Include traveling, accommodation and meals)</p> <ul style="list-style-type: none"> North-West Province Eastern- or Southern Cape | |

| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
|-------------------------------------|--|---------------------|
| 2.16. | Cost for assistance on installations for the first 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
| | | |
| | | |
| 2.17. | Cost for maintenance / assistance on equipment for the second 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
| | | |
| | | |
| 2.18. | Cost for maintenance / assistance on equipment for the third 12 months at any gauging station in the RSA. (per kilometer, hourly rate & daily rate – including accommodation and meals) | |
| | | |
| | | |
| SCHEDULE B – SPARES | | |
| 2.19. | | |
| 2.20. | | |
| 2.21. | | |
| 2.22. | | |
| 2.23. | | |
| 2.24. | | |
| 2.25. | | |
| SCHEDULE C – ADDITIONAL ACCESSORIES | | |
| 2.26. | | |
| 2.27. | | |
| 2.28. | | |
| 2.29. | | |
| 2.30. | | |
| 2.31. | | |

| | | |
|---|--------------------|----------------------------|
| 2.32. | | |
| 2.33. | | |
| ITEM NO. | DESCRIPTION | RATE (VAT Included) |
| 2.34. | | |
| 2.35. | | |
| 2.36. | | |
| 2.37. | | |
| 2.38. | | |
| 2.39. | | |
| List all items of which the Prices are NOT FIRM, i.e. Effected by Rate of Exchange | | |
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| | | |
| | | |
| Applicable Rate of Exchange (On date of Signature) | | |
| = R | | |
| TOTAL BID PRICE (INCLUSIVE OF VAT) = R..... | | |

BIDDER'S SIGNATURE:
 NAME OF BIDDER / COMPANY:
 DATE: