BOREHOLE SUSTAINABLE YIELD TEST FOR WATER SUPPLY TRAINING: FROM THEORY TO PRACTICAL
24 - 27 FEBRUARY 2020, JOHANNESBURG, SOUTH AFRICA

CLOSING DATE FOR REGISTRATION HAS BEEN EXTENDED TO 24 JANUARY 2020
Anyone who owns a borehole is interested in knowing the maximum discharge rate at which they can abstract/pump groundwater in such a way that they can be assured of continuously getting that yield from their borehole. This borehole yield is sometimes referred as the safe yield or reliable yield. In South Africa, the term sustainable yield is typically used.

The estimation of borehole sustainable yield is based on the principles of aquifer pumping tests. To estimate borehole sustainable yield, an appropriate aquifer pumping test should be conducted and the data should be analysed using appropriate methods taking into considerations the capacity of the aquifer system and groundwater needs among other factors.

The components of this training are therefore designed to cover the theoretical aspects of borehole sustainable yield testing and analysis of data to estimate the yield. From theory, practical aquifer pumping test will be conducted by the participants with the guidance of the facilitator. The facilitator will then take the participants through processing and analysis of the data to understand flow characteristics and estimate the borehole sustainable yield. This training will provide an excellent opportunity for hands-on real life technical training on how to properly conduct a borehole sustainable yield test, data collection, processing and analysis to estimate the yield. The benefits for the participants are therefore immense.

**WHO CAN BENEFIT FROM ATTENDING?**


**BENEFITS OF ATTENDING ARE GAINING THEORETICAL AND PRACTICAL UNDERSTANDING OF THE FOLLOWING:**

- The importance of borehole sustainable yield,
- Designing and planning for borehole sustainable yield tests,
- Estimation of well efficiencies and implications for borehole development and long term operation cost,
- Field procedures for step-drawdown test and constant discharge rate aquifer pumping test, and
- Selection and application of appropriate methods to analyse aquifer pumping test data and estimate borehole sustainable yield.

**COURSE FACILITATOR: DR MODRECK GOMO**

Dr Modreck Gomo is a senior Geohydrology Researcher in groundwater with vast experience in a wide range of groundwater science research and consultancy projects. His first degree is a BSc Honours in Agricultural Engineering (2005) from the University of Zimbabwe, followed by a BSc Honours in Geohydrology (2008), an MSc in Geohydrology (2009), and a PhD in Geohydrology (2011) from the University of the Free State in South Africa. He has published over 20 research papers in peer-reviewed international journals. Dr Gomo is a registered professional natural scientist in the field of water resources with the South African Council for Natural Scientific Professions (SACNASP) and also a member of the Groundwater Division (GWD), South Africa.
Session One: Understanding basic concepts of groundwater science

- What is groundwater?
- Aquifer types
- Porous and fractured media
- Main aquifer parameters influencing the flow and storage of groundwater (Darcy’s Law, Hydraulic conductivity, Storativity, Transmissivity, Specific Storage and Specific yield)
- Other important terms

Session Two: Aquifer pumping tests

- Principles of aquifer pumping test
- Elaborating on the role of aquifer pumping tests in relation to regulatory requirements
- Understanding the main types of aquifer-pumping tests
- Understanding the measurements to be made and using appropriate pumping test equipment

Session Three: Aquifer pumping test of production boreholes for water supply purposes

- Well performance tests
  - Estimation of well efficiency
  - Demonstrating the value of well performance tests
- Estimation of reliable/safe/sustainable yield borehole yields
  - Understanding the test parameters and their values
  - Designing and planning for the tests
  - Field test procedures
  - Collection, storage and transportation of samples for quality testing
- Data analysis and interpretation methods and tools (inclusive of the FC method)
Day 2

Session One: Field Practical
Fluid electrical conductivity (FEC) profiling and step drawdown test

- Fluid electrical conductivity (FEC) profiling to identify main water strikes/groundwater flow zones
- Step drawdown test for calibration purposes and well efficiency evaluation
- Recovery while in the class

Session Two: Class
Processing and analysis of data from session one

- Use FEC profiles and drilling logs to identify the water strikes to determine pump placement depth for the constant discharge rate test
- Evaluate the step draw-down test data to determine the pumping rate for the constant discharge test

Session Three: Field Practical

- Constant discharge test (4 to 8 hours depending on time)
- Measurement of the recovery (at least 95%)

Day 3

Session One: Processing and analysis of the data

- Entering data into excel,
- Estimation of well efficiency,
- Estimation of borehole sustainable yield, and
- Principles of data analysis and interpretation.

Session Two:

- Hands-on individual exercises using historical data sets
- Interactive tutorial to discuss the exercise

Accreditation:
The training is accredited with 3 CPD points by the South African Council for Natural Scientific Professions (SACNASP).

Training Costs:
The 3 day training costs **R10 000 per person** inclusive of all training material, training venue and refreshments during the training.

Venue:
Venue will be communicated to interested candidates, but it will be in Johannesburg, South Africa.

Contact details:
Should you be interested in participating in this important training, kindly complete the online application form and return it to training@sado-gmi.org or contact our offices on 051 401 7722, before 24 January 2020.