MERCURY

Geophysical Logging Interpretations for Water Wells

28 June – 2 July 2027
Rome (Italy)



Dubai - UAE: +971 4 450 5697
Istanbul - Türkiye: +90 539 599 1206
Amman - Jordan: +962 79 712 3347

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Ref: 15921_338602 **Date:** 28 June – 2 July 2027 **Location:** Rome (Italy) **Fees:** 7200 Euro

Introduction:

Geophysical logging is essential for understanding subsurface conditions and optimizing water well design and management. Integrating advanced logging techniques provides detailed insights into geological formations, aquifer characteristics, and water quality parameters. Interpreting geophysical logs enables precise identification of stratigraphic layers, detection of water-bearing zones, and evaluation of well performance.

This Geophysical Logging Interpretations for Water Wells course equips participants with the knowledge and skills to interpret geophysical data effectively, ensuring sustainable groundwater exploration and development. Through practical case studies and hands-on exercises, participants will gain an understanding of the methodologies and applications of geophysical logging for water wells.

The Geophysical Logging Interpretations for Water Wells course provides the methods and tools for analyzing water wells. Participants will gain hands-on experience with geophysical logging equipment and learn to assess well water effectively using various tools.

This Geophysical Logging Interpretations for Water Wells training emphasizes the role of a geophysical logging engineer in interpreting well water test results and understanding the data provided by geophysical logging water wells. By mastering these techniques, participants will be equipped to use well water interpretation tools for accurate geophysical water well analysis, enhancing their expertise in water well assessments.

Targeted Groups:

- Hydrogeologists.
- Water Resource Engineers.
- Groundwater Consultants.
- Water Well Drilling Contractors.
- Environmental Scientists.
- Geophysicists specializing in groundwater studies.
- Government and regulatory agency professionals in water resource management.
- Researchers and academics in hydrogeology and geophysics.

Course Objectives:

At the end of this Geophysical Logging Interpretations for Water Wells course, the participants will:

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- Understand the principles and techniques of geophysical logging.
- Identify and interpret key subsurface geological features.
- Detect and evaluate aquifer zones and water-bearing formations.
- Analyze logging data to assess well performance and water quality.
- Integrate geophysical data into hydrogeological studies.
- Apply interpretation techniques for sustainable groundwater development.
- Develop practical skills in troubleshooting logging operations.
- Enhance decision-making in water well design and management.

Targeted Competencies:

By the end of this Geophysical Logging Interpretations for Water Wells training, the participant's competencies will:

- Proficiency in geophysical logging techniques.
- Interpretation of subsurface geological formations.
- Identification of aquifer zones and water-bearing layers.
- Analysis of well performance and water quality data.
- Integration of geophysical data with hydrogeological models.
- Decision-making in groundwater exploration and management.
- Application of logging data for sustainable water resource development.
- Troubleshooting and problem-solving in well-logging operations.

Course Content:

Unit 1: Introduction to Geophysical Logging:

- Overview of geophysical logging principles and techniques.
- Types of geophysical logs used in water well studies.
- Basic tools and equipment for geophysical logging.
- The role of geophysical logging in groundwater exploration.
- Understanding the significance of electrical, acoustic, and radioactive logs.
- The differences between borehole logging and surface geophysical methods.
- Applications of geophysical logging in environmental studies.

Unit 2: Geophysical Logs and Their Interpretation:

- Introduction to common geophysical logs resistivity, gamma-ray, sonic, etc..
- Interpretation of resistivity logs to identify water-bearing zones.
- Analysis of gamma-ray logs for stratigraphy and lithology identification.
- Understanding the sonic log and its role in formation evaluation.
- The significance of temperature and fluid logs in water quality assessment.
- Using spontaneous potential SP logs to detect water saturation.
- Integration of multiple logs to improve interpretation accuracy.

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Unit 3: Identifying and Evaluating Aquifer Zones:

- Techniques for identifying water-bearing formations.
- Determining aquifer porosity and permeability through geophysical data.
- Use of resistivity and sonic logs for aquifer evaluation.
- Interpret log data to detect aquifer thickness and extent.
- Identifying confined versus unconfined aquifers.
- Assessing the productivity of water wells using geophysical logs.
- Techniques for identifying zones of high transmissivity and storage.

Unit 4: Water Quality and Well Performance Analysis:

- Utilizing geophysical logs to assess water quality parameters.
- Identifying the presence of contaminants using geophysical data.
- Understanding the relationship between geophysical logs and water salinity.
- Analyzing temperature and resistivity logs to detect contamination.
- Evaluating well performance based on geophysical logging data.
- The role of geophysical logging in optimizing well design.
- Techniques for troubleshooting performance using log data.

Unit 5: Practical Applications and Case Studies:

- Real-world case studies of geophysical logging applications in water wells.
- Step-by-step interpretation of geophysical logs from actual projects.
- Best practices for integrating geophysical data into groundwater models.
- Troubleshooting common issues in water well logging operations.
- Strategies for data interpretation in complex geological settings.
- Geophysical logging is applied in well rehabilitation and maintenance.
- Hands-on exercises in log interpretation and report preparation.