

## Groundwater supply network management using SCADA System: A Case Study

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Supervisory Control and Data Acquisition (SCADA) systems have a significant role and application recently as they are making control and automation of systems much easier and more reliable. They are used for real-time acquisition of sensor data, monitoring equipment and controlling processes in water distribution systems, oil and gas pipelines, etc. Department of groundwater resources (DGR) has implemented SCADA systems through groundwater development project in Sri-somdej district, Roi-Ed province. The water supply system in the villages relies on the intakes of water from the six groundwater wells. Groundwater will be pumped into ground storage tanks and elevated storage tanks; then the water will be delivered to villagers by gravity through PVC and HDPE pipe line with more than 10 kilometers long. The DGR-SCADA system consists of monitoring, alarming and reporting functions such as monitoring the water levels in groundwater wells, flows and pressures on the outlets of submersible pumps, vertical multi-stage pump stations and water distribution pipeline, control of the TDS (Total Dissolved Solids) levels in water well. Instruments, such as electromagnetic flow meters, level meters, actuators, pressure meter, switches are located at the measuring points on pipelines, pumps and tanks. The signals from the instruments are sent via transmitters to the control panels. The users/operators can monitor the process at the control panel display as well as they can setup or adjust the process parameters according to the process conditions accordingly. While groundwater level measurement in the DGR SCADA system is used for monitoring the water level of the remote wells to ensure that the water level down is not exceed safe pumping limit and to secure that the groundwater resource can recover from the extraction, TDS levels in the wells are also monitored not to exceed allowable values. Flow and pressure measurements are used for monitoring pipeline networks in which control devices (automatic control valves, actuators, electrical motors in pumps) will be activated whenever there's fault alarms occurred by The SCADA center. Finally, the implementation of this project will help the operation of the water supply and distribution system significantly by maintaining regular and continuous supply of quality drinking water to improving the standard of living of the local population.

## LIST OF RECOMMENDED KEYWORDS

Agriculture  
Analytical solutions  
Aquitard  
Arid regions  
Arsenic  
Artificial recharge  
Biological conditions Bioremediation  
Carbonate rocks  
Chlorinated hydrocarbons Climate change  
Coastal aquifers  
Comment  
Compaction  
Conceptual models  
Confining units  
Contamination  
Crystalline rocks  
Developing countries  
Diffusion  
Drilling  
Earthquake  
Ecology  
Editorial  
Equipment/field techniques Fractured rocks  
Foundations (pedagogy)  
General hydrogeology  
Gender issue  
Geographic information systems  
Geologic fabric  
Geomorphology  
Geophysical methods  
Geotechnical problems  
Geostatistics  
Groundwater age  
Groundwater density/viscosity  
Groundwater development  
Groundwater exploration  
Groundwater flow  
Groundwater hydraulics  
Groundwater management  
Groundwater monitoring  
Groundwater protection  
Groundwater recharge/water budget Groundwater  
statistics Groundwater/surface-water relations Health  
Heterogeneity  
History of hydrogeology  
Hydraulic fracturing  
Hydraulic properties  
Hydraulic testing  
Hydrochemical modeling  
Hydrochemistry  
Hydrogeology Journal  
Igneous rocks  
Injection wells  
Inverse modeling  
Island hydrology  
Karst  
Laboratory experiments/measurements Landfills  
Legislation  
Lineaments  
Matrix diffusion  
Metamorphic rocks  
Microbial processes  
Mining  
Multiphase flow  
Nitrate  
Numerical modeling  
Organizations  
Over-abstraction Paleohydrology  
Profile (eminent hydrogeologist)  
Radioactive isotopes  
Radon  
Rainfall/runoff  
Regional review  
Remote sensing  
Reply  
Review (book)  
Salinization  
Salt-water/fresh-water relations  
Satellite imagery  
Scale effects  
Sedimentary rocks  
Socio-economic aspects  
Soil processes  
Solute transport  
Stable isotopes  
State of Science  
Statistical modeling  
Subsidence  
Tectonics  
Thermal conditions  
Tracer tests  
Transboundary aquifer  
Unconsolidated sediments  
Unsaturated zone  
Urban groundwater  
Volcanic aquifer  
Vulnerability mapping  
Waste disposal  
Water-resources conservation  
Water supply  
Well enhancement  
Wetlands