

Geospatial Techniques in Water Distribution Network Mapping and Modelling in Warri Port Complex (Nigeria)

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SUMMARY

A well planned and adequately mapped water distribution network plays an immense role in the provision of potable water supply. A good water distribution system is fundamental to environmentally sustainable development in any country and is also important in the control of water borne diseases. In this study, the use of Global Positioning System (GPS), Total Station Instrument in combination with Remote Sensing imagery in developing Warri port complex water supply network is discussed. In order to carry out the acquisition of geospatial data for the water infrastructure development, control points were established within the port complex by the method of Differential GPS survey. These control points were used in running secondary total station traverses through the proposed water distribution pipeline routes. The total station survey was carried out at millimetre (mm) level accuracy to capture break in slopes while support levels were run between the total station traverse routes. The processed geospatial data were input into Microsoft Excel software, and script files were created. The script files were exported into 3D Civil CAD from where vector models were generated. The distribution layout vector plan was exported into the topographical model generated from the satellite imagery. The geospatial database was exported into Haestad Water CAD environment for the water distribution network analysis and design. The output of the study was the water distribution network with the position of air valves, sluice valves, wash out, end caps, fire hydrants etc. located. The interpretation of the geospatial database with analytical tools allowed the water distribution network to be planned more economically and effectively.

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