Network Analysis for Collection and Distribution Systems

Bohannan Huston

- Modeling
- Master Planning
- Operational Investigations
- Water Loss Prevention
- Emergency Response Planning
- Water Quality
- Asset Management
- I/I Evaluations

Managing a Precious Resource…

Water systems represent a significant investment by the communities they serve. Hydraulic modeling of water and wastewater systems can help you maximize your investment in a number of ways:

- Create accurate simulations of system performance for maximum benefits.
- Provide a firm basis for master planning and capital improvements planning.
- Compare alternatives for capital projects.
- Understand the effects that improvements will have on the service you deliver.
- Optimize your operations to get the results you need – better water quality, electrical savings, water conservation.

Our engineers have extensive experience with large and small communities, with various industry software packages, complex model controls to simulate actual system operations, and with tools to more efficiently incorporate multiple data sources for model loading and demand forecasting.

Sustainability is an underlying foundation for our engineering solutions. We use the latest technology to model water and wastewater systems to identify potential supply and operational issues and to predict system responses to proposed changes.

Improving the Performance of Your City's Water Distribution and Wastewater Collection Infrastructure

Water is a common denominator for all of us, and BHI is applying advanced technologies and integrated approaches to help communities comply with ever-changing regulations, extend limited resources, rehabilitate aging infrastructure, and help meet the need for exceptional water quality in ample quantity well into the future.

Because modeling in the real world is about simulating and solving real application problems, our modeling experts can assist you in meeting current needs while planning ahead for growth, future supply and changing regulations.

Water distribution systems are affected by the rapid growth and development of communities, increased consumer interest in water quality, aging water infrastructure, regulatory, and security concerns. We understand that your distribution systems must deliver safe, clean water that meets service pressure and fire flow requirements, while achieving community supply demands.

An Integrated Solution Approach

Our experience and use of advanced technology allows us to streamline the work flow for creating and updating models, incorporating GIS data such as land use and water meter locations, and more efficiently load models based on billing data and/or land use. BHI has specialized experience in the following:

- Modeling in a GIS environment.
- Automated comparison of model networks to identify changes in geometry and attributes between model files.
- Model updates from GIS or CAD files. Extended period simulations for water quality and energy analysis.
- Sophisticated methods for updating model controls from Supervisory Control and Data Acquisition (SCADA) data.
- Automated processes for calculating model demands based on billing data and land use and then for loading the models.

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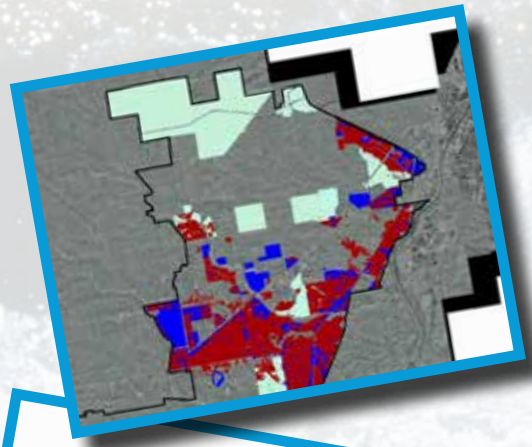
Relevant Experience

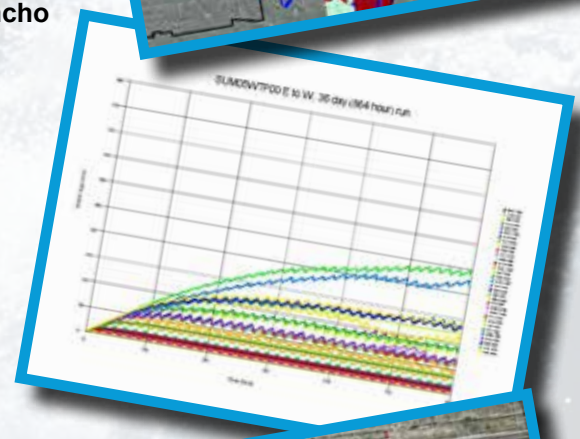
Reservoir Connection (Operations Plan) | ABCWUA

BHI completed an Operations Plan for integration of the City of Albuquerque's San Juan Chama (SJC) Drinking Water Project surface water supply into the existing groundwater supply system. This changed the operating philosophy significantly, and was made more complicated by water quality concerns. BHI added the new surface water system (pumps and transmission piping) to the model in Infowater and produced a recommended operating scenario to maintain arsenic levels below regulatory levels.



Water Systems Planning and Operational Evaluations | City of Rio Rancho

BHI provides ongoing support to the City of Rio Rancho for water model maintenance and water system planning. Our work includes updating the water model from GIS data, loading the model from billing data, model calibration to SCADA data, and system analysis for fire flows, operating pressures, and most recently, investigation of potential savings on electrical costs by operating pumps during off peak hours.



Water Modeling | City of Scottsdale

BHI supports the City of Scottsdale in updating the existing model network piping, demands and logic control. The system is complex, including numerous VFD closed loop booster stations, and model efficiency is critical in reducing run times. BHI also created a model for the City's reclaimed irrigation distribution system. Currently BHI is a teaming partner on the Scottsdale Water Master Plan Update.

Water and Wastewater System Master Plans | IHS — Jicarilla Apache Nation

BHI prepared Water and Wastewater System Master Plans for the community of Dulce, New Mexico, located on the Jicarilla Apache Indian Reservation. The models were based on GIS databases and topographic information gathered and processed by BHI's Spatial Data department. Master plan system analysis and recommendations were based on models in WaterGEMS and H2O Map Sewer GIS. BHI continues to serve the Nation as their on-call engineer, providing services that include regular utility map book updates and web map hosting.

Clovis Effluent Reuse | City of Clovis

BHI modeled the proposed reuse system to establish the basis of the design (also by BHI). This included validating customer base and reuse water demands, as these dictate the final design criteria for system operations. The project, now under construction, includes filtration and disinfection to provide Class 1A quality wastewater effluent, a low lift pump station to convey treated water to a high lift station, retrofitting an existing high lift pump station, over 8 miles of 18-inch transmission, and a 1.0 million gallon elevated composite reservoir storage tank.

Master Plan and Operations-Based Experience

Master Plans: City of Albuquerque Existing Water System Evaluation | City of Albuquerque Genetic Algorithm Model Preparation | City of Albuquerque Integrated Infrastructure Plan | City of Albuquerque Long-Range Service Plan | Entranosa Water and Wastewater Association Water System Master Plan | Los Alamos National Laboratory Water System Model Creation | New Mexico Utilities' Water Master Plan Update | City of Rio Rancho Comprehensive Master Plan | Sandia Heights Ultimate Development Water Systems Master Plan Report | Santolina Master Plan | City of Scottsdale Water Master Plan | City of Scottsdale Water and Wastewater Model Update

Operations: Systems Optimization Plans | Operation Plans | Water Age Analyses | Finished Water Transmission System Evaluations | Arsenic Evaluations | Analyses of Backup Water Supplies

Key Staff:

Staffing and expertise to augment your workforce.

Todd Burt, PE

Todd Burt, PE is a Vice President with BHI and has extensive experience in civil engineering with specific emphasis on water systems, pipeline design, and public works projects.

Jerry Edwards, PE

Jerry Edwards, PE hydraulic modeling experience includes developing, verifying and calibrating models; master planning, operational evaluations, water quality, and energy optimization studies.

Erin Clements, PE

Erin Clements, PE is experienced in all aspects of water distribution systems, from the evaluation and planning stages through construction completion. She is also experienced with master planning, identification of system deficiencies, design and construction administration and observation.

Nathan Roberts, PE

Nathan Roberts, PE experience in hydraulic modeling includes creating, calibrating, and maintaining models; as well as analyzing systems for deficiencies and Capital Improvement Projects (CIP). He has been lead modeler for advanced modeling projects involving water quality and electrical optimization evaluations.

In New Mexico:

Todd Burt, PE
Vice President
tburt@bhinc.com

7500 Jefferson Street, NE
Courtyard I
Albuquerque, NM 87109
505.823.1000
505.798.7988 fax

In Colorado:

Jerry Edwards, PE
Senior Project Manager
jedwards@bhinc.com

Meridian One
9785 Maroon Circle, Suite 140
Englewood, CO 80112
303.799.5103
303.799.5104 fax

Bohannan Huston

www.bhinc.com

Albuquerque • Denver • Las Cruces