Freese and Nichols, Inc. (FNI) is excited to expand our professional consulting services to support communities in the great state of North Carolina. After years of research and analysis, we opened our office at the NCSU Centennial Campus in Raleigh as part of a strategic growth initiative to better serve our clients and attract and retain the best talent in the nation. North Carolina’s Research Triangle area was selected because of its synergies with our areas of strength, as well as the fact that its business and local culture complement our own. We are committed to the greater Raleigh-Durham area and will pursue deliberate growth with a focus on client service and community investment.

For more than 120 years, FNI has built its practice on a strong foundation of client service and a commitment to project excellence. Our outstanding reputation for quality work results in nearly 90 percent of our work coming from repeat clients throughout the southern parts of the United States. Our primary focus remains being a trusted advisor for our clients.

As the Division Manager chosen to lead the operations in North Carolina, I am eager to carry on the fine tradition of providing the quality service and trusted advice for which FNI is known. Your home is now my home, and I look forward to becoming an integral part of your community.

Here, you will find information about our services, qualifications and the many strengths we bring to each endeavor. I look forward to working with you in the days ahead. In the meantime, please feel free to contact me with any comments or questions at 919-582-5860.

Sincerely,

Mike Wayts, P.E., CFM
Vice President/Principal

Since our founding, FNI has specialized in municipality work. We have developed successful public-private partnerships with more than 200 municipalities, which trust us as stewards of their capital building expenditures and operating budgets. By limiting our private work, we are also able to avoid potential conflicts of interest with our municipal clients.
Innovation

Just as John Hawley’s innovative engineering concepts in the late 1800s helped to make drinking water an accessible and safe resource, FNI employees continue to search for and provide clients with innovative solutions. It is a commitment that goes beyond solving a problem and, instead, consistently seeks to find better ways to accomplish tasks, no matter the magnitude of the challenge. Innovation is accomplished not just in how things are planned, but it’s also how things are done. From process to product, FNI strives to develop innovative ways of doing things.

The City of Keller’s 2.5-MG elevated storage tank is the industry’s first-ever joint-use elevated storage tank, an FNI-facilitated collaboration between the City of Keller and the Town of Westlake. The composite tank has two concentric-but-isolated tanks to provide independent storage for Keller (1.5 MG) and Westlake (1.0 MG).

The design accommodated neighborhood concerns with appealing landscaping, retaining wall, drainage improvements, automatic sprinkler system, high-security gates and access doors.

The project earned the Engineering Excellence Award from the Texas Council of Engineering Companies and was a finalist for the national Engineering Excellence Award from the American Council of Engineering Companies in 2003.
FNI provides the following key services within our practice of Water/Wastewater:

Water/Wastewater Utilities
- Wastewater collection and conveyance
- Water storage tanks
- Pump stations
- Water/wastewater design

Water/Wastewater Master Planning
- Strategic planning
- Water/wastewater system modeling
- Capital Improvement Plan (CIP) prioritization
- Regulatory compliance review
- Operational assistance
- Pressure plane delineation
- Energy analysis optimization

Water Quality
- Groundwater rule planning
- Water quality modeling
- Unidirectional flushing programs
- Nitrification investigation
- Water quality assessments
- Water age management
- Regulatory assistance
- Alternative disinfection strategies

Water Reclamation, Purification and Reuse
- Advanced water/wastewater treatment
- Treatment plant expansions and rehabilitation
- Membrane filtration and desalination
- Direct and indirect potable reuse applications
- Regulatory compliance
- Plant hydraulics and computational fluid dynamics
- Process and hydraulic modeling

Asset Management
- Geodatabase development
- Utility prioritization renewal program
- Renewal of water/wastewater facilities
- Risk-based management
- Infiltration/inflow studies
- Data integration services

Funding Assistance
- Impact fee programs
- Development agreements
- SRF project assistance
- Rate studies

How FNI Helps You
FNI has served as the trusted advisor for water-related issues since founder John Hawley became Texas’ first independent water and sewer engineer in 1894. In the last five years, FNI has designed more than $1.5 billion in water transmission projects, with enough capacity to serve more than 17 million people. We have a wide background with these projects, having completed pipeline projects from 6-inch up to 108-inch in diameter and pump stations up to 425 MGD.

Representing the Best Interests of our Client
FNI uses a client-focused approach to water/wastewater utility projects. We have been the firm of choice for many clients on fast track and complex design projects. We have standardized the use of 3D design and innovative approaches in completing these projects. In addition, FNI uses a value approach to design and construction phase services. The approach focuses upon initial capital cost, total life cycle cost, reliability, simple operations, local materials and construction practices, and fostering competition during the bidding phase. The approach allows each client to select the best overall approach to the system, rather than a standard cookbook approach that is not in the owner’s best interest.

Recognized Technical Excellence
FNI has adopted a culture of client service. We have put in place quality review processes, client surveys, executive client visits and training for our staff to be the very best at client service. This commitment has helped us be the only engineering/architecture firm to ever earn the national Malcolm Baldrige National Quality Award. As part of our Continuous Improvement (CI) process, FNI implemented our Technical Excellence Program (TEP). Staff members from across the company meet together on a regular basis to discuss changes in the industry, innovative techniques and lessons learned. The Water and Wastewater Utilities team has also implemented a new products committee, where promising new products are reviewed in great detail and potentially included as a standard product for our clients.

FNI offers integrated support services, which includes helping clients find project funding. To date, FNI has been instrumental in obtaining more than $450 million for clients’ water and wastewater projects.
FNI contracted with the City of Terrell to provide design and construction representation services for water system improvements throughout the City. Up until that time, the City had operated its own water treatment plant on the east side of the City and pumped water through the system from east to west. Based upon a financial analysis the City performed, they decided to discontinue use of its water treatment plant and to begin purchasing all of its water from the North Texas Municipal Water District (NTMWD).

With the new water delivery point on the west side of the City, a ground storage tank, pump station, and extensive water distribution improvements were necessary to allow water to be pumped west to east in the system. FNI designed the improvements in three construction projects, including two water distribution line projects and a pump station/ground storage tank project.

The $2.5-million project included approximately 50,000 linear feet of 20- and 12-inch PVC pipe to provide connections to the existing Terrell water system. FNI assisted the City with sizing and preparing metes and bounds and plating documents for the proposed pump station/ground storage tank site. The site layout allowed for the initial construction of a 5.0 MGD pump station building (with room for expansion up to 20.0 MGD) and a 3.0 MG ground storage tank. The site layout also allowed for a future pump station building to bring the total capacity up to 25.0 MGD, another 3.0 MG ground storage tank, and a 3.5 MG ground storage tank. FNI provided design and on-site construction representation services for the initial pump station and ground storage tank. Some of the major project activities included:

- Coordination with both the City of Terrell and NTMWD, which provided financing for the project
- Architectural design of the pump station building to match overlay district requirements
- Tie-in coordination with the NTMWD water supply line
- Chlorine and ammonia injection and monitoring facilities
- Coordination of pump station start-up with decommissioning of the water treatment plant
CASE STUDY
Central Wastewater Treatment Plant Influent Pump Station,
Dallas Water Utilities

FNI developed an investigation/study, conducted preliminary design, final design and is currently facilitating construction phase services for the new Influent Pump Station (IPS) to serve the CCWWTP and enhance peak wet weather flow management. The study phase included a detailed analysis of anticipated design flows, major equipment, site analysis, and hydraulic evaluation.

Stage 1 design and construction involves the demolition of four trickling filters and the initial construction of the IPS with a preliminary firm pumping capacity of approximately 335 MGD. The IPS will utilize Vertical Turbine Solids Handling (VTSH) pumps with 42-inch column diameters at a 62-foot overall length, and when completed will be the largest capacity-based and deepest set installation in the world.

At a firm capacity of 335 MGD, the IPS will replace the pumping capacity provided by the Cadiz Street Pump Station and supplement the pumping capacity from the White Rock and South Dallas Peak Flow Pump Stations as well as off-loading a portion of the influent flow from the White Rock Raw Sewage Pump Station.

Stage 1 construction also includes a Coarse Screening Facility with three coarse screens designed to handle all Stage 1 flows. These screens use a chain driven rake design with front-clean/front-return operation and are over 47-feet deep with 1-inch bar spacing. The project also includes an electrical building and associated electrical and instrumentation equipment, transformer yard with connection points for portable generators, a bio-filter complex for odor abatement, 72- and 90-inch yard piping, valves and metering, and the rehabilitation of 12 existing trickling filters. The future Stage 2 of the IPS will include the addition of a fourth coarse screen and two VTSH pumps to provide a maximum hydraulic capacity of 465 MGD.

Client Reference
Regina Stencel, P.E.
W/WW Facilities Project Manager
Dallas Water Utilities
2121 Main Street, Suite 300
Dallas, Texas 75201
214-671-9184
regina.stencel@dallascityhall.com
FNI designed the City of The Colony’s 5-MGD lift station and accompanying 16-inch force main to accommodate wastewater flows from the City’s Wynnwood Peninsula to the City’s Stewart Creek Wastewater Treatment Plant. Work for the force main included 19,400 linear feet of 16-inch force main with a 1,500 linear feet 20-inch High Density Polyethylene (HDPE) by directional drilling under Lake Lewisville. Work for the lift station included the underground concrete lift station structure, pumps, piping, appurtenances, electrical and control building, odor control and back-up generator.

A key element in this project was the preparation of easement instruments for later acquisition of right of ways. FNI worked closely with the Wynnwood developer and the City’s right-of-way acquisition consultant to ensure that easements routed west from FM 423 were wide enough to accommodate the force main and a water line according to TCEQ requirements for minimum separation distances.

FNI also provided geotechnical services to coordinate foundation piers because of the depth of the lift station. FNI’s responsibilities included selection of pipeline alignment and routing, hydraulic analysis, pipe sizing and configuration, pump selection, site layout and grading, odor control, tunnel bore TxDOT crossing, creek and utility crossings. Required coordination with U.S. Corps of Engineers, environmental, survey, utility companies and land owners.

Client Reference
Gordon Scruggs, P.E., CFM
Director of Engineering
City of The Colony
6800 Main Street
The Colony, Texas 75056
972-624-1137
gscruggs@thecolonytx.gov
In 2011, FNI re-designed and re-constructed the Rabbit Creek Trunk Sewer Main Line, which was originally constructed in the 1980s. The line was 18- and 21-inch Spirolite PVC located in the Rabbit Creek flood plain. Improper installation of the initial line in poor soils resulted in severe defects in the pipe. The project included over three miles of 18- and 21-inch PVC in poor soil conditions, with three major road crossings and several creek crossings.

FNI provided cost and schedule estimates, resulting in the City forgoing previously secured state loans and cash-financing the project. The project received fast-track design in order to take advantage of dry conditions, with FNI completing design in less than 10 weeks. Landowner issues were resolved concurrently and the project was completed four months ahead of schedule and almost $2 million under the City’s original cost estimates.

Because of the known poor soil conditions, a detailed geotechnical investigation was prepared that identified a high groundwater table and widely ranging soil conditions. This information was utilized in the pipe selection process and buoyancy design, as well as the trench design.

CASE STUDY Rabbit Creek Trunk Sewer Main Rehabilitation, City of Kilgore

Client Reference
Scott Sellers
City Manager
City of Kilgore
P.O. Box 990
Kilgore, Texas 75663
903-984-5081
scott.sellers@cityofkilgore.com
FNI conducted the route study and designed the 43,800-linear-foot, 60-inch Rowlett Cottonwood gravity wastewater interceptor for the North Texas Municipal Water District (NTMWD) to serve the Cities of Plano, Frisco, Allen, Fairview and Richardson. The $11-million interceptor parallels an existing 60-inch sewer line and includes a new junction box, wastewater treatment plant tie-in, and odor control — all without taking the existing line out of service. It also doubles the capacity for a fast-growth area. FNI studied several routes to recommend a route that did not require siphoning. The design required significant coordination with utilities and a detailed traffic control plan because of its placement through a heavily populated, well-traveled area. The project also required the coordination with a new roadway to facilitate construction, sequencing and traffic control.

FNI offered multiple materials options to reduce NTMWD’s construction costs. The project required two complex tie-ins to facilitate continuous operations. The design also included box culverts and 500 feet of concrete-encased, above grade pipe to meet the project’s unique hydraulic requirements.

This project was particularly sensitive because the new interceptor was located in the front yards of several homes in an Allen neighborhood. FNI worked closely with the homeowners’ association and the City of Allen and held several public meetings to educate the community on the project’s impact. Odor control measures were included to address homeowners’ concerns.
2.5-MG Joint-use Elevated Storage Tank
– City of Keller/Town of Westlake

The City of Keller’s 2.5-MG elevated storage tank is the industry’s first-ever joint-use elevated storage tank, an FNI-facilitated collaboration between the City of Keller and the Town of Westlake. The composite tank has two concentric-but-isolated tanks to provide independent storage for Keller (1.5 MG) and Westlake (1.0 MG).

The design accommodated neighborhood concerns with appealing landscaping, retaining wall, drainage improvements, automatic sprinkler system, high-security gates and access doors.

The project earned the Engineering Excellence Award from the Texas Council of Engineering Companies and was a finalist for the national Engineering Excellence Award from the American Council of Engineering Companies in 2003.

Elevated Storage Tank and First Street Water Line – Town of Prosper

FNI provided design and construction phase services for a 1.5-MG composite elevated storage tank and approximately 8,500 linear feet of 20-inch water line to connect the new elevated tank to the Town’s distribution system and upgrade undersized water lines. FNI used 3-D visualization to display architectural design options on the tank pedestal.

Eldorado Parkway 2.0-MG Elevated Storage Tank – Town of Little Elm

This project includes construction of a 2.0-MG composite elevated water storage tank, associated site improvements and appurtenances, yard piping modifications and drainage improvements to the Walker Lane tank site. Rehabilitation of the tank, as well as demolition and removal of two pressure-reducing vaults, was also completed. The project also included valves and piping, landscaping and irrigation improvements to the FM 423 tank site.
FNI designed the $130-million Ward County Transmission System in seven months and managed construction to completion in 11 months to help the Colorado River Municipal Water District (CRMWD) respond to 10 years of drought conditions that had lowered the storage volume of CRMWD’s three reservoirs to 5.5 percent. It was pumping two weeks ahead of schedule and was completed $10 million under budget.

The system included:

- 41.6 miles of 42- and 48-inch transmission pipeline
- 22 miles of 10- to 36-inch well collection lines
- 30-MGD well-field booster pump station with a 2-MG ground storage tank
- 30-MGD transmission pump station with a 2-MG ground storage tank
- 25-MGD Odessa Booster Pump Station to move water backwards through the system
- 6-MGD Big Spring Booster Pump Station to move water backwards through the system
- Multiple connections to existing water transmission facilities

To fast-track the project, the transmission pipeline was separated into two construction contracts. FNI’s design called for trench-excavated materials to speed up the project and save CRMWD an estimated $3 million. CRMWD used the Construction Manager-at-Risk (CMAR) project delivery system, charging the CMAR with purchasing all equipment. It used the Competitive Seal Proposal (CSP) process for CMAR selection and all equipment and construction contracts.

To further expedite the project, it included several equipment pre-purchase bid packages. The design also incorporated use of pre-packaged pump skids to shorten the construction phase schedule. The project required seven pipe production plants, seven pipe laying crews and four construction contractors to meet the challenging schedule.
FNI completed a comprehensive Water Distribution System Master Plan in 2007 for the City of Arlington, which serves about 375,000 people, and is currently conducting an update to the Water Master Plan. The master plan provided the City with a long-term CIP to expand its system to regional water system service.

Integrating H2OMAP Water Model with GIS System
Incorporating the City’s GIS data enhances the system model for updates and future calibrations, takes advantage of the system attribute data and provides a single, complete data source for its water system, maintaining a one-to-one relationship between GIS and the water model. FNI developed an all-pipes model for Arlington, one of the largest completed to date at 75,000 pipes, to allow the City to plan for long-term growth and reliability needs.

Field Testing and Model Calibration
Pressure testing was conducted at 22 locations throughout the City in four pressure planes for two weeks. The calibrations performed were completed using operational controls over a 24-hour period. These same controls were used to develop the future planning models.

FNI also conducted pump testing at each pumping facility to evaluate actual pumping capacities as compared to the original factory curve.

Demand Development
FNI broke down demand into four categories: single family residential, multi-family residential, nonresidential and wholesale. Existing land use by parcel was identified by matching it up to the City’s billing database and existing land use file. Future population and commercial/industrial projections were developed using the City’s 2025 Development Master Land Use Plan and densities by Census Tract from the 2000 Census. All of the population and demand data is stored in a database by parcel that will allow the City to quickly analyze changes in population or demand assumptions and can be joined with other GIS databases to show information graphically.

Future System Analysis
All of the future system modeling was performed with extended period simulations under winter, average day and maximum day demand conditions. In addition to evaluating improvements for growth, FNI evaluated back-up supply options to the Upper and Lower Pressure Planes should either pressure plane lose a water treatment plant.
CASE STUDY

Water and Wastewater Master Plan and Reuse Master Plan, City of Frisco

FNI integrated the City of Frisco’s Geographic Information System (GIS) into its water, wastewater and reuse hydraulic models to create a strategic tool for effectively addressing the City’s unparalleled growth. The current City population is about 121,500 and projected to nearly double in 25 years. The resulting CIP is about 121,500 and projected to nearly double in 25 years. The resulti ng CIP eliminates existing deficiencies, and is phased in multiple bond programs.

Wastewater Master Plan
FNI conducted a cost/benefit analysis of wastewater treatment plant expansion vs. flow diversion, including alternative “what-if” recommendations for sizing interceptors to divert flow to another treatment plant. This included developing a phased CIP for expanding lift station on capacity to help divert flow. FNI analyzed flow data to determine areas of excess lift/then updated and calibrated the hydraulic wastewater model. Flow monitoring and hydraulic modeling were used to identify an effective engineering solution for the Stewart Creek Wastewater Treatment Plant capacity issues. FNI conducted workshops with City staff and NTMWD, the City’s wholesale provider, to determine the most effective solutions from the alternative analysis.

FNI also conducted an impact fee analysis to determine how much of the wastewater system improvements were eligible for developer reimbursement.

Reuse Master Plan
FNI developed a Reuse Master Plan and a CIP that will give the City a total reuse capacity of 25 MGD at build-out. The phased plan maximizes the use of reuse water from the Stewart Creek Wastewater Treatment Plant and the Panther Creek Wastewater Treatment Plant, incorporating existing ground storage tanks and pumping facilities into the reuse infrastructure. FNI also developed a model of the City’s reuse system, identifying and evaluating potential customers, projecting future demands, evaluating potential cost savings in water-use augmentation and laying out a cost-effective, phased CIP.

FNI developed the plan to provide direction on where reuse lines were needed and the recommended phasing and sizing of new construction. As part of the master planning process, FNI assisted the City in determining what compliance documentation and additional coordination was needed between the City, NTMWD and TCEQ.
FNI developed a CIP for the City of Irving for the five-, 10- and 20-year planning periods. The project involved developing and calibrating a wastewater model in the H2OMAP SWMM software. Flow monitoring was conducted at 35 locations throughout the collection system, along with field surveying of selected manholes and special structures to verify invert data. Model calibration was performed for all 35 locations for dry-weather and two wet-weather storm events.

Model Development and Calibration

FNI conducted extensive updates to the City’s GIS with GPS surveying at every third manhole in the collection system. FNI also conducted a detailed review of thousands of as-built records to confirm connectivity and obtain attribute data prior to conducting GPS survey. The wastewater modeling software was used to prepare profiles of each interceptor to identify errors in connectivity and in invert elevation data. A number of lift stations were added as well as special junction structures with detailed surveying. Model verification was done with updated business processes to allow the model to become sustainable in the future as GIS updates and new lines are constructed.

Model calibration was performed for multiple storm events representing two wet-weather periods using the RTK method. The calibrated model was adjusted to a five-year, six-hour design storm events and used for the hydraulic capacity analysis.

Wastewater Capacity/Condition CIP Priority Analysis Process

The City and FNI developed a risk-based assessment program, which included a scoring system for the renewal/rehabilitation prioritization process. This will allow for continual updating, as the City makes improvements in the wastewater system. The wastewater system model was used to evaluate the existing system capacity, to plan for projected rapid growth in both residential and commercial development corridors and evaluate potential future wholesale customer service.

Comprehensive Plan Development and Deliverables

The final comprehensive CIP for the City incorporates projects needed for growth and rehabilitation/replacement projects for the main interceptors. The CIP was phased into three planning periods with capacity fee assessment determined for five-, 10- and 20-year growth needs for development cost participation.
The City of Sanford, North Carolina, owns and operates the Gaster’s Creek Lift Station. The current station consists of two 2,800-GPM constant-speed pumps, which discharge flow to a gravity system located near the intersection of St. Andrews Church Road (SR 1146) and Tramway Road (SH 78) through approximately 17,075 linear feet of 18-inch Ductile Iron Pipe (DIP) force main. The manhole and portions of the collection system at the point of the force main connection has experienced significant corrosion and has been the source of multiple odor complaints.

The lift station has undergone multiple modifications and upgrades since it was originally constructed. The station’s wet-well capacity, coupled with the existing pump size, leads to excessive cycling and short-duration run times for the pumps. The capacity of the wet well has been expanded over the past several years and with the expansion, the number of starts per hour of the existing pumps were reduced, although the pump run time for each cycle is still a short duration.

FNI evaluated various alternatives to address the odor and corrosion issues, including modifications at the lift station and changes to the force main and gravity main system. In addition, FNI also evaluated the station’s existing electrical system and overall operation.

To provide more consistent flow through the force main, better handle low flows and reduced wear on the existing pumps, FNI recommended the installation of a small jockey pump. The existing station has space limitations making the installation of a third pump difficult. This required a careful evaluation of various alternatives that would provide a system to meet the City’s needs, but also to comply with current North Carolina Department of Environment and Natural Resources (NCDENR) regulations, as well as National Electrical Code (NEC) regulations regarding the existing and proposed electrical equipment. After evaluating multiple alternatives, installation of a submersible pump directly into the wet well was recommended. FNI is currently completing the design of these improvements, which includes a new building to house the new and some proposed equipment.
The Colorado River Municipal Water District (CRMWD) recently began producing a new municipal water source using treated wastewater effluent. Their Raw Water Production Facility (RWPF) diverts up to 2.5 MGD of effluent from the Big Spring Water Reclamation Plant and treats it to near-bottled water quality. The RWPF provides membrane filtration, reverse osmosis and ultraviolet oxidation to achieve a water quality superior to other raw water supplies controlled by the CRMWD. The product water is blended into the District’s Spence Pipeline east of Big Spring. This is believed to be the first facility in North America to blend reclaimed water directly in a raw water distribution pipeline.

FNI completed the design and provided construction and startup services for this unique facility. CRMWD selected FNI for a feasibility study to assess water supply augmentation with reclaimed wastewater. Three regional projects were evaluated, located to serve CRMWD’s member cities of Big Spring, Snyder and Odessa, as well as the City of Midland, a key customer city. Following the positive feasibility determination, FNI was retained to provide permitting, pilot testing, design and construction phase assistance for the first facility, located in Big Spring.

The project was featured in the Texas WET Magazine’s November 2011 issue. FNI also presented this project at the WateReuse Symposium, the AWWA Annual Conference and Exposition, and several other venues.
FNI evaluated the City’s existing and aging package WWTP, evaluating its ability to meet more stringent discharge permits and provide the City with continued service and expendability. We recommended replacement of the facility as part of a long-term solution for wastewater compliance. As part of the project, FNI assisted the City in obtaining State Revolving Funds and developed a feasibility report, preliminary design report, odor abatement study, and final design and contract documents. FNI also provided advertisements, bids and construction representation, as well as management, surveying, geotechnical and environmental clearance services.

To meet regulatory requirements and the City’s need for a long-term solution, FNI master-planned the existing site to include a new 0.6 MGD treatment plant. This plant included an expandable fine screening structure, influent lift station, sequencing batch reactors for biological nutrient removal, effluent cloth media filters, ultraviolet disinfection and an odor control system. Other components of the project included reuse of existing sludge storage and processing facilities, a 60-foot-tall retaining wall system for slope stabilization and land reclamation purposes, separate potable and plant service water systems, a new maintenance and office building, a new 480-volt electric feed system, a backup electric generator with automatic switch-over, a supervisory control and data acquisition system with human-machine interface, and landscaping and noise abatement measures to minimize the WWTP’s presence in the high-end neighborhood.

The project has won several awards, including most recently the 2013 Municipal Excellence Award for Public Works given by the Texas Municipal League.

“From day one, FNI has understood the needs of Aledo. The WWTP was of concern and FNI fully researched and designed the best option not only for the present need, but also with additional future capital phases as the population increases. Great Job Team!”

— Gordon Smith
Director of Public Works
City of Aledo

Client Reference
Gordon Smith
Director of Public Works
City of Aledo
P.O. Box 1
Aledo, Texas 76008
817-441-7016
gordon.smith@aledo-texas.com
The City of Arlington operates two water treatment plants, the Pierce Burch Water Treatment Plant (PBWTP) and the John F. Kubala Water treatment Plant (JKWTP). Beginning with the original construction of the PBWTP in 1956, Freese and Nichols has been involved in multiple projects at the two plants.

**Pierce Burch WTP**

FNI designed the original PBWTP in 1956. Since the original work on the plant, FNI has been involved in nearly all major plant improvements designed for the facility with subsequent work occurring over the last 50 years.

FNI provided preliminary engineering, final design and construction/warranty phase services for the $19.24-million ozone addition and filter renovations at the 75-MGD PBWTP starting in 1996. After pre-ozonation, rapid mixing and settling, the water passes through an intermediate ozone contactor then onto filtration and final chloramination. FNI provided general and resident representation services for the PBWTP during the construction of the ozone facilities and the filter modifications.

Most recently, FNI has assisted the City with developing an Asset Management and Condition Assessment program at the plant and conducted hydraulic evaluations to remove hydraulic bottlenecks and recapture lost capacity.

**John Kubala WTP**

FNI was involved in providing predesign, design and construction phase services for two 32.5 MGD expansions to the JKWTP increasing the capacity to 97.5 MGD. FNI provided the design of the flocculation basin, sedimentation basin and chemical feed improvements consisting of new chemical feed pumps and piping, and a design of a new chlorine scrubber system during the $14.79-million expansion in 1999. FNI also provided design of the flocculation basin, sedimentation basin and chemical feed improvements and high service pumping during the $29-million expansion in 2006. The design of the flocculation and sedimentation basins during both expansions incorporated three stage adjustable tapered mechanical flocculation, and conventional sedimentation. Sludge removal was accomplished by means of a floating bridge traveling siphon system.

FNI provided general and resident representation services for the JKWTP during the construction of the ozone facilities and the conventional plant expansions. The first expansion was completed in 2002, almost four months ahead of schedule, and the next expansion was completed in 2010.
OUR TEAM

Mike Wayts, P.E., CFM

Mike Wayts, a Principal/Vice President at FNI, is the firm’s Southeast Division Manager, responsible for opening FNI’s Raleigh-Durham office on North Carolina State’s Centennial Campus. He has a variety of project experience with municipalities. Mr. Wayts understands the municipal client and the public they serve. He has in depth experience in managing projects, conceptual planning and design, and he excels at achieving public buy-in on highly controversial projects. His relevant project experience includes:

- **Gaster Creek Lift Station Preliminary Design, City of Sanford – Principal-in-Charge.** FNI evaluated corrosion and odor issues downstream of the Gaster Creek Pump Station. Alternatives evaluated to help with these issues included installation of a jockey pump at the pump station, downstream gravity conveyance improvements or force main conveyance improvements.

- **Wastewater Services – City of Morganton – Principal-in-Charge.** The City selected FNI to be their Wastewater Engineer for an on-call services contract. The first assignment will address the evaluation of biosolid slope erosion including methods to stabilize, groundwater sampling and testing, and coordination with DENR.

- **Elm Fork 72-inch Water Line – North End, Dallas Water Utilities (subconsultant) – Project Engineer.** As a subconsultant to another firm, FNI assisted with a preliminary design report for a 28,000 linear foot pipeline from the Elm Fork Water Treatment Plant to a point north of LBJ Freeway. The concrete cylinder pipeline goes through the Cities of Carrollton, Farmers Branch and Dallas. The pipeline parallels the Burlington Northern Railroad for 14,000 feet and the Union Pacific Railroad for 8,000 feet. Since the pipeline will be located within the railroad right-of-way, there was considerable negotiation with Burlington Northern.

- **Wilson Creek Main Interceptor, City of McKinney – Project Engineer.** Design of two miles of 48-inch relief interceptor crossing two federal highways and a railroad. Design included several junction boxes, erosion protection, pipe loading and corrosion protection.

- **Water Line Improvements for Oak, Lela, Byrne and Hill Streets, City of McKinney – Project Engineer.** Design of 6- and 8-inch waterline improvements for Oak, Lela, Byrne and Hill Streets including more than one mile of water line in older sections of the City.

Charles Archer

Charles Archer joined the firm in January 2013 as an Account Director for our office at NCSU Centennial Campus in Raleigh. Charles received both his B.S. in Political Science and his Master of Public Administration from East Carolina State University. Prior to joining FNI, Charles spent 12 years with the North Carolina League of Municipalities serving as their Director of Intergovernmental Relations and then Chief Operating Officer. Mr. Archer has also held positions as the County Manager for Halifax County in North Carolina and the Director of Planning for the City of Roanoke Rapids, North Carolina.

Mr. Archer’s in-depth knowledge of North Carolina communities is a crucial component to increasing public involvement and gaining public support for local projects. His community experience and decades of public engagement activity as the Halifax County Manager, as well as his lobbying efforts with the League of Municipalities, is a strength for our team that will prove invaluable to our clients. Prior to joining FNI, Mr. Archer was responsible for the following projects:

- **Halifax-Northampton Regional Airport – Guided master plan development, secured funding and acquired land for a new general aviation airport.**

- **Halifax Industrial Center – Managed the development of a new industrial park, which involved land acquisition, design, infrastructure improvements and funding. Millions of dollars in grant funds were secured, allowing for the purchase of land, construction of an elevated water tank, road improvements and wastewater pretreatment plant construction. The infrastructure served the operational needs of Reeser’s Fine Foods, which was recruited to the county once park development was complete.**

- **Halifax County Industrial Shell Building – Secured funding and managed the development of the shell building in Halifax Industrial Center, which is now occupied by PCB Piezotronics.**

- **Halifax County Water System Expansion – Managed the $15-million expansion of the county’s water system, including the passage of a general obligation bond referendum to fund improvements.**
**OUR TEAM**

**Water/Wastewater Professionals**

**Brian Coltharp, P.E.**

Brian Coltharp is an FNI Vice President/Principal and the Water/Wastewater Transmission and Utilities Group Manager. He is responsible for resource allocation, quality, financial performance and client development for the group. Mr. Coltharp is one of FNI's most experienced Project Managers with a proven reputation for maximizing clients' budgets and managing large-scale pump/lift station and pipeline design and construction projects on tight schedules. His experience includes:

- **Water/Wastewater Main Replacements, Dallas Water Utilities – Principal-in-Charge.** Over saw approximately 68 projects around central and north Dallas replacing roughly 120,000 linear feet of water and wastewater mains. For all contracts, any pipe less than 8 inches in diameter, older than 50 years, and all vitrified clay wastewater pipes or cast iron water pipes were marked for replacement.
- **Rolater Road 48-inch Water Line, City of Frisco – Principal-in-Charge.** Preliminary design, construction contract documents and limited construction phase services for the City's Rolater Road 48-inch water line. This facility included approximately 13,900 feet of 48-inch treated water pipeline and associated appurtenances.
- **Rowlett Sub-Basin Relief Line, Phase I, City of Garland – Principal-in-Charge.** Design of a new sanitary sewer trunk main along the northern banks of Spring Creek in north Garland to provide sufficient capacity for future build-out conditions of the area along the southern side of SH 190. This project included a preliminary design report with route options, public involvement meetings, preliminary and final design processes, and coordination with other entities for ROW and easement purchases.
- **Broadway Pump Station Rehabilitation, City of Garland – Principal-in-Charge.** Expansion of the Broadway Pump Station to allow for the full use of storage tanks and increase the available pumping capacity for the system. The new pump station was constructed on the existing pump station site and tested while leaving the existing system in operation.

**Bryan Jann, P.E.**

Bryan Jann is an FNI Associate and Senior Water/Wastewater Utilities Project Manager. He specializes in wastewater conveyance, where he has extensive experience with interceptor design and rehabilitation on lines from six inches up to 108 inches in diameter. His background also includes new construction and rehabilitation and expansion of water and wastewater pump stations, up to 425 MGD. His relevant project experience includes:

- **Central WWTP Influent Pump Station, Dallas Water Utilities – Project Manager.** Evaluation, preliminary design, design and construction services of a $50 million, 425-MGD raw wastewater pump station at DWU's 150-MGD Central Wastewater Treatment Plant. The IPS will be the largest installation in the United States of this type. Additional pump slots will be added for a total of eight pumps at build-out. Stage 3 construction also includes a Coarse Screening Facility with three 161-MGD coarse screens.
- **Gaster Creek Lift Station Preliminary Design, City of Sanford – Project Manager.** FNI evaluated corrosion and odor issues downstream of the Gaster Creek Pump Station. Alternatives evaluated to help with these issues included installation of a jockey pump at the pump station, downstream gravity conveyance improvements or force main conveyance improvements.
- **Wastewater Services – City of Morganton – Project Manager.** The City selected FNI to be their Wastewater Engineer for an on-call services contract. The first assignment will address the evaluation of biosolid slope erosion including methods to stabilize, groundwater sampling and testing, and coordination with DENR.
- **Lift Station 8 and Associated Piping, City of Weatherford, Texas – Project Manager.** Lift station project, which included the preliminary design, final design, bidding and general construction representation. The project included 13,400 linear feet of gravity main, ranging in size from 24 to 12 inches, 5,700 linear feet of 10-inch PVC force main, and decommissioning and relocation of the existing lift station for diversion of flows to the new lift station.
- **Ward County Water Transmission Project, Colorado River Municipal Water District, Big Spring, Texas – Assistant Project Manager.** Design of the Odessa Pump Station (25 MGD), Well Field Pump Station (30 MGD), and Big Spring Pump Station (6 MGD). The entire project included the design of four pump stations and 45 miles of 48-inch and 42-inch pipeline. It was performed on a fast-track emergency basis.
Jessica Brown, P.E.

Jessica Brown is an FNI Principal/Vice President and Manager in the firm’s Water/Wastewater Master Planning Group. She is one of FNI’s most experienced planning and modeling professionals and has served as Project Manager/Engineer for nearly 60 water and wastewater system studies, master plans and asset management programs for small and large cities. Her expertise includes the calibration and use of system models for master planning and CIP development and the integration of GIS into water and wastewater models. Ms. Brown’s practical master planning and system study approach is strengthened by her hands-on design experience in both collection and distribution systems. Ms. Brown has presented multiple papers related to modeling and asset management at both state and national level conferences. Her relevant project experience includes:

- **Water Master Plan, City of Fort Worth – Project Manager.** Water System Master Plan to take the City to its projected 2025 population of 1.4 million, including 29 wholesale customers. The comprehensive, 20-year CIP, which calls for $1.2 billion in improvements, will allow the City to extend water service to surrounding counties. The project included assistance with ISOE sampling plan and final DBP compliance sampling site selection.

- **Water System Studies, Master Plans and Updates, Miscellaneous Clients – Project Team Leader.** Includes Cities of Arlington, Burleson, College Station, Denton, Fort Worth, Frisco, Gainesville, Garland, Grand Prairie, Grapevine, Hurst, Keller, Kennedale, Killeen, Lubbock, Mansfield, North Richland Hills, San Angelo, Weatherford and Wichita Falls; Towns of Addison and Prosper; Benbrook Water Authority, Colorado River Municipal Water District; DFW International Airport; and McAllen Public Utility.

- **Wastewater System Studies, Master Plans and Updates, Miscellaneous Clients – Project Team Leader.** Includes Cities of Arlington; Burleson; Cedar Hill; Cleburne; Corinth; Fort Worth; Frisco; Gainesville; Irving; Keller; Killeen; Mansfield; Midlothian; North Richland Hills; Pottsboro; San Angelo; Taylor; Terrell; Vernon; Town of Prosper; Benbrook Water Authority; and Trinity River Authority Mountain View System.

Corrie Bondar, P.E.

Corrie Bondar is a Project Engineer in FNI’s Water/Wastewater Master Planning group. She has assisted with development of system models for water and wastewater master planning, CIPs, impact fee studies and FNI’s unidirectional flushing programs, which enable municipalities to resolve water quality and water aging issues. Her experience also includes water transfer systems for hydraulic fracturing and crude oil hydraulic modeling. Ms. Bondar has also performed risk-based hydraulic priority renewal programs using wastewater models, GIS and CMMS data sources. Her relevant project experience includes:

- **Long Range Water Plan, City of Liberty – Assistant Project Manager.** Development of water model, future populations and water demand projections; evaluation of distribution system’s ability to serve the future water service area; evaluation of the benefits of developing a reuse system to reduce system water demands; sizing of pump stations and ground and elevated storage facilities; determination of water transmission and distribution needs; and comprehensive water system CIP development.

- **Asset Management for District Facilities, Fort Bend County Levee Improvement District 2 – Assistant Project Manager.** Data and systems evaluation and gap analysis; asset management implementation plan for levees, pump stations and gate structures incorporating asset inventory and mapping, condition assessment, criticality analysis and risk-based process to develop a business case prioritized CIP.

- **Wastewater Master Plan, City of Kerrville – Project Team.** Development and calibration of wastewater model, future population and wastewater flow projections; wastewater treatment plant condition and capacity assessment; and development of an integrated wastewater treatment plant and collection system CIP.

- **Unidirectional Flushing Program, Multiple Cities – Assistant Project Manager.** Development of unidirectional flushing program map books and flushing procedures using ArcGIS. Field implementation and data collection for the City of Corpus Christi. Analysis of water and cost savings for the cities of Pearland, Corpus Christi, Garland and Grand Prairie.
David Jackson, P.E., BCEE

David Jackson is an FNI Vice President/Principal and Manager of the Water/Wastewater Treatment and Reuse Group. He specializes in wastewater/water treatment design, construction and facility planning and has designed more than $330 million in treatment facility construction during his career. His relevant project experience includes:

- TRA Central Regional Wastewater System (CRWSS) Treatment Plant (162 MGD) Trinity River Authority of Texas – Project Manager/Principal-in-Charge. Ten separate projects totaling more than $93 million in treatment plant renovation and expansion projects. Projects included design of a 156-MG Peak Flow Management System, 220-MGD coarse and fine screening facilities, renovations to 210 MGD of RAS/WAS pumping facilities, disinfection improvements, aeration improvements, energy reduction, nutrient evaluations and overall plant master planning.
- The Colony WWTP Expansion (3.5 MGD) City of The Colony, Texas – Project Manager and Engineer. Four projects at the WWTP, including the design of $11 million in improvements, including expansion of the plant to single-stage nitrification, using Integrated Fixed Film Activated Sludge (IFAS) and enhanced biological phosphorus removal.
- Big Spring Raw Water Production Facility (1.8 MGD) Colorado River Municipal Water District of Texas – Principal-in-Charge. Design and construction management of CRMWD’s new Raw Water Production Facility. The $12-million project is one of the first facilities in North America to provide direct potable reuse and the first in Texas. The project has been featured in numerous national conferences, articles and publications.
- Pierce Burch WTP (75 MGD) City of Arlington, Texas – Project Manager. Multiple projects at the Pierce Burch WTP. Projects included design of scrubber system improvements; water line and stormwater drain improvements; modifications to the sedimentation basin and wastewater return systems; ozone system hydraulic and filter designs; and plant master planning.
- Ray Roberts WTP (20 MGD) City of Denton, Texas – Project Manager and Engineer. Design and construction of a new 20-MGD WTP. The $37-million project included a raw water pump station, sedimentation basins, intermediate ozone disinfection, self-backwashing filters, wastewater reclamation basin, ground storage, high service pumping and a new operations/administration building.

Leonard Ripley, Ph.D., P.E., BCEE

Leonard Ripley is FNI’s lead wastewater process engineer, treatment operations troubleshooter and a firm Associate. His experience includes design of municipal wastewater and water treatment plants and industrial wastewater treatment facilities, as well as specialized services such as treatability studies, start-up assistance and peer reviews. Dr. Ripley designed and manages FNI’s treatment process laboratory in our Fort Worth headquarters, and he has two wastewater treatment patents. He is the technical lead on all of FNI’s emerging technology projects, including hybrid wastewater treatment, energy reduction/conservation and several waste-to-energy facilities. He also aids cities with troubleshooting and operations assistance. He has assisted industrial clients from California to Minnesota to Virginia. Some of his relevant experience includes:

- Village Creek Wastewater Plant Energy Conservation Program (sub to Johnson Controls, Inc.), City of Fort Worth – Process Engineer. Design of aeration basin anoxic zones that have reduced the plant’s aeration energy demand by roughly 15 percent. Also design of a dedicated co-digestion facility to receive and convert high-strength wastes to methane. The additional methane allows the plant to generate enough electricity and high-pressure steam to satisfy most of its energy requirements.
- New Broadway WWTP Process Selection, City of Corpus Christi – Process Engineer. Process Peer Review for the overall design, including process design, equipment selection, constructability review and participation in the development of the Opinion of Probable Construction Cost of the 8-MGD WTP.
- River Road WWTP Anaerobic Digestor Improvements, City of Wichita Falls – Process Engineer. Multistage co-digestion rehabilitation of a 19.9-MGD WWTP digestion system and the reduction of energy consumption while increasing production from the digestion system, reducing the plant’s operating costs.
- Wastewater Master Plan Update, City of Kerrville – Lead Process Engineer. The Wastewater Master Plan update for 2012 included a WWTP condition and capacity analysis, an update of their wastewater collection system capital improvement program, and an integrated capital improvement plan that included a recommended alternative for both the City’s treatment and collection system.
OUR TEAM

Water/Wastewater Professionals

Robert Vinay, P.E.

Robert Vinay is a hands-on Project Manager with 35 years of experience working on large, complex water/wastewater projects throughout North Carolina, complementing our growing team in the region. A North Carolina native, Mr. Vinay offers significant experience and expertise in the planning, detailed design, and construction of water/wastewater treatment, utilities and pump station projects. He also has a wealth of experience in funding and regulatory compliance in North Carolina. His relevant experience includes:

- Dempsey E. Benton Water Treatment Plant, Backwash Waste Clarification System – Project Manager and Lead Designer. Design, permitting and construction of a 4.0 MGD filter-backwash wastewater treatment system, consisting of dual 2 MGD dissolved air flotation (DAF) clarifier units, an influent pumping station, chemical feed facilities for DAF aid polymer, dechlorination and pH adjustment, system, ultraviolet disinfection system, and approximately 1,540 linear feet of 24-inch gravity effluent outfall.
- Raw Water Supply Improvements, Town of Cary – Project Manager. Engineering study and designs to increase the Town’s Jordan Lake raw water pumping capacity from 16 MGD to 50 MGD. The project included six miles of 42-inch transmission main, three new 15 MG D variable speed vertical pumps, a building annex to house associated electrical switchgear and control equipment, SCADA improvements, stand-by generator equipment. Raw water pumping design included a hydraulic model study that resulted in requirements for anti-vortex devices to be installed on each of the new pumps.
- Western Wake Regional Water Reclamation Facility, Town of Cary – Project Engineer and Project Manager. Project included a new 18 MG D water reclamation facility in southern Wake County. Treatment process facilities include influent screening and grit removal, biological nutrient removal, conventional clarification designed for future conversion to MBR, tertiary filters, UV disinfection, and post-aeration. Solids handling facilities consisted of aerated holding tanks, gravity belt thickeners and centrifuges.
- Westbrook Pump Station and Force Main, City of Goldsboro – Project Manager. Planning, permitting and design of an upgrade and expansion to the Westbrook Pump Station and 42 inch force main to serve the Water Reclamation Facility. The project included additional pumps to attain a firm capacity of 34 MG D, associated piping, electrical and control improvements, and improvements to the mechanical bar screen structure. The force main included a subaqueous crossing of the Neuse River.

Trooper Smith, P.E.

Trooper Smith is an FNI Principal and Central Division Water Resources, Treatment and Utilities Group Manager. His background includes water and wastewater plant design, process evaluation, and plant operation and maintenance; sludge handling and disposal facilities; pump design; industrial wastewater treatment facilities; construction management services; and program management services. A former U.S. Army engineer in Iraq, Mr. Smith has experience in managing large, multi-discipline project teams to complete large-scale, complex projects. His relevant project experience includes:

- Central Regional Wastewater System Pump Stations 13/13B and Equalization Basin Improvements, Trinity River Authority of Texas – Project Manager/Project Engineer. Design and construction services for $24-million project that included a new innovative self-cleaning trench-type wet-well Pump Station 13B (50 MG D RAS/WAS Pump Station), partial rehabilitation of Pump Station 13 (68 MG D RAS/WAS Pump Station) and addition of flexibility required for RAS/WAS distribution at the north plant. Mr. Smith was responsible for the pump station design.
- Southton Road Emergency Sewer Project, San Antonio Water System – Project Manager. Design of 4,800 linear feet of 48-inch gravity sewer main replacement. This $2.4-million project included a double barrel siphon, hydraulic modeling, roadway design and traffic control phasing. The emergency project was designed in three weeks with construction to be completed in 90-days and is the largest emergency project in SAWS history.
- Kerrville WWTP Improvements, City of Kerrville – Project Engineer. CIP development for the Kerrville WWTP as part of a Comprehensive Wastewater Master Plan. The CIP was risk-based and prioritized with the facilities that were the highest risk first. The need for an additional final clarifier and to rehabilitate the plant electrical system were identified as the highest risk for the plant to meet all of its treatment goals. FNI is designing a new final clarifier and electrical system for the WWTP and will provide bid and construction phase services.
- Wastewater System Evaluation and Master Plan, City of Terrell – Project Engineer. Comprehensive wastewater system evaluation and master plan to address the existing system’s deficiencies of their collection system and WWTP capacity and non-compliance issues with TCEQ. FNI also performed a feasibility analysis for rehabilitation of the existing WWTP or joining a regional wastewater treatment and conveyance system.

Experience

35 years

Education

B.S., Civil Engineering, North Carolina State University

Registration

Professional Engineer, North Carolina 030978

Professional Engineer, South Carolina #21148

Experience

13 years

Education

Master of Engineering, Environmental Engineering, Texas Tech University

B.S., Environmental Engineering, Texas Tech University

Registration

Professional Engineer, North Carolina 044658

Professional Engineer, Texas #92669

Papers/Presentations

In November 2010, FNI was named a recipient of the Malcolm Baldrige National Quality Award, the first and only engineering/architecture firm to receive this honor. The award provides affirmation of our 15-year quality journey to develop FNI into a Baldrige-class firm.

The Baldrige award is the highest presidential honor given to U.S. organizations for performance excellence. It was established in 1987 to enhance the competitiveness of U.S. businesses in an ever-expanding, demanding global market. The Baldrige program promotes excellence in organizational performance, recognizes the achievements of U.S. organizations and publicizes successful performance strategies.

Quality Control/QA methodology is supported by our internal Technical Excellence Program and rooted in a system of formal checklists, meticulous analysis and planning, design and construction excellence to help produce quality deliverables for our clients.

Quality Control/Quality Assurance Program

Quality Control
Quality Control (QC) at FNI involves technical review of all project components to determine accuracy and readability of studies, verify design calculations and details, and check constructability of construction documents. FNI considers QC to be the ongoing responsibility of each team member, but formal QC reviews will be led by the project-specific QC/QA Manager at key milestones throughout each project. The goal of a QC review is to check for sound technical principles and accuracy. Most reviews are multi-disciplinary, and those with construction adjuncts are also reviewed for constructability.

Quality Assurance
Quality Assurance (QA) at FNI is an overall project review to determine that an effective approach is taken for a project, confirm project objectives are carried out, detect conceptual problems early, and verify that coordination and the QC functions and reviews have been performed. The QC/QA Manager will take responsibility for administering the QA process by submitting the appropriate information and materials to a QA Leader, who will be assigned by FNI’s Office of the President and be responsible for conducting a formal QA review after each formal QC review.
For more information, please contact:

**Mike Wayts, P.E., CFM**  
Division Manager  
Office: 919-582-5860  
Mike.Wayts@freese.com

**Charles Archer**  
Account Director  
Office: 919-582-5861  
Charles.Archer@freese.com

www.freese.com/northcarolina