Harold B. Till, PE

Managing Engineer

TECHNICAL EXPERTISE

- Pipeline design
- Water supply lines
- Wastewater collection and conveyance
- Facility permitting
- Environmental assessment
- Storm water collection, detention and drainage
- Water and wastewater pumping stations
- Industrial facilities and roadway design

PROJECT ASSIGNMENT

YEARS OF EXPERIENCE

With O'Brien & Gere: 34
With Other Firms: 11

EDUCATION

BCE/1958/Civil Engineering; Tri-State University

PROFESSIONAL REGISTRATIONS

Professional Engineer: NY, CA

PROFESSIONAL PROFILE

Mr. Till has more than 45 years of professional engineering experience and provides supervision as well as technical expertise for the planning, design, and construction of projects involving all types and sizes of pipelines to convey water, wastewater, steam and gas. He has provided project management, design and construction supervision of wastewater collection, transmission and treatment. He has also designed and served as design reviewer for drainage facilities, new community development, highways and railroads. He also has experience with project management, design and construction supervision for all types of water supply projects.

As a Managing Engineer with O'Brien & Gere, Mr. Till maintains fiscal responsibility, technical accuracy, and efficient completion of projects under his control. He provides quality review of designs, reports, written opinions, and other documents. He is also responsible for continuous follow-up on client relations and maintains personal contact with the client throughout the duration of a project and following project completion.

REPRESENTATIVE PROJECTS

NATURAL GAS TRANSMISSION FACILITIES:

Experience includes studies, planning, design, and preparation of contract documents for various natural gas transmission/distribution projects. Representative projects include:

Project Orange Associates, L.P., Onondaga County, NY – Preliminary design, easement acquisition, and preparation of final design plans and specifications for the turnkey construction of approximately 52,000 lf of 12 inch diameter, 800 psi natural gas transmission pipeline required to convey fuel gas to a proposed cogeneration facility to be constructed in downtown Syracuse, NY.

New York State Electric & Gas, Binghamton, NY – Provided technical review for a major off-peak storage and gas transmission project. Major project tasks included:

> Prepared blasting specification for the construction of approximately 35-mile natural gas transmission pipeline.
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> Prepared detailed plans for approximately 15 streams crossed by 35-mile natural gas transmission pipeline. Included coordination with regulatory agencies and construction and restoration methods.

Niagara Mohawk Power Corporation, Syracuse, NY – Provided consulting services to Niagara Mohawk Gas Engineering in accordance with a continuing services agreement. Representative projects to date include:

The design of a 50 million ft^3/day flow control/pressure regulating "gate" station at a new point of connection to the Iroquois Gas Transmission System.

The design of remedial measures to address erosion/third party impacts at various locations along existing Niagara Mohawk right-of-ways.

St. Lawrence Gas Co., Massena, NY - Developed a pre-blast investigation report for the proposed construction of 12 miles of 8-inch diameter gas pipeline. The report outlined potential blasting program requirements, safety measures, and identified probable areas of impact based on the results of laboratory tests conducted on rock cores and field reconnaissance of the pipeline alignment. The report was required by the New York State Public Service Commission as part of the Environmental Management and Construction Plan.

Berkshire Energy Group, Ltd., Genesee Co., NY - Preliminary design and route selection for approximately 58,000 lf of 8-inch diameter, 475 psi natural gas transmission main as required to supply fuel gas to a proposed cogeneration facility being constructed in Batavia, NY.

Power City Partners, Inc., Massena, NY – Preliminary design of approximately 8,500 lf of 8-inch diameter, 500 psi natural gas pipeline to supply fuel gas to a proposed cogeneration facility to be constructed at the Alcoa plant site in Massena, NY.

Cogen Energy Technology, Inc., Castleton-on-Hudson, NY - Developed recommended construction methods for the installation of a 6-inch diameter, 400 psi natural gas pipeline through a steep slope area exhibiting unstable soil conditions. The pipeline was being constructed by the local distribution company to provide fuel to a 60 MW Cogeneration facility.

WATER TRANSMISSION, DISTRIBUTION, STORAGE:

Cayuga County Water and Sewer Authority, Cayuga County, NY - Planning of preliminary design/final design, and construction phase services for the installation of 63,000 lf of 12-inch water transmission lines within Cayuga County. The project provides water to several areas currently on wells. Approximately 50,000 lf of water main was constructed within the right-of-ways of NY State highways, replacing a 60-year old cast iron pipe, from the City of Auburn to the Village of Port Byron. As part of this project residences adjacent to the alignment were provided service. Construction inspection services including survey, coordination with involved agencies and property owners, and coordination with the client, design staff, and contractor.

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Cayuga County, NY – Assistance to the Cayuga County Water and Sewer Authority with formation of water districts in accordance with Article 5-A of county law.

Town of Oswego, NY – Fast-track design of 57,000 lf of 12- and 16-inch water transmission main. Work involved crossing sensitive wetlands, streams, and agricultural lands, and included railroad and major roadway crossings.

City of Oswego, NY - Analysis of the condition of an existing raw water intake to serve an industrial complex. This project involved detailed hydraulic analysis and impacts on existing pumping facilities.

Rochester, NY – Planning, design and permitting for a water intake and outfall into the Genesee River. The piping into the river consisted of 200 ft of ductile iron ball and socket pipe with special emphasis on anchoring the pipe to the bottom surface of the river to resist turbulent flows. This project also involved complex hydraulic analysis and an accelerated schedule.

Howard County, MD – Design of 18,000 lf of 36-inch diameter water main including evaluation of steel and ductile iron pipe. Technical design for the route alignment study for approximately 6,000 lf of 48-inch transmission main paralleling Route 29 between Route 108 and Route 103. Conducted an evaluation for the use of PCCP on the project.

Washington Suburban Sanitary Commission, Laurel, MD - Alignment study for 30,000 lf of 48-inch diameter water main through a congested urban area. Project included detailed evaluation of several alignments and concentrated public participation program.

County of Oswego, NY – Preliminary design of 14,000 lf of 24-inch water transmission to serve a cogeneration facility in upstate New York. This project involved route selection, evaluation of the type of pipe material, and detailed project cost estimates to be used for a design build proposal.

Erie County Water Authority, Buffalo, NY - Preparation of a design manual to be used by the Authority's staff and outside consultants to plan, administer, design and construct new and/or rehabilitated water mains.

Metropolitan Water Board, Clay, NY - Planning and preliminary design of a 100 MG raw water intake in Lake Ontario, a 9-ft diameter rock tunnel, approximately 6,000 ft long, with 120 ft deep, 12-ft diameter access shaft. Intake was part of a regional water supply system consisting of water transmission, distribution and storage facilities including 25 miles of 16-inch through 60-inch diameter pressure pipe, a 100 MG earthen berm reservoir and four prestressed concrete tanks. This project also involved the design of

two 48-inch diameter pipeline crossings of the Seneca River and several major highway crossings.

State of California Department of Water Resources - Design and inspection of water conveyance structures including dams, large diameter pipelines and open channel conveyance facilities. Responsibilities also included comprehensive soils analysis and construction material testing.

Philadelphia Electric Company, Philadelphia, PA - Design of 36,000 lf of 42- and 48-inch diameter cooling water transmission line for a nuclear power plant.

Town of Camillus, NY - Design of a water system for a 200 acre planned community.

City of Pittsfield, MA - Design consultation for the material selection, structural design and cost analysis of pipe material alternatives for approximately 8,000 lf of 30-inch main water supply line.

Monroe County, NY - Design of seven miles of 16- and 24-inch diameter water transmission main with interstate highway crossings, and a 1 MG steel water storage tank.

Hudson River, NY - Design of a 4-ft diameter ductile iron pipe intake for a pumping station.

County of Onondaga, NY - Design of 2 MG prestressed concrete tank.

State of California Department of Water Resources - Planning, design, supervision of construction and operation of a 1200 ft by 40 ft prototype model of the California Aqueduct to test construction methods and materials of construction for the $2 billion California Aqueduct.

State of California Department of Water Resources - Design of intake structure for a 1,200 cfs pumping station.

State of California Department of Water Resources - Design of thrust restraint and pipe for 108 inch steel transmission mains.

New York State Urban Development Corporation - Design of 15 miles of water distribution system including a package chlorination facility.

Water and Sewer Authority (WASA), Washington, DC - Directed design of deadend eliminations, the interconnection of existing "deadend" watermains to improve water quality.

Water and Sewer Authority (WASA), Washington, DC - Review of water main discharge standards and cleaning and lining specifications.

Water and Sewer Authority (WASA), Washington, DC Directed design of 10,000 lf of 8- to12-inch main.

Water and Sewer Authority (WASA), Washington, DC Technical advisor on major transmission main repair/replacement.

WASTEWATER, MUNICIPAL:

North Chautauqua Lake Sewer District, Mayville, NY – Completed planning, district formation, and subsequent design of regional collection system consisting of 37,000 lf of gravity collector sewers, 16,000 lf of pressure collector force mains, 13,200 lf of conveyance force main, 135 grinder pumping stations and eight major pumping stations.

City of Jamestown, NY – Prepared design of rehabilitation techniques for major transmission mains, and sewage pumping stations and solids handling facilities. Design of two 125-ft diameter final clarifiers, a 48-inch diameter outfall, and an aeration system for the existing rotating biological contactors (RBCs).

City of Jamestown, NY – Completed facilities planning and Construction Design Review of the upgrading of the City's existing 8 MGD wastewater treatment plant and rehabilitation of sanitary sewer system. Design of two pumping stations; 12,000 lf of 24- to 42-inch force mains; and rehabilitation of 2,100 ft of 21-inch sewer by inserting an 18-inch polyethylene pipe. Sewer System Evaluation Survey of 150 mile collection/conveyance system with pipe sizes ranging from 6- to 48-inches diameter.

City of Jamestown, NY - 1100 ft of 8-inch sewers with grinder pumping station.

City of Jamestown, NY - Renovation of two existing above-ground pumping stations, .9 MGD and 2.2 MGD respectively, including the mechanical, electrical, heating and ventilating and plumbing demolition and renovation work.
City of Jamestown, NY - Final design of a 2 MG earth and clay lined sludge holding lagoon and entrance road for the city's wastewater treatment plant.

Chautauqua Utility District, Chautauqua, NY - Design of odor control, pumping equipment, rotating biological contactor treatment units, sewage retention facilities and sanitary sewer rehabilitation.

South and Center Chautauqua Lake Sewer Districts, NY - Prepared a Facilities Plan for 14 miles of lakeside development of approximately 50 miles of sewage collection and conveyance systems consisting of combinations of low pressure grinder pumping

units, vacuum units and gravity systems. Also considered were the use of alternatives to centralized treatment such as waterless toilets, improved septic systems, and cluster treatment systems utilizing package treatment plants and community leach fields.

Onondaga County, NY - Design of 36,000 ft of 42-inch sewage force main, 2,700 ft of 48-inch diameter sewer in the City of Syracuse supported with 50-ft long poles, and a 30 MGD sewage pumping station.

City of Niagara Falls, NY - Design of 48-inch interceptor sewer including mat and cradle foundation.

New York State Urban Development Corporation - 15 miles of sewers, four sewage pumping stations and a 300,000 gpd package type treatment plant.

Massachusetts Port Authority – 3,400 ft of 18-inch and 30-inch diameter sewers on piles.

Rochester Pure Waters District, Rochester, NY - Renovation of two existing screenhouse structures, each upstream of an inverted siphon approximately 100 ft deep, and 500 ft long. The capacity of each structure is 65 MGD. Internal renovation of the existing screenhouse required replacement of all mechanical, electrical, heating, ventilating and plumbing items.

Rochester Pure Waters District, Rochester, NY Final design for six overflow diversion structures for the City of Rochester's combined sewer system. The structures were designed within existing tunnels of about 8 ft in diameter and included use of sluice gates and/or inflatable dams. The system was designed to divert flows in excess of existing sewer capacity during peak storm periods.

New York State Office of General Services - Facilities planning for the rehabilitation of 8 miles of sewers, a sewage pumping station and wastewater treatment plant.

PROFESSIONAL AFFILIATIONS

American Society of Civil Engineers
American Water Works Association
Water Environment Federation

O'BRIEN & GERE COMPANIES

From problem definition & engineering to full implementation & operation

Environmental Compliance and Remediation

- Air quality / pollution control
- Asbestos / Lead paint management
- Bioremediation
- Decontamination / Decommissioning
- Due diligence
- Ecological services
- Environmental site assessments
- Environmental management systems
- Expert testimony
- Geoenvironmental design
- GIS / Data management
- Ground water remediation
- Hazardous waste management
- Indoor air quality
- Industrial hygiene
- ISO 14001 training & implementation
- Laboratory analysis
- Landfill design and closure
- Modeling
- Natural resource damage assessment
- O&M
- Permitting & compliance audits
- Pilot / R&D programs
- Pollution prevention
- RCRA & CERCLA programs
- Remedial design / Remedial action
- RI/FS and RFI/CMS
- Risk assessment
- Site investigations
- Soil remediation
- SPCC
- Strategic environmental management
- Superfund programs
- Waste stabilization / solidification
- Wetlands

Facilities

- Architectural design
- Asbestos / Lead paint abatement
- Boilers / Chillers
- Bulk storage tanks
- Caretaker / Site management
- Central heating / Cooling systems
- Chemical supply, storage & distribution systems
- Code review
- ContamAway® surface cleaning
- Demolition
- Electric power supply & distribution
- Equipment design & fabrication
- Expansion / Upgrades
- Facility layout / Space planning
- Facility reuse / realignment
- Fire protection / detection
- Foundations / Geotechnical programs
- HVAC
- Instrumentation & control
- Lighting - interior / exterior
- Mechanical systems
- Operations, surveillance, & maintenance (O&M)
- Piping & instrumentation diagrams (P&ID)
- Piping systems
- Plumbing
- Process line upgrades
- Safety assessments
- Structural engineering
- System controls
- Telecommunications
- Utility systems

Site Development / Redevelopment

- Approvals
- Brownfields site redevelopment
- Drainage systems
- Earthwork analysis
- Environmental assessments
- Environmental impact statements
- Erosion & sediment control
- Feasibility studies
- Landscape architecture
- Lighting plans
- Master planning
- Pavement analysis / Design
- Permitting
- Public presentations / participation
- Regulatory compliance & negotiations
- Retaining walls
- Right to build
- Site access / Roadways
- Site evaluations
- Site planning & layout
- Storm water management
- Traffic analyses
- Utilities
- Wetlands mitigation
- Wireless site development
- Zoning evaluations & changes

Wastewater Management

- Biological nutrient removal
- Collection & conveyance
- CSO / SSO
- Competitive assessments
- Facilities planning
- Financial planning
- Instrumentation & control / SCADA
- I/I, SSES
- Interceptors / Trunk sewers
- Laboratory analysis
- Leak detection
- Master planning
- Modeling
- Nutrient control
- O&M
- Permitting
- Pilot / R&D programs
- Plant upgrade & expansion
- Process design
- Pumping stations
- Rate studies / Cost of service
- Regulatory compliance negotiations
- Residuals management
- Sanitary sewer overflow
- Sewer rehabilitation
- Storm water management
- Total maximum daily loads
- Treatability
- Treatment / Pretreatment
- Trenchless technology
- Trunk sewers
- Water reuse
- Watershed management
- Zero discharge

Water Resources

- Advanced treatment systems
- Competitive assessments
- Dams & reservoirs
- Facilities planning
- Financial planning
- High purity water systems
- Instrumentation & control
- Intake structures
- Laboratory analysis
- Leak detection
- Master planning
- Modeling
- O&M
- Operational reviews
- Permitting
- Pilot / R&D programs
- Plant upgrade & expansion
- Pumping stations
- Rate studies / Cost of service
- Regulatory compliance negotiations
- Residuals management
- SCADA
- Storage
- Supply, surface & ground water
- Transmission & distribution
- Treatment
- Water quality
- Watershed management
- Wellhead protection

Project Management

- Claims consulting
- Construction
- Construction management
- Contract administration
- Contracting / Subcontracting
- Design
- Design / Build / Operate
- Document control
- Estimating
- Health & safety
- O&M planning, O&M manuals
- Project controls
- Project delivery
- Project execution planning
- Project / Program management
- Scheduling
- Start-up / Commissioning
- Training
- Turnkey

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FEATURED EXPERIENCE

To highlight O'Brien & Gere's experience and knowledge, the following has been included in this section for your review:

Featured Projects

- NYSEG Seneca Lake Storage Project
- Power City Partners Natural Gas Pipeline Project
- Project Orange: Natural Gas Pipeline
- National Fuel Gas Pipeline Development
- Fort Orange Natural Gas Pipeline

Abstract: "Evaluation of stream crossing methods prior to gas pipeline construction"

Fact Sheets:

- Wetlands
- Environmental Impact Analysis
- Habitat Assessments
- Ecological Risk Assessments

Corporate Line Card

As Section 1 of this submittal demonstrates, O'Brien & Gere offers services for many industries. The line card at the end of this section outlines these services. More information is available upon request.

NATURAL GAS PIPELINE CONSTRUCTION

INTRODUCTION

O'Brien & Gere offers clients construction-phase services in the areas of utilities (public and private) installation, industrial facilities, site development, hazardous waste management, and construction management services. As a team, O'Brien & Gere addresses a project's many technical and regulatory requirements and understands how these issues relate to successful project completion. The firm's innovative concepts have benefited clients with project cost savings.

GENERAL CONTRACTING AND CONSTRUCTION MANAGEMENT

Relative to the firm's contracting and construction capabilities, O'Brien & Gere has provided construction-phase services for over 200 clients. Firm personnel have participated in projects ranging from small excavation projects to larger ($10 million) design/build projects.

The scope of each project varies with the client's goals and willingness to be involved in various phases of the project. Upon the definition of feasible management goals, O'Brien & Gere helps the client meet the challenges posed by difficult construction problems.

O'Brien & Gere's success in the construction management field is founded upon basic precepts of business established nearly 50 years ago, and a solid base of expert professionals with the ability to apply innovative technologies and state-of-the-art project management tools.

RESULTS-ORIENTED TECHNIQUES

Applying a systematic approach to each project, O'Brien & Gere works within budget while mapping an effective plan of organization, timing and control. The firm's ability to work with and understand regulatory agency requirements detailed in the Environmental Management and Construction Plan (EM&CP) and to provide the client with a successful project under string-out inspection requirements is well-documented. Understanding and complying with requirements of state, county and township highway, authorities, property owners, environmental groups, etc., is critical when constructing miles of pipeline.

EXPERIENCE

O'Brien & Gere has experience in the installation of fuel gas pipelines and other utility related projects. Following are brief descriptions of several pipeline projects where construction services were provided by O'Brien & Gere.

Project Orange Gasline

A 9.3-mile natural gas transmission pipeline installed to a private cogeneration plant site. Twelve-inch (12") APT 5L-Class 42 double random pipe was installed in very difficult terrain (rock, wetlands) and crossing county, state, private university property, a cemetery, and under a railroad. The pipeline was successfully tested at 1200 psig. Odorization facilities and instrumentation control and monitoring of the pipeline was also included.

Reichold Chemical Corporation

Relocation of existing high- and low-pressure steam and inert gas pipelines. Installation of pipe trestle, foundations, pressure reducing valves and expansion loops for stream piping.

Brittonfield Services, Inc.

Installation of approximately 8,000 lf of sanitary sewer including appurtenances and successful testing. Installation of site lighting, roadways, and concrete gutters.

J.T. Baker, Inc.

Installation of approximately 6,000 lf of 42" concrete storm water piping. Coordination with and relocation of conflicting in-ground utilities.

TRW, Minerva

Installation of approximately 6,000 lf of 3", 4", 6" and 8" ductile iron force main in city streets. Included street borings and two (2) stream crossings.

NATURAL GAS PIPELINE DESIGN

INTRODUCTION

Typically fuel gas, such as natural gas or propane, is transported from its source through intra- or interstate transmission pipelines to distribution systems or storage facilities which serve individual customers. Fuel gas utility companies meet increasing demands by expanding supply capabilities. This may be accomplished through connecting to existing transmission pipes or by constructing transmission facilities to meet their distribution system. In addition, new pipelines may be required to supply a reliable source of fuel to large consumers such as power plants, cogeneration facilities and other privately developed projects. New pipelines can be established as extensions of existing distribution networks, new distribution lines connected to existing transmission systems, or new transmission pipelines to bring fuel from sources outside of the immediate project area. O'Brien and Gere offers a variety of engineering services in connection with the implementation of new fuel gas pipeline projects including route selection, land acquisition, and pipeline design.

PIPELINE ROUTING AND LAND ACQUISITION

Often the first step in developing a pipeline project is the selection of an appropriate route for the pipeline to follow. Route selection depends on a number of factors, including the locations of the origin and endpoint; terrain; sensitive resources; existing rights-of-way; and demography. The route selection process includes consideration of these factors, with emphasis on environmental impacts and constructability, to locate the most practical route.

Consideration of these factors is accomplished through review of available background information and maps; site visits; identification of a preliminary route or corridor; contacts with appropriate agencies, utilities, and landowners; and a review of environmental resource considerations. Based on this information an evaluation of alternatives is performed, and route adjustments can be made based on that evaluation.

Once the route has been selected, land must be acquired to install the pipeline. The land acquisition requirements are identified and their impact on the route selection is assessed. Permanent and temporary easements or rights-of-way are negotiated and purchased. Finally, the selected route is "fine-tuned" through detailed site visits focusing on environmental impacts, access, and constructability.

DESIGN SERVICES

Design services provided in connection with fuel gas pipeline design are generally provided in two steps. The first step, preliminary design, includes those activities necessary to define the scope of the project and obtain necessary regulatory approvals. The second step, final design, is typically initiated after the regulatory approvals are obtained and includes activities necessary to develop the detailed design of the proposed pipeline and its appurtenances as required to construct the proposed facilities.

Preliminary Design

Preliminary design services typically include feasibility studies, selection of the most cost effective and environmentally compatible pipeline route, coordination with the pertinent regulatory agencies, coordination with the fuel transportation company to establish the design parameters at the proposed point of connection, determination of the required pipeline hydraulic characteristics, identification of required pipeline appurtenances (i.e., isolation valves, pig launchers, etc.) and gas treatment facilities (i.e., filters, compressors, meters, regulators, odorizers, etc.), development of preliminary pipeline plans which indicate the proposed route, preparation of outline specifications, and development of a preliminary cost estimate.

Preliminary design may also include technical support in the permit process. Since, many aspects of the permit process include technical matters, specific design issues must be addressed during permit review.

Final Design

Final design services are required to develop the detailed information necessary to construct the proposed facilities. Final design activities include confirmation of pipeline hydraulics; selection of materials; identification of construction requirements; design of specialized features such as automated control and emergency shut down systems, compressor stations, metering facilities, and pressure regulating facilities; preparation of detailed plans and specifications; development of contract documents as required to solicit competitive bids for the construction of the project; assistance during bidding, including evaluation of bids received and recommendation for contract award; contract administration including shop drawing review, field inspection, and design support of construction activities; preparation of Record Drawings; and development of operation and maintenance manuals.

EXPERIENCE

O'Brien & Gere has experience in the preliminary and final design of fuel gas pipelines in connection with several projects. Following are brief descriptions of several representative fuel gas pipeline projects.

Project Orange Associates, L.P.

A 9.3 mile natural gas transmission pipeline was designed and permitted for a private project developer. The pipeline is designed to provide fuel to an 80 megawatt cogeneration plant which will produce electricity for sale to a local power company and steam to be sold to an existing steam distribution system serving a university campus and several hospitals in the City of Syracuse, New York. Services provided include preliminary design; preparation of application materials and support throughout the review and approval process, resulting in issuance of a certificate approving the project; development of detailed design information and environmental management practices; and turnkey construction services.

Power City Partners, P.C.

This project involved preparation of preliminary design information and application materials for a 1.6 mile natural gas transmission line to serve a cogeneration plant located on an industrial site in northern New York State. The pipeline received certification from the Public Service Commission within two months of application submittal.

Berkshire Energy Group, Ltd.

This project involved the development of preliminary design information and application materials for an 11.2 mile natural gas transmission line to serve a cogeneration plant under construction in western New York State. The project was originally initiated by the cogeneration developer, and was transferred to the utility once negotiations between the two parties were concluded.

Confidential Client

A feasibility study was performed for a 34.5 mile natural gas pipeline which would bypass the local distribution company (LDC). The bypass was being considered due to the LDC's inability to meet the required project schedule. The study involved selecting the preferred pipeline route, considering construction and permitting factors; estimating the costs for construction; and assessing the project schedule, including a comparison of the state and FERC approvals processes. The interstate pipeline company involved was not willing to pursue the bypass, eliminating the FERC approval alternative. The client then elected to negotiate further with the LDC.

Cogen Energy Technology, Inc.

O'Brien & Gere was retained to study the feasibility and to develop recommendations for the design and construction of a proposed 6-inch diameter natural gas pipeline to be installed on steep side slopes exhibiting unstable soil conditions. The pipeline was proposed by the LDC to serve a proposed 60 MW cogeneration facility located in eastern New York state. This area was investigated as an alternative pipeline alignment in response to public concerns regarding the original alignment proposed by the local distribution company. The project included soil investigations, development of alternative design/construction methods (including estimated costs), and the preparation of a summary report. Close coordination was maintained throughout the project with the LDC and the New York State Public Service Commission.

NATURAL GAS PIPELINE PERMITTING

INTRODUCTION

Many states and the federal government have regulatory jurisdiction over the routing and design of fuel gas pipelines through permitting, approval, or certification processes which require a demonstration of environmental compatibility and public need for the projects. In many cases, these review processes provide for "one-stop" permitting, incorporating the requirements of a variety of agencies into one approval process. Sometimes additional permits or approvals are involved, for work in wetlands (U.S. Army Corps of Engineers), road crossings, railroad right-of-way occupancy, or cultural resources clearance.

Generally, the permitting process involves agency and public review of the following information:

- location of proposed pipeline route and identified alternative routes
- description of environmental resources in the vicinity of the pipeline route
- evaluation of potential environmental impacts and identification of construction practices/mitigation measures to be used to reduce impacts
- the need for the project
- preliminary design specifications

The application review process typically involves technical review of the project by agency staff, agency contacts with involved localities and affected individuals, a public comment period (often including a public hearing), and finally a determination whether to approve the project and development of permit conditions. Following project approval, detailed design information, including environmental management practices, is usually required prior to the start of construction. During the construction phase an environmental inspector must be provided to monitor compliance with the approved design and construction standards.

O'Brien & Gere has successfully completed permitting and related services for several projects, obtaining necessary local, state, and federal approvals in a timely manner for developers and utility clients. In addition, we apply our experience from having conducted routing evaluations permitting, design, construction, and construction oversight of literally thousands of miles of water, wastewater, and fuel transmission pipelines across the country. Many of the environmental implications of the route selection, environmental assessment, and permitting process are similar regardless of the nature of the pipeline.

PRELIMINARY ROUTE ASSESSMENT

The selection of a pipeline route involves environmental considerations as well as issues associated with constructability and land use. Where possible, the use of existing utility rights-of-way is preferred when establishing a pipeline route. This approach minimizes disturbance of new areas not previously committed to public use.

The selection of a pipeline route involves environmental considerations as well as issues associated with constructability and land use. Where possible, the use of existing utility rights of way is preferred when establishing a pipeline route. This approach minimizes disturbance of new areas not previously committed to public use.

Once a general corridor for the pipeline has been established, based on the supply and delivery points, an assessment is made of natural and human resources within the corridor to assist in the selection of a route which minimizes impacts to these resources. Preliminary route assessment for environmental resources incorporates a review of factors such as streams, wetlands, topography, vegetation and wildlife habitats, land use, agricultural activity, and cultural resource potential along the proposed route. These factors are evaluated in terms of how they would be impacted by, or would have an impact on, the permitting and/or construction of the pipeline. This evaluation is considered in concert with an engineering evaluation of factors related to design and constructability to select preferred and possible alternate routes for the project.

PERMITTING

O'Brien & Gere has developed a stepwise approach to the permitting and approval of fuel gas pipeline projects. This approach includes identification of required permits and approvals, gathering and review of background information, field investigations along the proposed pipeline route, preparation of application materials, support during the review and approval process, and preparation of environmental management and construction plans. The permitting process is conducted in close coordination with the client and with regulatory agency representatives to maintain a dialogue during agency and public review of the project.

Regulatory review

The construction and operation of fuel gas transmission lines is typically governed by "one-stop" permitting which incorporates the requirements of state and local agencies into a single review process. There may, however, be other permits and approvals not specifically included in the pipeline approval process under this umbrella. These could include highway and railroad crossings, and federal wetland permits, among

others. A regulatory review is conducted to identify required permits and approvals for the proposed project. In addition, application and review requirements are identified through regulatory research and interviews with appropriate agency or local government representatives. Where necessary, pre-application meetings may be held to clarify application needs. The result of this effort is a summary of permit and approval requirements, and review procedures including timeframes, which allows the establishment of a project review strategy and schedule.

Background Research

In preparation for field investigations of the proposed pipeline route, available existing background information regarding the location(s) of environmentally sensitive areas in a corridor surrounding the proposed pipeline route is gathered and reviewed.

Information to be reviewed typically includes:

- archaeologically sensitive areas
- historic sites
- geology
- scenic areas
- parks
- vegetation
- wildlife
- untouched wilderness areas

Such information is obtained through inquiries to federal, state, county, and local agencies (i.e., U.S. Army Corps of Engineers, state environmental regulatory agencies, state transportation departments, planning departments, regional and county parks agencies, historical societies, local museums), and through the review and interpretation of available maps (archaeological, USGS, etc.).

The purpose of this effort is to identify known resources and the potential for sensitive environmental resources to be present in the project area. This information provides documentation for the application materials and also aids in planning the scope of necessary field investigations.

Field Survey

Representatives from O'Brien & Gere walk the proposed fuel gas transmission line corridor to verify existing land use and inventory resources along the pipeline route. The field survey includes visual

review and verification of the environmentally sensitive areas identified during the background information review, as well as identification and cataloging of environmentally sensitive areas not identified by available existing information. Where appropriate, photographs can be taken to document the visual review. Information gathered as a result of the field survey includes the identification of vegetation, wildlife, and recreational activities, as well as the identification of state designated scenic highways, U.S. Army Corps of Engineer and state regulated wetlands, streams, cemeteries, and historic landmarks.

Special field studies are sometimes appropriate at this stage in the application preparation process. For example, a pipeline route planned to cross through designated or recognized scenic areas may necessitate a viewshed analysis to demonstrate that the cleared right-of-way for the pipeline will not harm scenic views in the area. In some cases rare, threatened, or endangered species habitats or cultural resources may be present in the project area, requiring detailed field studies. The scope of field investigations differs depending on each individual project configuration and setting, but it is often necessary to perform a detailed characterization of one or more sensitive resources.

Preparation of Application Materials

The fuel gas pipeline permit application typically includes a description of the environmental resources within the pipeline corridor, discussion of the environmental impacts associated with the construction phase of the fuel gas transmission line and applicable mitigation measures. Where impacts cannot be mitigated or avoided during the construction phase, restoration activities are identified. Appropriate handling procedures for explosive and/or hazardous materials are addressed to minimize the potential for employee and public exposure. Alternate routes are discussed. The environmental impacts and potential mitigating measures associated with the continued operation of the fuel gas transmission line are also addressed. Preliminary design and engineering information needed at this stage is often supplied by the client, or by O'Brien & Gere. Application package is prepared in accordance with regulatory agency requirements, and it is typically reviewed with agency representatives in an informal, pre-application meeting prior to formal submittal. These efforts help to build agency acceptance into the review process.

Approval Process

Depending on the length and nature of the fuel gas transmission line, the review and approval process can include rounds of questions from responses to participating regulatory agencies, public information meetings, public hearings, and formal evidentiary hearings. Because these activities can have a significant impact on the length of the review

process, as well as the conditions for approval of the project, the initial strategy for permitting should include identification of agency preferences and "hot issues" to be addressed during preparation of the application in an effort to minimize questions and hearing procedures during the approval process. For example, recent experiences in New York State with poor contractor practices along a large pipeline project have left state environmental and public service agency representatives very concerned about acquiring detailed environmental management and construction information prior to approval of new projects. Recognition of this concern during preparation of the application materials may streamline the review process and minimize delays. We keep up to date on these issues through regular contact with regulatory agency representatives, and through or permitting experience.

If necessary, other support provided during the approval process can include preparation of presentation materials, presentations at public meetings and public hearings, responses to regulatory agency questions and comments, preparation of notices and distribution of materials, expert testimony, preparation of materials for inclusion in hearing briefs, and other related tasks.

Preparation of Other Permits

In addition to the umbrella pipeline application, O'Brien & Gere can prepare other necessary permits and/or documentation required for approvals to construct and operate the fuel gas transmission line as identified during the regulatory review phase. Often, wetland permits and/or applications for areas identified as crossing U.S. Army Corps of Engineers wetlands are needed, or determinations can be made of the applicability of the Nationwide Permit Program to the project. The specific efforts to be conducted at this stage of the project are dependent on the needs identified previously.

ENVIRONMENTAL MANAGEMENT & CONSTRUCTION PLANS

Following approval, or certification in some states, of the fuel gas transmission pipeline route, detailed construction plans are often required so that the regulatory agencies can review the specific methods planned for construction and environmental protection measures.

Environmental management and construction plans (EM&CP) include:

- design drawings illustrating pipeline specifications
- utilities to be crossed or paralleled
- road crossings
- stream and wetland crossings

vegetation to be removed

width of the permanent and temporary rights-of-way

other pertinent information

The design plans are accompanied by a narrative report which includes:

specification detail drawings

general notes on construction practices

erosion and sediment control measures

slope stabilization practices

hazardous materials storage and handling

pruning and restoration techniques

special requirements such as double ditching through agricultural lands or landscaping plans for above ground structures

The EM&CP usually includes site specific descriptions of how the general construction practices will be applied along the pipeline route. This document is to be used by the construction contractor and the project sponsor to manage construction and restoration activities in an environmentally sound manner.

ENVIRONMENTAL MONITORING

During the construction phase, an environmental monitor, or inspector, is often required to oversee construction activities and monitor compliance with the provisions of the EM&CP. The environmental monitor can be a construction inspector trained in environmental management practices, or he can be an environmental scientist with training and experience in construction techniques. The environmental monitor works closely with both the contractor and regulatory agency representatives to interpret and apply the detailed information included in the EM&CP.

This role is important for several reasons:

to maintain compliance with regulatory agency requirements and approval conditions of the project

to effect construction of the project without undue disruption to sensitive environmental resources

to reduce construction impacts due to sedimentation and erosion

to maintain contact with property owners and others affected by the project during its construction phase

This role is often critical to the public and agency perceptions of a project long after it has been completed.

EXPERIENCE

O'Brien & Gere has successfully permitted several fuel gas transmission line projects, involving a variety of environmental conditions and issues. Some projects have involved EM&CP development, other permits, and environmental monitoring during construction.

New York State Electric & Gas Company (NYSEG)

O'Brien & Gere coordinated the field evaluation and potential impact report preparation which identified potential environmental impacts resulting from a proposed natural gas distribution system improvement program. Alternative routings for a pipeline extending from Ithaca to Binghamton, NY were evaluated. A routing was selected which minimized the potential environmental impacts while meeting the engineering objectives of the project. Special design considerations were developed to minimize the impacts associated with the crossing of several streams along the selected route.

Project Orange Associates, L.P.

A 9.3 mile natural gas transmission pipeline was designed and permitted for a private project developer. The pipeline is designed to provide fuel to an 80 megawatt cogeneration plant which will produce electricity for sale to a local power company and steam to be sold to an existing steam distribution system serving a university campus and several hospitals in the City of Syracuse, New York. Services provided include preliminary design; preparation of application materials and support throughout the review and approval process, resulting in issuance of a certificate approving the project; development of detailed design information and environmental management practices; and preparation for turnkey construction services to be provided by O'Brien & Gere.

Power City Partners, P.C.

This project involved preparation of preliminary design information and application materials for a 1.6 mile natural gas transmission line to serve a cogeneration plant located on an industrial site in northern New York State. The pipeline received certification from the Public Service Commission within two months of application submittal.

Confidential Client

This pipeline will carry propane about 250 miles from southwestern New York State to Montreal, Canada. O'Brien & Gere provided services for this project including regulatory requirement review, preliminary routing

studies, preparation of permit applications, environmental assessments, and support during the regulatory review processes.

Seneca Power Partners, L.P./National Fuel

This project involved the development of preliminary design information and application materials for an 11.2 mile natural gas transmission line to serve a cogeneration plan which is under construction in western New York State. The project was originally initiated by the cogeneration developer, and was transferred to the utility once negotiations between the two parties were concluded. O'Brien & Gere's services were provided to both parties, including route selection, preparation of the application materials, support during the regulatory review process, and development of environmental management practices.

National Fuel, New York

This project included an evaluation of alternative routes and preparation of application materials for a 2.5 mile natural gas pipeline to serve a proposed cogeneration facility in western New York State. Services provided included preparation of application materials, support of the application during the regulatory review process, consultation with investors and other project participants regarding the approval process, and preparation of detailed environmental management practices for use during construction and restoration activities.

St. Lawrence Gas Company, New York

This natural gas pipeline is approximately 12 miles in length, and it serves a cogeneration plant being developed in northern New York State. Services provided included route selection assistance, preparation of application materials, support of the application during the review process, and preparation of environmental management and construction standards for use during construction and restoration activities.

COnfidential Client

A feasibility study was performed for a 34.5 mile natural gas pipeline which would bypass the local distribution company (LDC). The bypass was being considered due to the LDC's inability to meet the required project schedule. The study involved selecting the preferred pipeline route, considering construction and permitting factors; estimating the costs for construction; and assessing the project schedule, including a comparison of the state and FERC approvals processes. The interstate pipeline company involved was not willing to pursue the bypass, eliminating the FERC approval alternative. The client then elected to negotiate further with the LDC.