



STATEMENT OF QUALIFICATIONS

INDUSTRIAL SERVICES

1. Summary of Expertise and Qualifications

Jacques Whitford NAWE, Inc. (NAWE) is a professional engineering firm, specializing in the evaluation, design, construction and operation of water treatment processes, with an emphasis on engineered ecological systems. The firm currently operates in the following service areas:

- Industrial treatment processes, including engineered wetland systems. NAWE has extensive experience in custom designing ecological systems to drive specific treatment reactions, including high-rate wetland systems, in-situ phytoremediation/bioremediation systems and engineered soil-matrix biofilters for liquid and/or gas phase contaminant removal. Specific projects to date have focused on landfill leachate, blast furnace slag leachate, BTEX-contaminated groundwater, petroleum contact water, cheese waste, barnyard runoff and milk-house waste. The firm holds several patents and patents pending on Forced Bed Aeration™ wetland treatment reactors, including U.S. Patents 6,200,469 and 6,406,627.
- Small community wastewater systems. NAWE has designed over 200 wastewater treatment systems for residential developments, resorts, schools and small municipalities and is a leader in the small flows/decentralized wastewater market. The firm provides assistance with all phases of projects, including facility plan development, engineering design; permit negotiations and construction observation. NAWE has worked with a number of federal and state grant and loan programs and provides grant administration and financial management services on publicly-financed projects. Our clients have won a number of awards for NAWE-designed wastewater systems, including the *1999 Minnesota Project of the Year Award* from USDA Rural Development, 2004 USDA Rural Development Earth Day projects for both the states of Minnesota and Wisconsin and the Minnesota Environmental Initiative Award for the years 1998, 2001 and 2003. The firm itself was the 2004 winner of the Environmental Initiative Award, Private Sector Management. The firm has designed a number of international projects; including work for the U.S. State Department.
- Water supply, treatment and distribution systems. NAWE staff has designed a variety of small community water systems, including well development, variable-speed pumping systems, transmission mains and iron & manganese removal systems.
- Contract operation of water and wastewater treatment systems. Through a subsidiary company, *Jacques Whitford EcoCheck*, NAWE provides contract operation of water and wastewater systems for residential developments, industrial and commercial facilities, school districts, resorts and small municipalities.
- Prairie and wetland restoration. NAWE provides a number of services related to habitat restoration, including assessment of native plant communities, wetland delineation, prairie seeding, contract growing and planting, burning, soil bioengineering for stream bank stabilization and wetland restoration. NAWE has restored a number of wetlands, prairies and riparian areas and has acted as a banking agent for mitigation credit transactions under the Minnesota Wetland Conservation Act (WCA).
- Environmental permitting. NAWE staff developed the first point/nonpoint-source trading permit in Minnesota for the Rahr Malting Company. The resulting trading program won the *1997*

Minnesota Environmental Initiative Award and has been the subject of numerous print, radio, internet and television media features. NAWE has extensive experience in preparation and execution of environmental assessment worksheets (EAWs), alternative urban area reviews (AUARs), environmental impact statements (EIS') and wetland delineation/mitigation reports.

- Responsible Management Entities (RMEs). NAWE has developed a variety of management services for electric cooperatives, lake associations, townships and private investment groups seeking to offer water and wastewater utility services as a responsible management entity. The firm is considered a national leader in the development of financial planning, design and operation services for RMEs.

2. **Qualifications and Experience in planning, design, construction, operation and maintenance of industrial treatment systems.**

Selected projects include:

Remediation

British Petroleum, Casper Wyoming. NAWE was responsible for the design of an integrated wetland treatment process for treating up to 3.1 MGD of BTEX-contaminated groundwater at the Former Casper Refinery site. Specific unit processes include a cascade aeration system for iron oxidation and air stripping, a soil-matrix biofilter for gas-phase benzene removal, surface flow wetland cells for removal of ferric hydroxide precipitates, stormwater retention wetlands, and radial subsurface flow insulated wetland cells for BTEX removal. *Because of the small footprint area and high BTEX removal rates required, the subsurface flow wetlands utilize a NAWE-patented technology, Forced Bed Aeration™* to maximize degradation of benzene, MTBE, and related compounds. The wetland treatment system is located in the middle of an 18-hole Robert Trent Jones golf course. Additional services provided by NAWE included pilot data interpretation, derivation of site-specific rate constants, heat budget calculations on the wetlands, nonequilibrium gas/liquid benzene phase change calculations, water quality permit assistance, and assistance with the BACT analysis for air emissions. As a direct contractor for BP, NAWE worked with the engineering firm RETEC and the construction contractor Envirocon for design and implementation of the overall project.

This project was awarded distinguished “Grand Award” from the American Council of Engineering Companies (ACEC) and winner of the “7 Wonders of Engineering Award” from Minnesota Society of Professional Engineering (MSPE).

British Petroleum, Wellsville, NY An oil refinery once operated on land currently home to The State University of New York’s Wellsville campus. As a result of the refinery’s practices, the groundwater is now contaminated with hydrocarbons, metals, and chlorinated solvents. *NAWE designed a passive wetland system as a long-term, cost effective solution to treat 280,000 gpd of contaminated groundwater.* The treatment system consists of a cascade aerator, sedimentation pond, parallel surface flow wetlands, parallel vertical flow limestone drains, and sand drying beds for iron precipitate dewatering. The design also incorporates an upgrade of the adjacent rails to trails path, restoration of the adjacent river swale, and a 20-acre site plan using entirely native plants (trees, shrubs, wildflowers, grasses and wetland plants).

Williams Pipeline, Watertown, South Dakota. NAWE provided design, permitting, construction, and planting services for a 40,000 square-foot wetland remediation system at the Watertown terminal facility. The wetland is *designed with Forced Bed Aeration™* to allow on-site remediation of a variety of waste

streams, including petroleum contact water, ethanol-contaminated stormwater, and tank bottoms. Due to the success of this facility, Williams renegotiated their permits in North and South Dakota to allow transport of waste fluids from other facilities for processing at the Watertown wetland treatment system. The constructed wetland treats wastewater to meet South Dakota discharge standards and consistently meets effluent limitations. This system is featured as a case study in the reference text *Wetlands and Remediation II*, Battelle Press, 2002.

Landfills

Anoka County Landfill, Ramsey, Minnesota. NAWE provided specialized technical expertise for the *bioremediation of up to 288,000 gallons per day of leachate-contaminated groundwater* in eight 50,000 square-foot horizontal subsurface flow wetland treatment cells. In order to provide year-round treatment, the wetlands are insulated using energy balance design methods developed by NAWE. A number of Forced Bed Aeration™ grids are employed within the wetland cells to create alternating aerobic/anaerobic zones for degradation of complex organic compounds, including tetrahydrofuran. NAWE worked with the firms RW Beck and Glenn Rehbein Excavating for implementation of the project.

Jones County Landfill, Anamosa, Iowa. NAWE was responsible for the design and construction of a pilot wetland treatment system for *remediation of up to 500 gallons per day of landfill leachate*. The pilot is operated as a research facility by the University of Iowa Department of Civil and Environmental Engineering.

Waste Management, Chicago, Illinois *Waste Management needed long-term, low-cost solution for leachate treatment at four landfills.* NAWE, in partnership with Weaver Boos, conducted four Feasibility Assessments for Waste Management's Closed Sites Management Group. The assessments compiled and documented project requirements, evaluated the range of technical options available for treatment, and recommended a treatment and disposal system that would best serve each of the landfills. The assessments also provided budgetary capital, operation, and maintenance costs for the options and addressed the risks and benefits associated with them.

County Line Landfill, Fulton County, Indiana NAWE, in partnership with Weaver Boos, designed a wetland-based leachate treatment system for the county landfill. The landfill was in need of *a solution to leachate treatment that was long-term with low operation and maintenance costs*. The system was specifically designed to pre-settle iron oxides prior to a subsurface wetland fitted with NAWE's patented Forced Bed Aeration™. Treated leachate will be disposed by irrigation.

Newton County Landfill, Newton County, Indiana NAWE in partnership with Weaver Boos Inc, designed a wetland-based leachate treatment system for the county landfill. Due to nitrogen limitation associated with land application of the effluent, *a system incorporating patented Tidal Flow Wetland technology was integrated into the design for ammonia oxidation*. The integrated wetland system consists of an aerated lagoon, free surface wetland, tidal flow wetland, and storage lagoon. The goal of the system is to provide treatment of the leachate for disposal by irrigation.

Airports

Buffalo Niagara International Airport, Buffalo, NY Buffalo Airport contracted with Jacques Whitford, NAWE, and Urban Engineers to develop a wetland-based design for treatment of spent de-icing liquid. A

subsurface wetland was selected because it can be operated year round, has low potential for bird air strikes, and can consistently meet treatment limits. A treatability study was conducted at Alfred College in Ontario to assess the rate at which an aerated, subsurface flow wetland can reduce concentrations of propylene glycol. The results of the study were used to size and locate a wetland under the conceptual design phase of the project. The results also quantify how recent advances in wetland treatment, like NAWE's patented Forced Bed Aeration™ system, can be designed to treat strong and variable wastestreams like those typical for deicing systems.

Agriculture

Rahr Malting Company, Shakopee, Minnesota. NAWE was responsible for developing numerical standards for point/nonpoint source effluent load trading and permit negotiations with the Minnesota Pollution Control Agency. The resulting NPDES permit was the first point/nonpoint source trading agreement in Minnesota and the first trading agreement in the US to feature “hard” trades. Rahr Malting won the *1997 Minnesota Environmental Initiative Award* for the permit, which has been featured on National Public Radio and in magazines such as *Runoff Report*, *Water Environment & Technology*, and *Industrial Wastewater*. Since issuance of the permit, NAWE has designed and constructed a number of innovative projects to fulfill Rahr's trading obligations under the permit, including restoration of over 140 acres of riparian area along the Minnesota River using poplar tree buffer strips and native prairie plantings, soil bioengineering to stabilize over 300 feet of severely eroding bank on Eight Mile Creek adjacent to a feedlot, installation of over one mile of high-tensile electric fencing to implement rotational grazing, and construction of a eleven J-hooks a bank terrace, and cross-sectional channel modifications along a severely eroding section of the Rush River. Rahr completed their trading obligations two years ahead of schedule and under budget.

West Central Cooperative, Ralston, Iowa To keep pace with rapid growth, West Central Cooperative (WCC), a major producer of BioDiesel, *needed a new wastewater treatment system that could handle high and variable strength wastewater.* WCC contracted with NAWE to evaluate the facility and recommend changes to improve the current system/method. NAWE worked with WCC to develop a multi-phase strategy that addressed the highly variable flows and loadings at the facility and, moreover, developed a simple and robust process train that complied with Iowa's changing regulatory environment. The core of the strategy was segregation, equalization, and pretreatment of the “contact” process wastewater. Due to the relatively low design flows and regulatory uncertainty, a facultative lagoon with controlled discharge was designed for final treatment and disposal of the WCC and Ralston wastestream.

Christensen Farms, Renville County, Minnesota Christensen Farms owns and operates a number of hog farms in the Midwest. Like many concentrated feed lots, Christensen Farms reuses water at the facility and contracted with NAWE *to create a wetland-based tertiary treatment system to improve the quality of water for reuse.* Four of the facilities were evaluated for the integration of a tertiary treatment system with the aim of reducing pollutant concentrations in the reuse stream. The final design resulted in supernatant from the anaerobic lagoon being routinely discharged to a pre-aeration cell for pretreatment. Afterwards, flow is introduced into a free-water surface wetland designed to polish the water and provide a natural habitat for water fowl. Treated water is pumped from the wetlands and reused for barn washwater.

MinAqua Fisheries, Renville, Minnesota MinAqua is a large scale Tilapia fishery located in Renville, Minnesota. MinAqua contracted with NAWE to evaluate the nutrient-laden effluent from the facility and recommend treatment scenarios for various disposal and reuse options.

Dreisbach Hilltop, Watsonville, California In partnership with Living Designs Group, NAWE evaluated anaerobic lagoon treatment options for the strawberry processing facility.

Fresh Innovations, Salinas, California In partnership with Living Designs Group, NAWE evaluated a sedimentation lagoon for treatment of wastewater generated for the onion processing facility.

Eichten Cheese, Center City, Minnesota. NAWE provided permitting, design and operation services for a wetland treatment system and subsurface disposal system for Eichten Cheese. The system treats up to 3,000 gallons per day of high-strength cheese waste. This system is featured as a case study in the reference text *Wetlands and Remediation II*, Battelle Press, 2002.

University of Vermont, Burlington, Vermont. NAWE provided planning, design, and construction observation services for the new Wetland Research Facility for the University of Vermont Dairy Farm. The system is capable of treating up to 10,000 gallons per day of milk house waste and barnyard runoff, and features an extensive instrumentation and sampling system suitable for university-grade research projects. The research facility is operated by the University of Vermont Department of Civil and Environmental Engineering.

Energy

Minnesota Municipal Power Agency, Fairbault, MN The Minnesota Municipal Power Agency's Faribault Energy Park is an on-demand, natural gas energy production facility in south central Minnesota. *To provide blending water and a raw water supply to the plant*, a wetland-lagoon complex was designed by NAWE. The power plant cooling water is too salty to discharge directly to surface water so it must first be blended with large quantities of fresh water. Stormwater is collected and treated in surface flow wetlands. Pumps circulate water between a freshwater supply pond and the wetlands to maintain high water quality. With the additional water supply the power plant can increase its operating hours. The entire wetland – pond complex is landscaped and designed for school tours and other public use.

Mining and Metal Fabrication

Rosebel Goldmine, Suriname Rosebel Gold Mines N.V. (RGM) operates an open pit gold mine with on-site ore processing facilities (the Mill) in Suriname, South America. Cyanide-containing tailings from the Mill are pumped to a large tailings pond in which solids settle out and much of the cyanides are degraded to ammonia. RGM contracted with Jacques Whitford and NAWE for the *design of a wetland-based system to produce an effluent sufficiently nitrified to avoid toxicity issues* associated with un-ionized ammonia. The treatment system consists of an aerated lagoon and a number of vertical, subsurface flow, engineered wetland cells fitted with NAWE's patented Forced Bed Aeration™.

Inland (ISPAT) Steel Mining, Virginia, Minnesota. NAWE staff were responsible for the restoration of 640 acres of wetland to create a private wetland mitigation bank. This banking site will be used by Inland to mitigate all past, present, and future wetland impacts in the State of Minnesota. Additional services have included investigation of wetland banking opportunities in the Upper Peninsula of Michigan, field delineation of wetland areas, 404/401 permitting, and Minnesota Wetland Conservation Act (WCA) permitting.

General Motors, Saginaw, Michigan. NAWE was responsible for the planning and design of a demonstration wetland pilot at the Saginaw Metal Castings plant. The horizontal subsurface flow wetland treats industrial wastewater and recycles it for use in a stream with waterfall and fish pond at the plant entrance. The project was selected by the Society of Automotive Engineers as a finalist for the *2000 Environmental Excellence in Transportation Award*. NAWE teamed with the local firm Designscales for the project.

Ohio Turnpike Commission, Cleveland, Ohio. NAWE was retained by the architectural and engineering firm URS to conduct a literature review and feasibility assessment on the use of engineered wetland systems to treat diffuse sources of blast furnace slag leachate in right-of-way areas under the responsibility of the Commission.

3. Project Team

NAWE's project team members have extensive experience in planning, permitting, design and operation of innovative waste treatment solutions. NAWE has successfully planned, designed and permitted over 150 treatment systems, including vertical and subsurface constructed wetlands, conventional activated sludge processes, trickling filters, sand filters, sequencing batch reactors and other systems ranging from single-family homes up to large-scale industrial treatment processes.

Principals

Curtis J. Sparks, P.E.

Mr. Sparks is the President of NAWE. Prior to founding NAWE, he was Vice President and Marketing Manager for HDR Engineering in their Minneapolis Office. He served 18 years in the Water Quality Division at the Minnesota Pollution Control Agency as a manager in the Permit and Program Development Sections. He was responsible for standards development, water quality monitoring, lake management, nonpoint source, toxics, permitting and many of the other emerging programs including development of the resource recovery program in the Solid Waste Division.

Mr. Sparks has a degree in Civil Engineering from the University of Minnesota. He is a licensed ISTS designer in Minnesota. Mr. Sparks served as the administrator for the Forest Lake Watershed Management Organization, Director of Lakes Area Recycling, Supervisor in Forest Lake Township and the Washington Soil and Water Conservation District. He has held many positions in both public and professional organizations. Governmental agencies, industries and environmental groups often seek his experience on water quality issues. His expertise is frequently sought by professional organizations to provide training and presentations on wastewater treatment and system management.

Scott Wallace, P.E.

Mr. Wallace is a founding partner and Vice President of NAWE. He holds a Bachelor's degree in Civil Engineering and a Master's degree in Environmental Engineering from the University of Iowa. He has served as a project manager at HDR Engineering, Shive-Hattery Engineers and Architects and at CH2M Hill.

Mr. Wallace specializes in the design of ecological systems including constructed wetlands, decentralized wastewater systems, stream bank stabilization, in-situ bioremediation and phytoremediation systems and habitat restoration. He has extensive experience in both municipal and industrial wastewater treatment. Mr. Wallace recently developed and patented several extremely efficient and cost effective wetland treatment technologies for municipal and industrial applications. He has additional experience in wastewater treatment plant operation, laboratory analysis, groundwater monitoring and wetland delineation.

Mr. Wallace has authored papers in numerous technical publications and hold patents and patents pending for wastewater treatment processes and products. He has designed over 100 wastewater treatment systems across the US and in three foreign countries, ranging in size from single-family homes to industrial systems of over 3 MGD. He is the author of "Feasibility, Design Criteria, and O&M Requirements for Small Scale Constructed Wetland Wastewater Treatment Systems" written on behalf of the Water Environment Research Foundation (WERF). As the first publication of its kind to enable wetland design with confidence intervals, the manual breaks new ground by incorporating data from over 1,800 small-scale wetland treatment systems and outlines the use, distribution, and performance of small-scale wetland treatment systems throughout the world. The report contains over 100 original figures, diagrams, and illustrations.

NAWE Engineering Group

David Austin, P.E.

Mr. Austin is Vice President of Ecological Design for NAWE. He holds a Bachelor's degree in mathematics from the University of Minnesota, a Master's degree in Water Resources Management from the University of Wisconsin – Madison and a Master's degree in Civil and Environmental Engineering at the University of California – Davis. He has served as a project manager and wastewater operations manager for Living Technologies, Inc. and as senior project manager and director of research and development at Living Designs Group, LLC. In addition to his professional engineering registrations, Mr. Austin is a Certified Ecologist - Ecological Society of America and a certified wastewater treatment operator.

Mr. Austin specializes in the design and operation of ecological wastewater and water treatment systems, including constructed wetlands and Living Machine® systems. He is familiar with wastewater designs employing recently discovered nitrogen cycle bacteria. Mr. Austin also specializes in decentralized wastewater treatment and reuse. He has additional experience in wastewater treatment plant operations, rapid prototype development, wastewater regulation and rule writing and laboratory analyses.

Mr. Austin has authored papers for technical conferences and publications. He is the principal author of five wastewater treatment patents employing advanced ecotechnology and is the author of other ecotechnology patents pending. Mr. Austin has designed or commissioned industrial and private municipal wastewater treatment systems across the United States and in three foreign countries.

Mr. Austin is a former United States Navy Reserve officer with experience in marine salvage and diving. He speaks Portuguese and Spanish.

Richard Wagner

Mr. Wagner is the Senior Vice President of Field and Technical Services for North American Wetland Engineering. He has a BS in Industrial Arts at Millersville University, Millersville, PA. Mr. Wagner has over 25 years of experience in the engineering and construction fields. His construction experience ranges from water and wastewater treatment plants to electric generating plants. He has provided construction management for over 50 NAWE designed systems with sizes ranging from 500 gallons per day to 3 million gallons per day. He has extensive CAD experience with over 150 projects at NAWE. Mr. Wagner is a Class C licensed wastewater treatment plant operator and a licensed ISTS designer in Minnesota.

His experience has also included engineering site inspector for a 15 million-dollar wastewater treatment plant expansion at the City of Monticello, Minnesota. Other projects included design/drafting for a 10 MGD water treatment plant expansion for the City of Brooklyn Park, Minnesota, numerous Red River Valley flood control projects and other storm water projects.

Mr. Wagner's experience also includes project management, design and installation supervision of a 3 million-dollar water chemistry sampling system at the Monticello Nuclear Generating Plant. While at the Generating Plant he also managed the CAD design/drafting group involved in many plant modifications. At NAWE, he has been involved in all of the designs produced since 1997.

Marc A. Henkel

Mr. Henkel is the lead CAD designer for North American Wetland Engineering. Mr. Henkel has over 15 years of experience in the engineering field. He has design/drafting experience in water, wastewater, Biosolids drying, electrical generation and wind power. His experience in water facilities was for the cities of Brooklyn Park and Albert Lea. His wastewater experience comes from the design of facilities in the cities of Monticello and Empire Township, just to name a few.

In Biosolids drying he has developed facilities for the Metropolitan Council on Environmental Services (MCES) in Shakopee and Solid Waste Authority (SWA) in Palm Beach, Florida. His electrical generating experience comes from design/drafting while working at the Monticello Nuclear Generating Plant as well as projects for the cities of Rochester, Winona and Ottertail County. His wind farm experience comes from projects in Minnesota and Iowa.

Bryan C. DeSmet, P.E.

Mr. DeSmet holds Bachelor of Science degrees in Chemistry, Biology and Civil Engineering, as well as a Master's degree in Civil Engineering from South Dakota State University. While at SDSU, Mr. DeSmet studied the removal of radium from drinking water utilizing manganese greensand filters.

Mr. DeSmet's experience includes wastewater treatment system design and operation, water treatment system design and project management responsibilities for several design/build projects. Over the last 15-years, Mr. DeSmet's work experience has included the preparation of numerous system evaluations, design improvements and bid documents for both water and wastewater systems in the United States. In addition, Mr. DeSmet has over 5-years of experience as a project manager on international design/build projects including both water and wastewater system design and construction, as well as projects as varied as light rail transit, hydropower and solid waste disposal and composting. Mr. DeSmet began his career as a wastewater treatment system process engineer and plant manager for the City of Omaha, Nebraska. Since that time his work has involved providing professional consulting services to municipal and industrial clients. At NAWA, Mr. DeSmet is responsible for water system and wastewater system design and project management.

Mark O. Liner, P.E.

Mr. Liner holds a Bachelor of Science degree in Civil Engineering from Lehigh University and a Masters of Engineering degree in Environmental Engineering from Clemson University. His Master's work investigated modeling software for the design of sewage plants, which was presented at the 70th Annual Water Environment Federation Technical Conference (WEFTEC '97).

Mr. Liner's experience has been concentrated in the wastewater treatment but in a variety of capacities. Initially, he worked for EPA in Washington, DC developing effluent guidelines for industrial pretreatment. Since then, he has worked as a consultant design engineer in the financing of facility modifications, retrofitting facilities to meet stringent nutrient removal requirements and developing NPDES permit strategies. He has also been a design expert for a lagoon process supplier and managed an engineer-procure-construct contract for a large wastewater treatment facility. Mr. Liner has additional experience in the design, construction and operation of water distribution systems as a Peace Corps volunteer in Nepal.

Brian Davis, G.I.T, Ph.D.

Brian Davis is a Senior Design Engineer, joining NAWE in September 2005. Brian received his B.S. in Geography (major) and Geology (minor) from the University of Wisconsin-Whitewater in 1994 and his M.S. in Environmental Science & Policy from the University of Wisconsin-Green Bay in 1997. His Master's research focused on an assessment of the treatment effectiveness of mound systems in northeast Wisconsin, focusing on coliform attenuation and nitrification/denitrification characteristics, work which was ultimately submitted as a final report to the Wisconsin Dept. of Commerce.

Following completion of his M.S., Brian joined Environmental Compliance Consultants, Inc., a Green Bay, Wis.-based consulting firm, conducting leaking underground storage tank investigations and remediation activities. In 1998, Brian entered the Ph.D. program in Environmental Engineering at Oregon State University, where he conducted federally-funded research regarding the use of naturally occurring dissolved radon gas in groundwater as a partitioning tracer for quantifying chlorinated solvent and petroleum hydrocarbon saturations in the subsurface. The research was conducted at military bases and former refineries/industrial facilities across the U.S. and formed the basis for three peer-reviewed publications in scientific/engineering journals. He also participated in research regarding the bioremediation of chlorinated solvents and radionuclides. Brian received his Ph.D. in 2003, and then joined Chevron Corporation in the San Francisco area as a hydrogeologist, providing technical consulting services for groundwater contamination, groundwater and hazardous waste remediation and water quality issues associated with Chevron operations in North America, Africa and Asia.

A certified geologist-in-training, Brian has expertise in numerical modeling of water chemistry, analytical and numerical modeling of unsaturated and saturated subsurface flow processes, as well as significant analytical chemistry experience.

Carla Cross, PE

Ms. Cross joined the engineering team at NAWE in June of 2001. She received her Bachelor of Science in Civil Engineering and a Master of Science in Civil/Environmental Engineering from the University of Iowa. Her training is in groundwater, environmental chemistry, engineered systems, biological treatment processes, hazardous waste treatment and environmental engineering design. Her master's thesis was on the treatment capabilities of subsurface flow constructed wetlands utilizing Forced Bed Aeration™ to treat landfill leachate. This research was a cooperative venture between NAWE, the Jones County Iowa landfill commission and the University of Iowa. She also has a Bachelor of Arts degree in Political Science and English from Iowa State University.

Ms. Cross is responsible for the planning and design of wastewater treatment systems. She is also involved in construction observation and site investigations. Previously, she was employed at the Cedar Rapids Water Department as an Engineering Intern, a CAD draftsman for William Peterson Architects and as a staff reporter for the Iowa State Daily.

Tara McDonough, EI

Ms. McDonough has a Bachelors of Science in Civil Engineering with a concentration in Environmental Engineering from The Pennsylvania State University. During her time at Penn State she interned at HRG Environmental Engineering, where she analyzed and maintained a nano-filtration water treatment pilot system and designed components for a wastewater reuse project. Her senior thesis involved an ecological and economic audit of Penn State's Civil and Environmental Engineering Building, which included cost-effective retrofit recommendations.

Since graduating in 2002 she has conducted a site-specific feasibility study on organic aquaculture for the Camphill Kimberton farm community in southeastern Pennsylvania. In addition, Ms. McDonough has completed a year of volunteer work at Young People Who Care, a social service organization in rural Pennsylvania. Coincidentally, three years prior to this service, she had collected data and compiled total daily maximum load reports on acid mine drainage affected streams for the Pennsylvania Department of Environmental Protection in this same area.

Jaime Nivala, E.I.

Ms. Nivala has worked as a student intern for NAWE since 2002, then became a full-time employee in February of 2006. She has assisted NAWE technical staff on numerous projects and reports, including system analyses, environmental impact statements and alternative urban areawide reviews. She did extensive work for the Feasibility, Design Criteria and O&M Requirements for Small Scale Constructed Wetland Wastewater Treatment Systems project on behalf of the Water Environment Research Foundation (WERF), which entailed creating a database of small-scale wetland systems across the globe and creating a literature database of over 1,700 wetland-related references. Ms. Nivala serves as the technical editor for many NAWE publications and assists in preparing material for submission to scientific journals.

Ms. Nivala earned a B.S. in Civil Engineering with an emphasis in Environmental Engineering from the University of Minnesota in December 2002 and a M.S. in Environmental Engineering from the University of Iowa in August 2005. Her M.S. research focused on the use of an aerated subsurface flow constructed wetland for treatment of landfill leachate.

Shane Sparks, G.I.T.

Mr. Sparks is a geologist performing soils and hydro geological investigations, wellhead siting and protection, construction observation, wastewater operations and field services for NAWE. He has a double major in Geology and Geophysics from the University of Minnesota in 2002. He worked for American Engineering Testing performing soils engineering and testing as an engineering technician from September 2001-August 2003.

NAWE conducts geophysical investigations of all wastewater dispersal systems to insure that the long term viability of the wastewater system is assured. Monitoring well location, installation and documentation is required for MPCA permitted projects. Phosphorus and Nitrogen dispersion modeling is required for most projects. Mr. Sparks performs these studies.

In the NAWE water program, Mr. Sparks is responsible for drinking water well siting, protection and wellhead protection plans. He is proficient on well sampling and report preparation.

Mr. Sparks has considerable computer capability in GIS and ArcView. He is currently certified as a Professional Geologist in training and also a certified soil tester in the state of Minnesota.

Michael Cochran

Mr. Cochran received his Bachelor's of Science in Ecology, Evolution and Behavior from the University of Minnesota. While attending school, he worked extensively with soils, both agricultural in Dr. Carl Rosen's extension lab and industrial while working at American Engineering Testing. His previous job was working for the Nature Conservancy performing a biodiversity study in the upland forests of the North Shore of Lake Superior. Here he gained a good proficiency with ArcView GIS, adding to his strong familiarity with technical field software.

Mr. Cochran has field experience in university labs across the United States including Agricultural Soils and Water, Stream Ecology and Evolutionary labs. At NAWE, he brings these skills together as a Field Services Technician and will be responsible for a variety of field services including wetland delineations, soil testing and site evaluations. He has recently been certified as an ISTS soils inspector as well as completing the HAZWOPER 40 hour certification.

Construction Observation Group

Matthew Wildman, P.E.

Mr. Wildman is the Construction Manager NAWE and Senior Engineering. He received a Masters degree in Civil/Environmental Engineering from the University of Iowa in 1998. While at the University of Iowa, Mr. Wildman studied the effects of genetically engineered microorganisms in the root zone of poplar trees for contaminant removal. For his master's thesis, he examined the ability of zero-valent iron barriers to transform contaminants to more biodegradable and less toxic forms.

Mr. Wildman is part of NAWE's design team and has been the lead designer on NAWE's work for the Boy Scouts of America, the Rum River Elementary School in Andover, McKinley Elementary School, City of Wright, City of Delft, the and the Mille Lacs Band of Ojibwe. He also spends extensive time in the field as a construction supervisor, managing projects like McKinley Elementary, Lake Allie and the Village of St. George. Mr. Wildman was the onsite construction supervisor for USDA Rural Development projects at the City of Darfur and the Upper Sioux Community. He also plays an important role at NAWE conducting site investigations, writing Preliminary Engineering Reports and assembling bid packages.

Jeff Row, EI

Mr. Row received a Bachelors of Science in Civil Engineering with an emphasis in Environmental Engineering from the University of Minnesota in December 2002. He joined the construction observation team at NAWE in March of 2005. Mr. Row is responsible for construction quality assurance on NAWE projects. He is the Resident Project Representative for the construction of a new wastewater collection, treatment and disposal system for the City of Prinsburg. The city of Prinsburg project was funded by USDA Rural Development and was designated the Earth Day project for 2004.

Prior to joining the NAWE team, Mr. Row worked with Howard R. Green Company as a Staff Engineer with the municipal department. His work included construction inspection and street and utility design. Mr. Row is Mn/DOT certified for erosion and sediment control, aggregate production, grading and base level I, concrete field level I and bituminous street level II.

EcoCheck Operations Group

Ryan C. Brandt

Mr. Brandt has over 8 years of wastewater experience, focusing on project management, soils investigations, wastewater operations and design, GPS mapping and construction management. Mr. Brandt is an alumnus of the University of Wisconsin – River Falls where he graduated in 1995 with Senior Academic Honors majoring in Biology and Chemistry. Prior to joining NAWE in 1997, he was employed as a biologist and project manager for HDR Engineering.

Mr. Brandt is a Class C licensed wastewater treatment plant operator and serves as NAWE's lead operator of wastewater systems. His responsibilities associated with operations include routine water quality monitoring and maintenance, troubleshooting, coordination with analytical laboratories and monthly

reporting to state regulatory agencies such as the Minnesota Pollution Control Agency. Mr. Brandt also serves as project manager for NAWE's wastewater operation projects. These projects include NAWE designed wastewater systems serving the Forest Lake School District, Anoka Hennepin School District, City of Palisade, Lake Allie Environmental Subordinate Service District, Eagle View Commons, Jackson Meadows, Fields of St. Croix, Super-America stores, Savanna Meadows, Eichten Cheese Plant and other wastewater facilities. Mr. Brandt has previously served as an operator at the City of Austin, MN Wastewater Treatment Facility. During this time, he was involved in sludge dewatering and solids management, pilot plant testing, water quality monitoring and selection of sludge land application sites.

Mr. Brandt is also responsible for wetland delineations, permitting and planning for residential developments, design of wetland replacement projects and mitigation banking sites and restoration designs of native prairie and wetlands. He also holds certification in the State of Wisconsin as a Certified Soil Tester (CST) for wastewater projects. Mr. Brandt owns and operates Prairie Bay Farms, a native prairie and wetland plant nursery that specializes in growing native plant stock for NAWE projects.

Mike Thompson

Mr. Thompson provides wastewater operations, grant administration, financial planning and city administration services for NAWE. Prior to joining NAWE, he was employed as a grant writer/administrator with Lakes and Pines Community Action Council in Mora, Minnesota. He successfully wrote grants for NAWE wastewater projects in the Cities of Palisade and Tamarack, Minnesota. He previously served as a City Administrator for the Cities of Braham and Rush City, Minnesota. For thirteen years, he was also a heavy equipment operator/pit foreman for the M.A. Hanna Mining Company on Minnesota's Iron Range.

Steve Kokesh

Mr. Kokesh provides routine operational maintenance and monitoring of wastewater and water systems. Steve also assists in soils investigations, mapping sites, wetland delineations, wetland and prairie restoration and surveying. Steve has a Bachelor of Science degree in conservation with a minor in hydrogeology from the University of Wisconsin-River Falls. Steve has seven years of wastewater treatment operations experience and was previously employed by US Filter Recovery Services as the wastewater ion exchange supervisor.

Neile J. Reider, EIT, LEED AP

Mr. Reider joined the NAWE/EcoCheck team in December of 2004. Mr. Reider is a LEED Accredited Professional, a Class C wastewater operator, a Class D water operator, and a certified Engineer in Training. Mr. Reider is responsible for the management, operations, maintenance, and monitoring of wastewater and water systems. He also assists in soils investigations, mapping sites, wetland delineations, wetland and prairie restoration and the planning and design of wastewater treatment systems. Prior to NAWE/EcoCheck, he worked at the Army High Performance Computing Research Center (AHPARC) to validate a computational fluid dynamics dispersion model for urban environments. He also worked as a property manager for a small company and as a community advisor in the university dormitories.

Mr. Reider received his Bachelor of Biosystems and Agricultural Engineering with an emphasis on Environmental engineering from the University of Minnesota. Currently, Mr. Reider is attending the University of Minnesota to obtain his Masters of Science in Infrastructure Systems Engineering.

Mr. Reider was president of the University of Minnesota's student chapter of the American Society of Agricultural Engineering and of Alpha Epsilon, an engineering honor society. He has also volunteered his time to non-profit organizations: 15+ years for Last Chance Forever, a bird of prey conservancy and one

year for Let's Get Ready, a SAT and college preparation course for underserved high school students in their communities.

Business Management Team

Judy Lissick

Ms. Lissick is the Director of Operations for NAWE. She has over 20 years experience in the financial services industry. She is a seasoned executive with broad experience as a general manager and in customer service, operations, strategic planning, marketing and sales.

Ms. Lissick earned a condensed Masters degree from Tuck of Dartmouth in 1998. She earned her Bachelor of Science degree in Business Administration with a minor in Marketing from Winona State University in Minnesota.

Ms. Lissick has a passion for youth and the environment. In addition to spending time with her two sons and her husband, she has served on the executive committee of the Board for the Boys and Girls Clubs of the Twin Cities for the past 10 years. She is currently the Board President.

Karen Asencio

Ms. Asencio is the Office Manager for NAWE. She is responsible for answering phones, project filing, invoicing, accounts payable and accounts receivable. She is a 20-year veteran of the U.S. Air Force.

Patty Flanagan

Ms. Flanagan is the Administrative Assistant for NAWE. She is the office support for the entire team. She is in charge of answering the phones, ordering supplies, making copies, mailing items and other general support to help maintain a well run office. She has worked in an office environment for over 8 years and has over 13 years of customer service experience.

Ms. Flanagan is an advocate of children and volunteers in the local school. She also has held the position as PTA Secretary for 4 years.