

Nicholas Routhier Valcourt, Ph.D.

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EDUCATION

University of Colorado – Boulder, CO

College of Engineering & Applied Science

Mortenson Center in Engineering for Developing Communities

PhD Civil Systems Engineering - 2019

Mortenson Center Fellowship; Sep 2016 – May 2017

USAID Sustainable WASH Systems Learning Partnership, Research Assistant; March 2017 – August 2019

Thesis: [Understanding the Complexities of Water, Sanitation & Hygiene Systems through Local Stakeholder Perspectives](#)

M.S. Civil Systems Engineering / Civil Engineering - 2016

Mortenson Center Graduate Fellowship, Spring 2015

Representative to MCEDC Executive Committee Aug 2015 – May 2017

Principal Organizer of Colorado WASH Symposium; Oct 2014 – March 2019

Organizer of EDC Student Advisory Committee; Sep 2014 – Aug 2016

National Science Foundation Graduate Research Fellowship (NSF GRFP) Honorable Mention - 2015

Coursework: Systems Thinking, Qualitative & Quantitative Research methods, Sustainable Community Development, Global Engineering, WASH, Development Fieldwork Methods, Quantitative Policy Analysis, Sustainable Livelihoods

The George Washington University – Washington, DC

School of Engineering & Applied Science

BS Civil and Environmental Engineering - 2007

Recipient of Undergraduate Research Grant & Senior Design Award

PUBLICATIONS

Valcourt, N., Javernick-Will, A., Walters, J., & Linden, K. (2020). [System Approaches to Water, Sanitation, and Hygiene: A Systematic Literature Review](#). *International Journal Of Environmental Research And Public Health*, 17(3), 702.

Valcourt, N., Walters, J., Javernick-Will, A., Linden, K., & Hailegiorgis, B. (2020). [Understanding Rural Water Services as a Complex System: An Assessment of Key Factors as Potential Leverage Points for Improved Service Sustainability](#). *Sustainability*, 12(3), 1243.

Valcourt, N., Walters, J., Javernick-Will, A., & Hollander, D. (2019). [Summary Report of Baseline IFML Analyses In Kamuli District, Uganda](#). Sustainable WASH Systems Learning Partnership: United States Agency for International Development (USAID)

Valcourt, N., Walters, J., Javernick-Will, A., & Hollander, D. (2019). [Factor Mapping for Rural Water and Small Town Sanitation Services](#). Sustainable WASH Systems Learning Partnership, United States Agency for International Development (USAID)

Valcourt, N., Walters, J. P., Javernick-Will, A., & Linden, K. (2019). [Understanding complexity in WASH systems](#). Proceedings of All Systems Go WASH Systems Symposium. All Systems Go WASH Systems Symposium, The Hague, The Netherlands

Valcourt, N. "[The need for Systems Thinking in WASH: NOW](#)" (2018), Medium

Forthcoming

Valcourt, N., Javernick-Will, A., Walters, J., & Linden, K. (2020). Assessing the efficacy of group model building workshops in an applied setting through purposive text analysis. *System Dynamics Review*

Walters, J., Javernick-Will, A., Valcourt, N. (2020). Sector Perspectives on the Attributes of a WASH Systems Approach and the Importance of System Interactions. *Journal of Water, Sanitation and Hygiene for Development*

EXPERIENCE

Open Water Systems

May 2020 - Present

Building on work conducted under the USAID Sustainable WASH Systems Learning partnership, I provide organizations with complex systems insights drawn from a variety of data types, contexts and applications. Work includes facilitating 'Factor Mapping' workshops, a group model building activity which engages a wide range of stakeholders in systems-thinking principles. Outputs from these workshops are used to develop complex systems diagrams (i.e. causal loop diagrams) which provide unique and robust insights drawn directly from participants' perspectives of the complexity of local systems. I also provide a broad range of systems-strengthening analyses drawing on primary or secondary qualitative and quantitative data to identify key leverage points within a complex system where organizations, government and civil service can strengthen connection to produce desired outcomes. This work is part of a growing trend of 'systems thinking' approaches within the international development sector.

nicholasvalcourt.org

Sustainable WASH Systems Learning Partnership

Boulder, CO, Ethiopia, Uganda, Cambodia

Research Assistant

Mar 2017 – Aug 2019

Worked as part of a large and diverse international team of practitioners, program managers and sector thought leaders to conceive, coordinate, support and conduct wide-ranging systems-thinking research activities on water, sanitation and hygiene systems. Tasks included conceptualizing research and learning agendas; formalizing research protocols; securing institutional review board ethical approvals; developing mechanisms for the collection of qualitative and quantitative data related to WASH systems, and; analyzing, reporting and disseminating key findings to diverse audiences. In this role I helped to advance the deployment of 'Community Based System Dynamics' activities in low-resource contexts; and developed some of the first complex systems analyses for the USAID Water Office.

globalwaters.org/SWS

Dar Si Hmad for Development, Education and Culture

Agadir & Sidi Ifni, Morocco

Water and Sanitation Project Engineer

May 2015 – July 2015

Served as an auxiliary staff member, providing engineering and administrative support to small development organization focused on improving livelihoods of rural Berber communities in Southwest Morocco. Work includes preparing reports and grant applications for USAID, Moroccan embassies and other funding partners (+\$1M total) for water and sanitation infrastructure, most notably the world's largest and most advanced fog-water harvesting and distribution system. Also conducted interviews to study the effect of on-site piped water sources on local women's livelihoods and surveyed existing infrastructure in preparation of recommendations for improved sanitation & grey water systems.

darsihmad.org

Add Water International

Portland, OR & Gros Morne, Haiti

Support Project Engineer

July 2013 – Nov 2013

Serves as a volunteer Project Engineer for a 502(c)(3) organization focused on developing community water projects in various locations in the Republic of Haiti. Duties include designing, planning and building water systems for underserved populations, training local personnel to operate water systems and meeting with stakeholders to better understand water needs and conditions. First installation completed in November 2013 in Tricotte, Haiti for remote medical clinic. Additional work includes mapping and testing public water points and investigating new water technologies for local, low-cost water filtration (ceramic filters) and disinfection (salt chlorine generators) addwater.org

Creating Ties (Creando Lazos)

Lima + Cuzco, Peru

Water Projects Consultant

June 2012 – Nov 2012

Consultant to a service travel organization working with native and urban squatter communities to develop sustainable solutions for providing access to clean water in Peru. Following travel to Peruvian communities, fundraising and feasibility design in 2012 implementation and construction were completed in 2013. creatingties.com

Waste Water Management, Inc.

Falls Church, VA

Consultant

April – June 2013

Project Engineer + Project Manager

June 2007 – January 2011

Responsible for conceptual, process and mechanical engineering design of water & wastewater systems. Performed process reviews of treatment facilities, conducting site visits, data analysis and preparing optimization reports. Developed detailed, construction-grade drawings and specifications for >\$1M(USD) projects. Responsible for client development, marketing and proposal writing. Managed firm's research & development program of innovative wastewater technologies. Consulted on R&D testing involving greywater and mining wastewater for international partners.

TLH Structural Consulting, LLC

Billerica, MA

Project Engineer

Aug 2011 - Oct 2011

Performed wood, steel and concrete structural engineering design for residential, commercial and industrial buildings. Drafted construction-grade drawings for contractors and regulatory approval. Performed on-site inspections of existing buildings and provided structural evaluations

DC Water and Sewer Authority (DC Water)

Washington, DC

Lab Assistant + Researcher

June 2006 – June 2007

Provided environmental research support for team focused on nutrient removal performance. Conducted lab research on nitrification and de-nitrification kinetics with supplemental carbon addition. Received a university grant to conduct independent research with nitrification substrate microseeds. Developed a proficient knowledge of common water/wastewater treatment quality tests including BOD, COD, solids, turbidity, nutrient/toxin assessment and alkalinity.

ENGINEERING PROJECT EXPERIENCE

Wastewater Treatment Plants

Afghan National Police, NTC WWTP - Wardak, Afghanistan
Widewater WWTP – Widewater, VA
Webster Field Annex WWTP - Inigoes, MD
Warrenton Chase WWTP and WSF – Warrenton, VA
Chapel Point Wood WWTP – Bel Alton, MD
Montross-Westmoreland WWTP – Montross, VA
Evergreen Country Club WWTP – Haymarket, VA
Gesher Jewish Day School WWTP – Fairfax, VA

Sewage Pumping Stations

Gunston Commerce Center Sewage PS – Lorton, VA
Kettle Run High School Sewage PS – Nokesville, VA
Pro Logis Pumping System – Manassas, VA
Widewater Pump Stations – Widewater, VA
Wilderness Pumping System – Wilderness, VA
Kelly Leadership Center Pump Station – Manassas, VA

Waterworks Systems Design

Lovettsville Water System – Lovettsville, VA
Monroe Heights Community Waterworks – Stanardsville, VA

Stormwater Pumping Stations

Army Corps of Engineers Stormwater Pumping Stations – Prince George's County, MD
World War II Memorial Stormwater System - Washington, DC

Strategic Water and Sewer Planning

Pocahontas County Public Service District– Snowshoe, WV
Chincoteague Sewer Plan – Chincoteague, VA
Stonewall Water Reuse Study– Leesburg, VA
Town of Purcellville Sewer Master Plan – Purcellville, WV
St Mary's County Public Schools WWTPs– Helen, MD
Lovettsville Water System – Lovettsville, VA
Ladysmith Water Company Operations Plan – Lake Caroline, VA
Spotsylvania School 18 Water Reuse – Spotsylvania, VA

Research & Development

Electrocoagulation Research
Mooney WWTP - Prince William County, VA
Arlington WWTP – Arlington, VA
Coca Cola BBP – Atlanta, GA
Oil Drilling Rigs – Edmonton, Alberta, CA
Blue Plains WWTP Denitrification Kinetics– Wash, DC

Forensic Investigation

Gunston Commerce Sewage Pumping System – Fairfax, VA
Cattail Creek Water Pumping System - Glenwood, MD

Expert Witness

Krispy Kreme Doughnut Manufacturing - Fairfax, VA

SELECT ENGINEERING PROJECT NARRATIVES

TOWN OF CHINCOTEAGUE, VA – Public Sewer Feasibility Study (2007)

Served as Project Coordinator responsible for developing a comprehensive report for the first centralized wastewater system on the Island of Chincoteague – a rural tourist destination on the eastern shore of Virginia. Organized environmental data from various local, regional and national agencies assessing the existing environmental impact of failing septic systems. Developed preliminary engineering plans and cost estimates for a collection, treatment and disposal system on the island. Met with the EPA officials to discuss environmental conditions of the island and possible disposal options, including deep well injection. Presented findings to the Governor's cabinet, state agencies, Town Mayor & Council and residents through a series of public seminars.

POCAHONTAS COUNTY PUBLIC SERVICE DISTRICT, Snowshoe, WV - Operations Assessment (2011)

Assessed the management operations of this wastewater utility in West Virginia. Project included multiple site visits, interviews with operators and managers along with a thorough review of process data and operations records for three wastewater treatment plants. Provided comprehensive assessment of the existing conditions. This included recommendations for improved operations of the wastewater treatment processes and business operations. Project success necessitated an understanding of the unique requirements and constraints of operating a utility in a rural area with demanding weather conditions.

ARCHITECTURAL DESIGN

spacebarn

Owner + Designer

May 2011- Present

Spacebarn is a design | build | construct business that provides residential, interior and custom furniture design as well as renovation and installation services. Founded as a re-used and recycled furniture and wall art shop, Spacebarn has expanded to include detailed building design services for custom interiors and high-end residential renovations space-barn.com

RUCKERHILL

Designer + Project Manager

Fort Collins, CO

Aug 2017 – May 2020

RuckerHill Design Build is a design-build designer and general contractor of residential, commercial and public spaces. In the role as designer, I have managed the drafting and plan production phases of high-end custom homes. Beginning in July 2019 I also began to work in a project management capacity, including estimating construction costs, coordinating sub-contractors and overseeing day to day construction activities. As RuckerHill continues to expand we will move into ever larger and more public-facing spaces including large industrial manufacturing and municipal buildings. ruckerhill.com

Grossmuellers Design Consultants / ART Design Build

Designer

Washington, DC

Sep 2013 – June 2014

Part of a fast-paced, award-winning residential design-build firm specializing in high-end renovation of older properties. Provided drafting, concept layout and structural design services, producing a majority of the company's plans, models and renderings. Drafting work ranged from as-built surveys to artistic presentation graphics and highly-detailed permit drawings and survey plats. Participated in business development, client services, trade coordination and construction administration.

VISUAL ARTS

- 2016 **Meet the Ocean** – Interactive, multimedia art and education awareness program focused on ocean conservation. meettheocean.org
- 2015 **(un)developed** – Series of four mixed media posters exploring themes around international development theory. Tryptic Gallery, Norlin Library, University of Colorado - Boulder
- 2013 **INTERUPTUS** – Interactive month-long multimedia installation discussing issues of ocean sustainability through art. Homeland Gallery, Portland, OR

CONSTRUCTION + WOODWORKING EXPERIENCE

Over 15 years' experience with a wide range of construction and woodworking trades working independently and supporting general contractors. General experience in interior and exterior residential renovations and new construction ranging from demolition and framing to finish carpentry and painting. A skilled, safe and thorough worker accustomed to producing a professional finished product that meets and exceeds client expectations.

Tradesman Renovation

Portland, OR

May 2012 – Aug 2013

Contractor's assistant and general laborer; worked on interior and exterior residential renovation and new construction projects including framing, siding, flooring, tile, painting, egress well and drain installation, dry rot repair, waterproofing and demolition.

WestWinds Remodeling

Portland, OR

Nov 2011 – Feb 2012

Contractor's assistant and general laborer; assisted with interior and exterior residential renovations including windows, siding, drywall, painting, electrical, plumbing and tile work.

NW Concrete Interiors

Portland, OR

Oct 2011- Jan 2012

Assistant for a concrete countertop design, manufacture and installation shop. Built casting forms and prepared concrete mixes for custom countertops. Work included finishing, polishing, transportation and installation of heavy and fragile countertop pieces.

Jeffrey Kennan Woodworking

Hopedale, MA

April – June 2011

Carpenter's assistant in a custom furniture and woodworking shop. Assisted with cabinetry construction including panel cutting, assembly, sanding and finishing. Also performed interior and exterior residential renovation work and light automotive body work.

Handyman Services of Maryland

Bethesda, MD

Sep 2005 – June 2007

Independent contract carpenter and handyman performing a wide range of interior and exterior home renovation and construction projects. Responsible for all aspects of project work including estimating, materials acquisition, repairs and construction.

Habitat for Humanity

Concord, MA

Fall 2005

Volunteer for construction of residential projects with chapter of Greater Lowell, Massachusetts.