

**Nazmun Nahar, PhD., P.Eng.**

**Water Resources Specialist**

**Director**, Institutional Quality Assurance Cell (IQAC), North South University

**Professor**, Department of Civil and Environmental Engineering,  
North South University, Bashundhara, Dhaka, Bangladesh

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**AREAS OF EXPERTISE**

- Analysis of hydrologic and hydraulic data using dynamic and complex hydrologic and hydraulic modeling software
- Integrated Stormwater Management Planning
- Flood Mitigation and Floodplain Management
- Assessment and Design of drainage infrastructure
- Assessment and Design of Best Management Practices (BMP) and Low Impact Development (LID) measures
- Water, Sanitation and Hygiene (WASH) Strategies and Regulations
- Quality Assurance in Higher Education

**EDUCATION**

Ph.D., Civil Engineering (Hydraulics and Hydrology), Purdue University, 2003

Research Topic: “Influence of Run-on on Field-scale Surface and Subsurface Water and Contaminant Movement over Spatially Variable Hillslopes”

Major Professor: Dr. R.S. Govindaraju

MS, Civil Engineering (Hydraulics and Hydrology), Purdue University, 1998

Research Topic: “Influence of First Order Degradation on Spatial Moments of the Convection-Dispersion Equation with Kinetic Sorption”

Major Professor: Dr. R.S. Govindaraju

B.Sc., Civil Engineering, Bangladesh University of Engineering and Technology (BUET), 1995

**EMPLOYMENT BACKGROUND**

FROM: January 2016 – To date

EMPLOYER: North South University, Dhaka, Bangladesh

POSITION: Director, Institutional Quality Assurance Cell (IQAC)

FROM: September 2018 – To date

EMPLOYER: Department of Civil and Environmental Engineering, North South University, Dhaka, Bangladesh

POSITION: Professor

FROM: September 2013 – August 2016

EMPLOYER: Department of Civil and Environmental Engineering, North South University, Dhaka, Bangladesh

POSITION: Associate Professor

FROM: November 2012 – August 2013

EMPLOYER: Department of Civil Engineering, University of Asia Pacific, Dhaka, Bangladesh  
POSITION: Assistant Professor

FROM: August 2011 – May 2012

EMPLOYER: British Columbia Institute of Technology (BCIT) , Burnaby, BC, Canada  
POSITION: Assistant Professor

FROM: August 2008 – April 2011

EMPLOYER: Urban Systems Ltd., Richmond, BC, Canada  
POSITION: Water Resources Engineer

FROM: October 2005 – July 2008

EMPLOYER: Associated Engineering Ltd., Burnaby, BC, Canada  
POSITION: Water Resources Engineer

FROM: September 2003-September 2005

Worked as Independent Researcher and published 3 papers during this period.

FROM: January 1997 – August 2003

EMPLOYER: Purdue University, Indiana, USA  
POSITION: Research/Teaching Assistant

## **TEACHING RESPONSIBILITIES**

09/2013 to to-date: Associate Professor, Civil and Environmental Engineering, North South University.

Courses taught:

- CEE 110: Computer Aided Drawing
- CEE 100: Introduction to Civil and Environmental Engineering
- CEE 211: Fluid Mechanics
- CEE 211L: Fluid Mechanics Laboratory
- CEE 260: Hydrology
- CEE 360: Open Channel Flow
- CEE 360L: Design lab for Open Channel flow
- CEE 460: Groundwater Hydraulics
- CEE 467: Irrigation and Drainage Engineering
- CEE 499: Supervising 4<sup>th</sup> year student project/thesis

## **JOURNAL/BOOK CHAPTER/CONFERENCE PAPERS**

- “Assessment of Existing Teaching Evaluation Process in a Higher Education Institute of Bangladesh”, **Hossain, S.** , Nahar, N., and Tazmeen, A. Accepted for the Conference on “ In Pursuit of Quality in Higher Education: Challenges Ahead’ to be held at the University of Liberal Arts, Dhaka, Bangladesh on August 22-23, 2019.
- “Establishment of an Effective Institutional Quality Assurance Cell in a Higher Education Institution of Bangladesh: Case Study North South University” , **Nahar, N.**, Hossain, S.

- and Tazmeen, A. International Conference on Quality Assurance in Higher Education 2018 (ICQAHE 2018), February, 2018.
- “Community Based Rainwater Harvesting in Dhaka City”, Khan, S. A., Hossain, M. A., Mahjabeen, S., Raisa, F. E., and **Nahar, N**, International conference on Climate Change in relation to Water and Environment [I3CWE-2015], April 2015.
  - “A Numerical Evaluation of the Role of Run-on on Sediment Transport over Heterogenous Hillslopes,” **N. Nahar**, R.S. Govindaraju, C. Corradini and R. Morbidelli. Journal of Hydrologic Engineering, Vol. 13(4), pp 215-225., 2008.
  - “Infiltration and Run-on under Spatially Variable Hydrologic Properties,” Govindaraju, R.S., **N. Nahar**, ,C. Corradini, and R. Morbidelli, in Handbook of Groundwater Engineering, ed. J.W. Delleur, 2005.
  - “Role of Run-on for Describing Field-Scale Infiltration and Overland Flow Over Spatially Variable Soils,” **N. Nahar**, R.S. Govindaraju, C. Corradini and R. Morbidelli. Journal of Hydrology, Vol 286/1-4 pp 36-51, 2003.
  - “Run-on and Sediment Transport over Heterogeneous Hillslopes,” **N. Nahar**, R.S. Govindaraju, C. Corradini and R. Morbidelli. 32nd IAHR Congress, Venice, Italy, 1-6 July 2007.
  - “Quantifying the Influence of Spatial Variability on the Run-On Process: A Numerical Study,” **N.Nahar** and R.S.Govindaraju,. World Water and Environmental Resources Congress, Salt Lake City, Utah, 27 June–1 July 1 2004.
  - “Solute Transport by Surface and Subsurface Water with Run-on on Spatially Variable Hillslopes,” **N.Nahar** and R.S.Govindaraju. ICHWAM-2002 Conference by J.N.T.University, Hyderabad, India, 18-20 December 2003.
  - “Surface Runoff and Infiltration with Run-on on Spatially Variable Hillslopes,” **N.Nahar** and R.S.Govindaraju. Proceedings of the Second Federal Interagency Hydrologic Modeling Conference held in Las Vegas, Nevada, USA, 28 July-1 August 2002.
  - “Influence of First-Order Degradation on Spatial Moments of the PNE/CNE Model,” **N. Nahar**, R.S. Govindaraju. American Society of Civil Engineers (ASCE) International Water Resources Engineering Conference in Seattle, Washington, 8-11 August 1999.

<b>RESEARCH PROJECTS</b>
<b>AFFILIATION: NORTH SOUTH UNIVERSITY, DHAKA, BANGLADESH</b>
<p><b>1. DOCTORAL THESIS (CO-SUPEVISING)</b></p> <p>“Development of Integrated Hydrological Landscape Framework for Water Sensitive Urban Design : A Case of Eastern Part of Dhaka Metropolitan Area” by Ayesha Siddiqua, Department of Architecture, Bangladesh University of Engineering and Technology, Fall 2017 (Co supervising with Professor Dr. Farida Nilufar, Dept of Architecture, BUET).</p>
<p><b>2. MASTERS THESIS (CO-SUPERVISED)</b></p> <p>“A low cost drinking water treatment system for slum dwellers of Dhaka city, Bangladesh and a</p>

comparative study with commercially manufactured water filters” by Shafayet Ahmed, Department of Civil and Environmental Engineering, Idaho State University, Idaho, USA, Summer 2017. (Co-supervised with Dr. Bruce Savage and Dr Arya Ebrahimpur). A manuscript has been submitted to the ‘Journal of Health Science and Engineering’ journal (Springer publication) and is under review.

### 3. UNDERGRADUATE RESEARCH

1. “Identification of Key Indicators and Development of Severity Index for Field Inspection of Urban Drainage Structures in Bangladesh” by Irtiza Ahmed, Department of Civil and Environmental Engineering, North South University, Fall 2017
2. “Assessment of Integrated Rainwater Management Alternatives for Urban Environment: Case Study North South University” by Md. Wasi Uddin and Md. Mohaiminul Islam, Department of Civil and Environmental Engineering, North South University, Fall 2017.
3. “Improvement of flash flood warning device Shanbandhu through coupling with Hydrologic models”, worked with PI Dr. Sirajul Islam, Co-PI Dr. Nova Ahmed and Sifat Kalam, Fall 2017.
4. “Recycled water: Alternate source of water for firefighting in Dhaka City” by Tushon Dey, Department of Civil and Environmental Engineering, North South University, Fall 2018.
5. “ Preliminary investigation of water and sanitation condition of Uttara Lake Slum” by Farhana Aktar and Md Owaid Hossain, Department of Civil and Environmental Engineering, North South University, Fall 2018. Dr. Shama E Haque, Associate Professor of CEE was the co-researcher in this project.
6. “Modular Green Roof System Design for Hot, Wet and Humid Tropical Climate” by Mostafizur Rahman, Sanjoy Paul, and Sheikh Muhtasim Abid, Department of Civil and Environmental Engineering, North South University, Summer 2019. Ms. Ismat Hossain, Faculty member of Department of Architecture is a co-researcher in this project.

### CONSULTANCEY PROJECT COMPLETED

#### AFFILIATION: OCREEDS, DHAKA, BANGLADESH

**Name of project:** Landscape of WASH in IWRM in Bangladesh

Year: 2018-2019

Location: Bangladesh

Client: WaterAid Bangladesh

Position held: IWRM and Gender Expert

**Main Responsibilities:** This project has three primary goals: identify WASH related gaps in the existing IWRM policy, review the process of the local level participation in implementing these policies and recommend opportunities to include WASH in the existing IWRM policies. Major responsibilities included detailed review of existing WASH and IWRM policies in Bangladesh and provide feasible recommendations that support

achievement of Sustainable Development Goal (SDG) #6.

**AFFILIATION: NORTH SOUTH UNIVERSITY, DHAKA, BANGLADESH**

**Name of Assignment or project:** Strengthening Regional Cooperation for Wildlife Protection Project (SRCWP)

**Year:** 2014-2015

**Location:** Chittagong Hill tracts, Bangladesh

**Client:** World Bank

**Position held:** Engineering Expert

**Main Responsibilities:** This project involved design and implementation of a spring-stream management plan for the residents of Pablakhali protected area in the Chittagong Hill tracts. The plan includes design and construction of water management measures such water retention pond, velocity reducers along the conveyance route, retention gallery, and retention wall with spillway. In 2017, a technical report titled 'Watershed Management and Biodiversity of Pablakhali Protected Area' was published featuring different aspects of this project (Chapter 5 talks about the watershed management plan).

**AFFILIATION: URBAN SYSTEMS LTD., RICHMOND, BC, CANADA**

**Name of Assignment or project:** Integrated Stormwater Management Plan for Old Logging Ditch and Burrows Ditch Watersheds

**Year:** 2009-2011

**Location:** Surrey, BC, Canada

**Client:** City of Surrey, BC

**Position held:** Water Resources Engineer

**Main Responsibilities:** The project involved developing an Integrated Stormwater Management Plan for Old Logging Ditch and Burrows Ditch Watersheds that includes agricultural areas in the north and residential areas in the south. The objective of the ISMP was to recommend stormwater management strategies for the upper development that also conforms to the lowland management strategy. Major responsibilities included detail hydrologic and hydraulic modelling using MIKE SHE and MIKE 11 under both present and future conditions. MIKE SHE is an integrated physically based model that simulates different physical processes i.e. infiltration, evaporation,transpiration, and runoff and integrates seamlessly with the hydraulic model in MIKE 11. Responsibilities also included cost estimates for different management strategies.

**Name of Assignment or project:** Stormwater Servicing Plan for City of Surrey Neighborhoods, BC

**Year:** 2009-2010

**Location:** Surrey, BC, Canada

**Client:** City of Surrey, BC, Canada

**Position held:** Water Resources Engineer

**Main Responsibilities:** The project involved developing stormwater servicing strategies for neighbourhoods in the City of Surrey (Newton Town Centre; Anniedale / Tynehead). Major responsibilities included hydrologic and hydraulic analysis to develop feasible and efficient servicing strategies focusing on “low impact development” and “best management practices” to reduce runoff volume and provide runoff quality benefits for receiving watercourses. Generally NCP studies involves review of background and site information; simulating runoff conditions with computer modeling; formulating and assessing with the model alternative management strategies; coordination with City staff; reporting; and participation in consultation processes.

**Name of Assignment or project:** Port Mann / Highway 1 Design and Build Project

**Year:** 2009-2011

**Location:** Vancouver, BC, Canada

**Client:** H5M Consortium, BC, Canada

**Position held:** Water Resources Engineer

**Main Responsibilities:** The Port Mann / Highway 1 Project (PMH1) upgrades the transportation corridor of Canada Highway 1 from approximately Hastings Street (Cassiar Tunnel) in Vancouver to the 200th Street Interchange in the City of Surrey, a distance of roughly 33 kilometers. In addition to constructing a new 10-lane crossing of the Fraser River, in general the highway will be expanded from 4 to 6 (or 8) lanes and interchanges along the route will be improved. The Project includes improvements to the existing drainage infrastructure within the Project corridor in order to provide a consistent level of service throughout and to avoid or mitigate negative impacts on the highway and on adjacent lands, streams and other drainage infrastructures. Major responsibilities included modelling and assessment of integrity and capacity of the existing drainage system as well as the proposed drainage system to accommodate the proposed highway expansion and reconstruction. The work also includes development of stormwater management plan for two watersheds (out of four) impacted by the change in the existing highway design.

**Name of Assignment or project:** Coquitlam Watershed Review, BC

**Year:** 2008-2009

**Location:** Coquitlam, BC, Canada

**Client:** City of Coquitlam, BC, Canada

**Position held: Water Resources Engineer**

**Main Responsibilities:** The project involved development of a comprehensive drainage plan for the Partridge, Mantle and Fulawka Creeks watersheds. The presence of multiple stakeholders, several occurrences of landslides in the Fulawka Creek and water quality in the Coquitlam River are some of the key issues to be dealt with. In consultation with the City, a phased approach was adopted that includes the 1) Scoping study, 2) Comprehensive study and preliminary design and 3) Detailed design and implementation. Phase I was completed in February 2009. Major responsibilities were to review and assess background information and site conditions, identify opportunities and constraints, formulate preliminary mitigative actions, assist with stakeholder communications, and prepare a work program for a suggested course of action. The Phase II work completed in April 2011.

**Name of Assignment or project:** City of Langley Integrated Stormwater Management Plan (ISMP)

**Year:** 2009-2010

**Location:** City of Langley, BC

**Client:** City of Langley, BC

**Position held: Water Resources Engineer**

**Main Responsibilities:** The project objective was to develop an Integrated Stormwater Management Plan that primarily included identification of habitat and environmental values, opportunities and constraints, complete assessment of aquatic health and water quality, and review of infrastructure from Asset Management and Capital Planning perspectives. Responsibilities were conducting the analytical works including evaluation of the existing and future land use scenarios and drainage condition, identification of the critical components that should be included in the ISMP, Identification of streams potentially impacted by the development, and managing project schedules and budget.

**Name of Assignment or project:** Country Hills Crossing Staged Master Drainage Plan,

**Year:** 2009

**Location:** Calgary, AB, Canada

**Client:** Melcor Developments Ltd., AB, Canada

**Position held: Water Resources Engineer**

**Main Responsibilities:** The Staged Master Drainage Plan (SMDP) was developed for the proposed Country Hills Crossing Industrial Development, which is located at the northeast industrial area of Calgary, AB. The 58.23 ha area is predominantly agricultural with the cultivated land in the upper terrace being separated from the grassland in the lower terrace by an escarpment. The Staged Master Drainage Plan includes proposed stormwater detention facilities, overland drainage routes, water quality improvement facilities, and Low Impact Developments (LID) to mitigate the impact of development on the environment.

**Name of Assignment or project:** Greendale Flood Study

**Year:** 2009-2010

**Location:** Chilliwack, BC, Canada

**Client:** City of Chilliwack, BC

**Position held:** Water Resources Engineer

**Main Responsibilities:** In January 2009, parts of the City of Chilliwack, most notably the Greendale area, experienced severe flooding due to a combination of heavy snowfall and severe rainfall. Due to the severity and atypical nature of the flood, the City wanted to investigate the event. The primary objectives of the investigation were to find out the probable factors that caused this event, the significance of the event and potential remedies to mitigate future damages. MIKE SHE and MIKE 11 were used for the hydrologic and hydraulic modelling.

**Name of Assignment or project:** Hyland Creek Pond 3 Feasibility Assessment

**Year:** 2009-2010

**Location:** Surrey, BC, Canada

**Client:** City of Surrey, BC

**Position held:** Water Resources Engineer

**Main Responsibilities:** The Hyland Creek Integrated Stormwater Management Plan (ISMP) (Urban Systems Ltd., 2007) recommended construction of three ponds to service this area (namely, the northern part of Zone 1 plus Zone 1A). The objectives of Hyland Creek Pond 3 Feasibility Assessment were to determine whether the need for two of these ponds could be eliminated by consolidating the detention storage on a single site in the Newton Town Centre area and what would be the impact of Pond 3 on the stream downstream in terms of erosion.

**AFFILIATION: ASSOCIATED ENGINEERING LTD, BURNABY, BC, CANADA**

**Name of Assignment or project:** Integrated Stormwater Management Plan for Erickson Creek

**Year:** 2007-2008

**Location:** Surrey, BC, Canada

**Client:** City of Surrey, BC:

**Position held:** Water Resources Engineer

**Main Responsibilities:** The project involved developing an Integrated Stormwater Management Plan for Erickson Creek watershed. This includes agricultural areas in the north and residential areas in the south. Major responsibilities included detail hydrologic and hydraulic modelling using



XP-SWMM and GIS and analysis of the drainage conditions under both present and future. The objective of the ISMP was to provide stormwater management strategies for upland development that also conforms to the lowland management strategy.

**Name of Assignment or project:** Flood Plain Bylaw Analysis

**Year:** 2007-2008

**Location:** Kelowna, BC, Canada

**Client:** City of Kelowna, BC, Canada

**Position held:** Water Resources Engineer

**Main Responsibilities:** The objective of this study was to analyze the 200-year flood profile along the Mill creek and to produce a feasible floodplain map that would lead to establishment of an effective floodplain bylaw in accordance with Section 910 of the Municipal Act. The study involved complex analysis of the dependencies among Mill creek, Mission creek and Okanagan lake systems. For hydraulic analysis and flood plain delineation, HEC-RAS and GIS were used. Responsibilities included management of the project, conduct analysis and provide direction/guidance to the modeller, liaison with client and preparation of the report.

**Name of Assignment or project:** Rodgers and Marr Creeks Integrated Stormwater Management Plan

**Year:** 2005-2006

**Location:** West Vancouver, BC, Canada

**Client:** District of West Vancouver, BC, Canada

**Position held:** Water Resources Engineer

**Main Responsibilities:** The main objective of the project was to develop an Integrated Stormwater Management plan for Rodgers and Marr Creek Watershed in West Vancouver. Major responsibilities included data analysis using GIS and detail hydrologic and hydraulic analysis integrating XP-SWMM and GIS. Prepared draft report including alternative management strategies and recommendations to reduce the impact of development on watershed health and ensure the integrity of the creeks.

**Name of Assignment or project:** Foreshore Improvement Plan for Bermuda International Airport

**Year:** 2006

**Location:** Bermuda, British Overseas Territory

**Client:** Bermuda International Airport Authority

**Position held: Water Resources Engineer**

**Main Responsibilities:** This project was intended to develop foreshore improvement plan for Bermuda International Airport. The investigation focused on two main options: grading improvements within the currently available land base including restoration of the existing foreshore retaining wall; and, foreshore infilling and erosion protection to allow relocation of existing South Perimeter Road to an alignment further setback from the runway. Responsibilities included designing shore protection structures, and preparing report.

**Name of Assignment or project:** Harmony Estates Lower Hyde Creek Development

**Year:** 2007

**Location:** Coquitlam, BC, Canada

**Client:** City of Coquitlam, BC, Canada

**Position held: Water Resources Engineer**

**Main Responsibilities:** Major responsibilities included development of conceptual design of stormwater management plan for a 45-lot subdivision. Assessed pre-and post-development conditions and recommended feasible stormwater management strategies using SWMM 5.0. Recommendation included Low Impact Development techniques with analysis being done in Water Balance Model (WBM). Responsibilities also included dealing with client, and preparing report.

**Name of Assignment or project:** Flood Plain Evaluation for Brooklyn Creek

**Year:** 2006

**Location:** Comox, BC, Canada

**Client:** Town of Comox, BC, Canada

**Position held: Water Resources Engineer**

**Main Responsibilities:** The project involved assessment of the current floodplain condition, and more specifically analysis of the elevation and capacity of the Balmoral Avenue culvert to determine the potential of failure. Also to assess the risk posed by any such failure. Responsible for hydrologic and hydraulic modelling in Visual HYDRO, report preparation including recommendations regarding specific modifications to reduce the risk of failure at the Balmoral Avenue culvert, and evaluating the effects of the Prichard Road high flow diversion. Also investigated whether this infrastructure provides a basis for reducing the Flood Control Levels and setbacks prescribed in the Town Bylaw.

**Name of Assignment or project:** Byrne Creek Daylighting in Ernie Winch Park

**Year:** 2007

**Location:** Burnaby, BC, Canada

**Client:** City of Burnaby, BC, Canada

**Position held:** Water Resources Engineer

**Main Responsibilities:** The main objective of this project was to perform feasibility assessment of Byrne Creek daylighting within Ernie Winch Park in Burnaby. Besides daylighting, other viable options such as having a detention pond or a wetland were considered. Responsibilities included completion of hydrologic and hydraulic analysis of the existing drainage system and feasibility study of daylighting Byrne Creek along with a two-stage water quality pond, management of project schedules and report preparation.

**Name of Assignment or project:** Watershed Yield Study

**Year:** 2007-2008

**Location:** City of Nanaimo, BC, Canada

**Client:** City of Nanaimo, BC, Canada

**Position held:** Water Resources Engineer

**Main Responsibilities:** This project involved watershed yield study of Nanaimo watershed. A dam and reservoir was proposed on the South Nanaimo River. The new reservoir would provide additional storage for drought periods and future demands. Major responsibilities included detailed analysis of the watershed yield using UBC Watershed Model. Using daily maximum and minimum temperatures and precipitation data, the UBC Watershed Model calculates daily watershed outflow resulting from snowmelt and rainfall. The effect of climate change on the watershed yield was also investigated as part of the assessment, using the Canadian CGCM3 climate model.

**Name of Assignment or project:** Willoughby Community Park Stormwater Management Plan

**Year:** 2006-2007

**Location:** Langley, BC, Canada

**Client:** Township of Langley, BC, Canada

**Position held:** Water Resources Engineer

**Main Responsibilities:** Developed Stormwater Management Plan for Willoughby Community Park in Township of Langley. The recommended facilities included conceptual design of two-phase detention ponds conforming to the park Master Plan, and Low Impact Developments (LID) to comply with Latimer Creek Master Drainage Plan (MDP). Responsibilities included management of the project, detail modelling and analysis using SWMM 5.0, liaison with client and preparation of

final report.

**Name of Assignment or project:** Percy Perry Park Artificial Turf Drainage Investigation

**Year:** 2007

**Location:** Coquitlam, BC, Canada

**Client:** City of Coquitlam, BC, Canada

**Position held:** Water Resources Engineer

**Main Responsibilities:** This project involved investigation of the drainage problem occurring in the Percy Perry Artificial Turf Field. Ponding was observed on the field even during a typical storm event. Responsibilities included detail analysis of different drainage components of the turf field, investigation of the product test results from manufacturers and the designers, management of the project, analysis of the drainage problem, recommendation of possible solutions and report preparation.

**Name of Assignment or project:** Stormwater Drainage Plan for Cranbrook Airport Runway Extension

**Year:** 2006-2007

**Location:** Cranbrook, BC, Canada

**Client:** Cranbrook Airport Authority, BC, Canada

**Position held:** Water Resources Engineer

**Main Responsibilities:** Designed stormwater drainage plan to maintain safe and efficient operation of the airport. Goals were to prevent flooding, maintain water quality in the receiving water bodies, protect fish habitat and mitigate potential erosion and sedimentation problems. Developed hydraulic and hydrologic model in SWMM 5.0, analyzed pre-development and future development conditions for 10-year storm event, and provided recommendations for minimizing development effects through detention ponds and grassed swales.

**Name of Assignment or project:** Mosaic Homes Stormwater Management Plan

**Year:** 2006

**Location:** Burnaby, BC, Canada

**Client:** City of Burnaby, BC, Canada

**Position held: Water Resources Engineer**

**Main Responsibilities:** Involved with development of stormwater management plan for redevelopment of a 5.59 ha site. Responsibilities included investigation of available alternatives to manage extreme event runoff. Options included detention storage at two locations within the development site, online detention storage in a nearby gulley, diversion of flows to the adjacent Byrne Creek, and over controlling upland flows to compensate for increased flows resulting from the development. Prepared draft report.

**Name of Assignment or project: Guildford Detention Pond Review**

**Year:** 2007

**Location:** Surrey, BC, Canada

**Client:** City of Surrey, BC, Canada

**Position held: Water Resources Engineer**

**Main Responsibilities:** Feasibility analysis of a community detention pond proposed at 15399 Guildford Drive in Surrey. Developed detailed hydraulic and hydrologic model based on the City's GIS database using XP-SWMM. Performed detail analysis of the existing small lot detention facilities and feasibility analysis for the proposed detention pond.

**Name of Assignment or project: Hydrologic and Hydraulic Analyses of Ungauged Watersheds throughout BC**

**Year:** 2005-2008

**Location:** BC, Canada

**Client:** Government of BC, Canada

**Position held: Water Resources Engineer**

**Main Responsibilities:** Conducted numerous hydrologic and hydraulic analyses of ungauged watersheds throughout BC for resource road development, highways and municipal clients. These assignments have provided the basis for sizing culverts and bridge spans. And included flow estimation using various methods, and frequency analyses using Consolidated Frequency Analysis (CFA) software.