



Proposal for
Environmental Consultant Services for the Completion of
Risk Assessments and the Provision of Contract
Administration and Construction Oversight Services for
the Sydenham Pearl Brownfield Site

March 2013

Submitted to

**The Corporation of
the City Of Brantford**

Submitted by



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1. Proponent's Qualifications, Experience, and Past Performance with Similar Projects

CH2M HILL Canada Limited (CH2M HILL) is a global leader in full-service engineering, construction, and operations services. What differentiates CH2M HILL is our strong commitment to partnering with clients to achieve their full strategic and operational agendas. Our goal on every project is not just to meet requirements but to outperform, delivering innovative, yet practical solutions. The result: a distinguished track record of value-creating client successes on projects of every scope and size across every continent.

With a network of 10 offices across the country, CH2M HILL serves eastern and central Canada through its Canadian headquarters in Toronto and offices in Ottawa and Kitchener/Waterloo. We are also able to draw on the strength of the CH2M HILL family of companies' global network, which allows our clients to access the resources and expertise of a staff of more than 30,000 in nearly 350 offices around the world. Since its formation, CH2M HILL has been winning awards from Canada's most recognized engineering associations and all levels of government for innovation and excellence in its engineering projects. Of particular relevance to this project are our capabilities as an industry-leading environmental firm. We have extensive experience in carrying out environmental site assessments (ESAs) and risk assessment (RAs), preparing remediation strategies, and providing contract administration and construction oversight on challenging environmental projects. Our expertise in these areas are reflected in the long-standing working relationships we enjoy with our environmental clients, as well as in our projects that have been selected as recipients of a "Brownie" Award by the Canadian Urban Institute (<http://canadianbrownfields.ca/>) over the last 5 years. We are proud of these awards recognizing our excellence in brownfield redevelopment at sites in Hamilton and Toronto.



The following project descriptions demonstrate our qualifications, expertise, knowledge, and experience in carrying out ESAs, RAs, and remediation strategies, and in providing contract administration and construction oversight for assignments similar to those proposed.

1.1 Project #1 – West Don Lands Site Brownfield Redevelopment

The environmental characterization of the West Don Lands (WDL) site is a typical project delivered by CH2M HILL's Environmental Business Group. Assessing a brownfield property, preparing RAs, reporting on findings, and conducting remediation are all typical to an environmental characterization project. The biggest determining factor in the WDL's success was whether it was possible to meet the extremely aggressive schedule for this very public project in the midst of a changing regulatory environment in Ontario. The short answer is: yes. It was.

Understanding the Vision – Revitalizing the site involved preparing 36 hectares (ha) for the 2015 Pan/Parapan American Games Athletes' Village (PAAV), in the short term, and in the longer term, mixed-use buildings, housing, parks, and roads. The future land owners and the Ontario Ministry of the Environment (MOE) had to be assured that the site's environmental status had been characterized and mitigated, as appropriate. This involved understanding the contaminant distribution across the site and employing the appropriate measures, including risk management measures (RMMs), as determined through the RA process, remediation, or a combination. From project startup, the Infrastructure Ontario (IO)/CH2M HILL team was clear about how success would be defined for WDL. Success would mean that development of the lands would not be delayed, that schedules would be met for all milestones, that quality deliverables would expedite stakeholder endorsement, and that developers would be engaged with clear understanding of constraints and risks. In addition to these goals, CH2M HILL strove to exceed client expectations – and our reputation as a leader in performing RAs for brownfield development was further enhanced.

Key Components of the Project – In April 2010, CH2M HILL initiated work, conducted field investigations, and prepared multiple Phase One, Phase Two, and RA reports concurrently in order to meet the aggressive project schedule. The reports complied with Ontario Regulation (O. Reg.) 153/04 under the *Environmental Protection Act*, as amended by O. Reg. 511/09, so that Records of Site Condition (RSCs) were obtained on the properties prior to development. At each step of characterization, risk assessment, risk management, and remediation, multiple stakeholders were engaged, including the MOE.

In summary, four Phase One reports were produced, along with eight Phase Two reports, eight RA reports, and eight Remedial Options Feasibility (ROFS) reports. Eleven Certificates of Property Use were also finalized, and 13 RSCs were finalized and acknowledged by the MOE.

Risk Assessment – CH2M HILL assembled an RA team to complete 8 RAs for the 60 blocks in the WDL and obtain MOE endorsement/acceptance on them. The accelerated schedule required technical and team leadership to secure consensus from the MOE and other stakeholders throughout the process. An added challenge to successful delivery included a recent change in the regulations governing RA activities in Ontario, as well as uncertainty surrounding the implementation of the new regulations, given the timing of the RAs and RSC filing. Strategic communication with the regulator and client was critical for the RAs to meet the new regulations, as appropriate.

To complete the RAs on time, approximately 25 RA staff (including human health and ecological risk assessors) were used for the duration of the project, and communication systems were put in place to support the effective flow of information both between RA team members and other teams contributing to the RA reports (that is, the Site Assessment, Risk Management, and Publications Services teams). In addition, the RA team worked to automate and streamline multiple RA processes, and to achieve consensus on the building blocks and technical approach to the RAs with the client and regulator prior to report production. The success of this strategy and team structure was evident in the consistent ability of the team to produce high-quality RA reports, each compiled within 2 weeks; typically, this process takes about 3 months.

In all, 25 risk assessors were coordinated, 8 draft and 8 final reports were produced, and more than 100,000 pieces of data were considered.

Communications – During the project, CH2M HILL communicated with numerous stakeholders involved with the WDL site, many of whom did not have experience operating within the environmental arena. To work with them successfully, we educated them on the site's regulatory process. This education started with kick-off meetings with each stakeholder and continued throughout the project, with regular meetings held weekly and biweekly.

Remediation – Project Site Details:

Services Provided:

- Phase One and Two ESAs
- Risk Assessments and Develop Remedial Strategies
- Construction Oversight

Remediation approach: Excavation and removal to meet the site-specific standards and capping

Standards achieved: Site-Specific Standards

Timeline: **18 months**

Costs: Confidential

Award: This project won the **2011 Brownie Award** as the project that best demonstrated Excellence in Project Development at the Neighbourhood Scale and the **2012 Brownie Award** for Best Small Scale Project and Contribution to Public Realm

Reference: Monisa Nandi, Environmental Specialist, Infrastructure Ontario, 416-327-8001,

Monisa.Nandi@infrastructureontario.ca

1.2 Project #2 – Hamilton Health Sciences

To support its plans for the potential acquisition of the site from the City of Hamilton, Hamilton Health Sciences (HHS) retained CH2M HILL to conduct detailed Phase One and Phase Two ESAs, a designated substance and building waste survey, an RA, and a remedial action plan (RAP) on the Wellington Development Block, located immediately west of Hamilton General Hospital (HGH). CH2M HILL prepared all demolition and remediation specifications for this project and managed the abatement, demolition, remediation, and restoration work. We also assisted in redevelopment options for the various parcels of land that make up the larger property.

Phase One activities included a site history review, site inspections, interviews, an evaluation of information and reporting. The Phase One ESA concluded that the Block has the potential for soil and groundwater contamination, with 19 potential areas of concern noted, including metals, polychlorinated biphenyls (PCBs), asbestos-containing materials, gasoline, diesel, and underground storage tanks (USTs).

The goal of the Building Waste and Designated Substance Survey was to identify wastes and substances that would present health and safety or environmental concerns and the associated management and abatement requirements for these substances.

The Phase Two ESA characterized the Block’s geology and hydrogeology, to support a RAP and associated cost estimate. It involved collecting chemical data associated with subsurface soil and groundwater, and assessing the potential impacts to the subsurface based on MOE criteria. Tasks included reviewing and interpreting previous environmental reports, conducting site reconnaissance, and developing a borehole drilling program and a soil and groundwater analytical program to provide additional characterization of the Block.

A site-specific RA feasibility study was performed as part of the Phase Two ESA to provide a preliminary determination as to whether contaminants at the Block could be managed in place.

The screening-level RA demonstrated that there was no need for supplemental RMMs beyond isolating contaminants of concern (COCs), monitoring the groundwater, and maintaining barriers as required. It was determined that applying an RA approach as part of the RAP was likely to provide a successful, cost-effective approach to managing the soil and groundwater impacts identified at the site.

On behalf of HHS, CH2M HILL completed a MOE-approved comprehensive RA for the property to develop Property Specific Soil and Groundwater Standards in accordance with O. Reg. 153/04.

The cost of the ESAs and RA were offset by a Federation of Canadian Municipalities’ Green Municipal Fund grant of \$175,000, along with a \$20,000 grant provided through the City of Hamilton’s Environmental Remediation and Site Enhancement (ERASE) program.

CH2M HILL developed tender documents and contract specifications for the demolition of the former Steel Company of Canada (SCOC) Facility located on the property; and oversaw the demotion activities, which included management and abatement of designated substances. The demolition was completed on schedule and below the estimated budget.

CH2M HILL developed tender documents and contract specifications to remediate soil at the former SCOC facility located north of HGH and immediately east of the Wellington Block. Prior to the start of the project, CH2M HILL negotiated with the remediation contractor to reduce their bid price by approximately \$120,000. Our team oversaw the soil remediation activities, which included filing an RSC for the property before HGH expansion onto remediated lands, which the MOE recognized on June 12, 2007. The remediated lands previously served as a parking area for hospital staff. Following demolition of the former SCOC facility and MOE acceptance of the Wellington Block RA, the parking lot was relocated to the Wellington Block.

The Canadian Urban Institute recognized the HHS Wellington Development Block Brownfield Redevelopment project with a 2009 Brownie Award for its leadership, innovation, and environmental sustainability in Brownfields redevelopment. HHS president and CEO Murray Martin called the award “an outstanding achievement for our team at Hamilton Health Sciences and our contractor CH2M HILL. I am deeply proud not only of the final product, but the fact that Hamilton Health Sciences is able to play a large role in the economic and environmental rehabilitation of this area of Hamilton.”

Remediation – Project Site Details:

Services Provided:

- Phase One and Two ESAs
- Risk Assessments and Develop Remedial Strategy
- Preparation of Tender Document, Procurement, Contract Administration
- Construction Oversight

Remediation approach: On-site isolation/ barrier controls, Monitored natural attenuation

Standards achieved: Site-Specific Standards

Timeline: **20 months**

Costs: Confidential

Award: This project won the **2009 Brownie Award** for Brownfield Redevelopment

Reference: Beth Manganelli, Director of Economic Development, Hamilton Health Sciences, 905-521-2100 ext 77446

1.3 Project #3 – Confidential Client, Amherstburg, Ontario

CH2M HILL is currently decommissioning and demolishing a large abandoned chemical manufacturing facility; including the removal, disposal, and treatment, as required, of all designated substances, raw materials and product; as well as hazardous and non-hazardous materials and waste contained within the existing process equipment, tanks, reservoirs, and piping.

This facility was abandoned abruptly when the former owner declared bankruptcy and was vacant for a number of years before acquired by Amherstburg Land Holdings. Because it had remained vacant for so long, the site was in disarray and the buildings in advanced structural deterioration due to the products and byproducts of the former manufacturing process.

CH2M HILL worked with the client to provide support through the purchase of the site, then arranged and commissioned a series of engineering assessments to gather sufficient information to develop a bid package for the demolition. The engineering studies included structural assessments of the property to determine those buildings that unsafe for further entry and concurrently arranged for the consolidation, labeling, classification, and registration of the quantity of subject wastes that remained on the property. In addition, a hazardous building material assessment was completed to identify and quantify the presence, location, and quantities of designated substances at the site. Following completion of the engineering assessments, CH2M HILL developed bid specifications and arranged an invitation to bid to a select group of experienced demolition firms that were capable of completing the full scope of work. CH2M HILL supported the bidding process and helped our client select the best demolition contractor for the work. Subsequently, we successfully negotiated an alternative bid with specific salvage management and asset recovery requirements. This eventually resulted in a cash positive position for the client. In addition, we met with the regulators, to establish appropriate monitoring during demolition.

We are currently providing onsite construction management services during demolition and are documenting compliance with plans and applicable regulations.

Remediation – Project Site Details:

Services Provided:

- Data Gap Review and Phase Two ESA
- Risk Assessment and Development of Remedial Strategy
- Preparation of Tender Document, Procurement, Contract Administration (ongoing)
- Construction Oversight (ongoing)

Remediation approach: Demolition, excavation and removal, capping, monitored natural attenuation

Standards achieved: Site-Specific Standards

Timeline: **2010 - Ongoing**

Costs: Confidential

Reference: Richard W. Galloway, Remediation Manager, tel: 973-455-4640, email:

rich.galloway@honeywell.com

1.4 Project #4 – Sydenham Pearl ESAs

The Sydenham Pearl Brownfield in downtown Brantford consists of two properties, 17 and 22 Sydenham Street, with a total area of 2.4 ha. The site's long industrial history dates back to the early 1900s and consists primarily of roofing material and electrical fixture manufacturing. The onsite buildings were razed in the early 2000s, and the brownfield is currently vacant and undeveloped. The City of Brantford became the owner of the site in 2006 following unsuccessful tax sales. Concurrent with and following the tax sale, City staff conducted an extensive public consultation program to identify neighbourhood priorities for redevelopment of the site. The public response was focused on future residential and parkland redevelopment.

In the spring of 2012, CH2M HILL was retained to provide environmental consulting services focused on future residential/parkland land uses. The work conducted by CH2M HILL included Phase One and Two ESAs and the

Remediation – Project Site Details:

Services Provided:

- Phase One and Two ESAs
- Develop Remedial Strategy
- Risk Assessment and Review Remedial Strategy
- Preparation of Tender Document, Procurement, Contract Administration
- Construction Oversight

Proposed Remediation approach: Excavation and removal, barrier wall, in-situ contaminant treatment, monitored natural attenuation

Standards proposed: Site-Specific Standards

Timeline: **2012 (For 'Services Provided')**

Costs: Confidential

Reference: Mr. Paul Moore, Manager of Policy Planning, City of Brantford, 519-759-4140 ext. 2348

development of a Remediation Strategy for the brownfield. Concurrent with completion of this work, meetings were held with Brantford municipal personnel, a public consultation program was conducted to both obtain information from the public and to communicate the results of work being completed, and the final reports were presented to the Brantford City Council.

The Remedial Strategy includes the completion of a risk assessment, followed by various actions to either manage or actively remediate contaminants. While the preferred remedial strategy will be reviewed and potentially revised upon completion of the RA, currently contemplated remedial activities include limited 'hot spot' excavation, the construction of treatment barriers, and in-situ contaminant treatment.



2. Experience and Qualifications of the Project Lead

As illustrated on the organizational chart in Exhibit 2-1, Ed Taves will be the Project Lead (PL). He holds a Double Honours B.A. (Chemistry and Biology) and an M.A. (Biochemistry), is licensed as a Professional Geoscientist (P.Geo. Ltd.) and Chartered Chemist (C.Chem.), and is designated as a Qualified Person for ESA (QP_{ESA}) by the MOE. Ed has more than 23 years' experience in Phase One/Two ESAs, ROA, and site remediation programs, including contract administration projects. For the last 15 years he has typically served as the PL, responsible for understanding clients' project objectives (technical deliverables) and the cost/schedule limitations, then developing and maintaining project teams with the required designations, experience, and availability to complete the project successfully. Ed recognizes that effective communication – including client, public, and regulatory liaison – is a critical component of every project. He has worked directly with municipal departments, presenting to municipal councils, the public, and the MOE. Ed has served as the PL for many projects for municipal clients, including projects in support of Brownfield assessment and acquisition subsequent to failed tax sales, and ROA and implementation for all types of land uses, including parkland and residential. Remedial options considered have included RA for the development of PSSs, reducing active remedial requirements and costs. Ed has served as the PL for nearly half of CH2M HILL's projects resulting in the filing of RSCs post July 1, 2011 under the current requirements in O. Reg. 153/04. Ed was the PL for the following representative projects; refer to his resume in Appendix A for further information:

West Don Lands (WDL); Ontario Infrastructure and Lands Corporation (IO); Toronto, Ontario (see Section 1 for a full project description). As the PL, Ed developed and maintained a team to complete 4 Phase Ones, 8 Phase Twos, and 8 ROAs concurrently, in support of 8 RAs and the filing of 13 RSCs, under an aggressive schedule. A team of approximately 70 professional, technical, and support staff; and subcontracted trades was established. He was responsible for reviewing project needs, identifying specialist resources identified, and adjusting prior specialist commitment to meet project needs. Roles were defined, staff chartered, and the team maintained through vacations, sickness, and changing priorities. Contact was maintained with the client, Account Manager, and QP_{ESA} to identify and meet project objectives.

Project Site Details and Reference: Please refer to Project #1 in Section 1

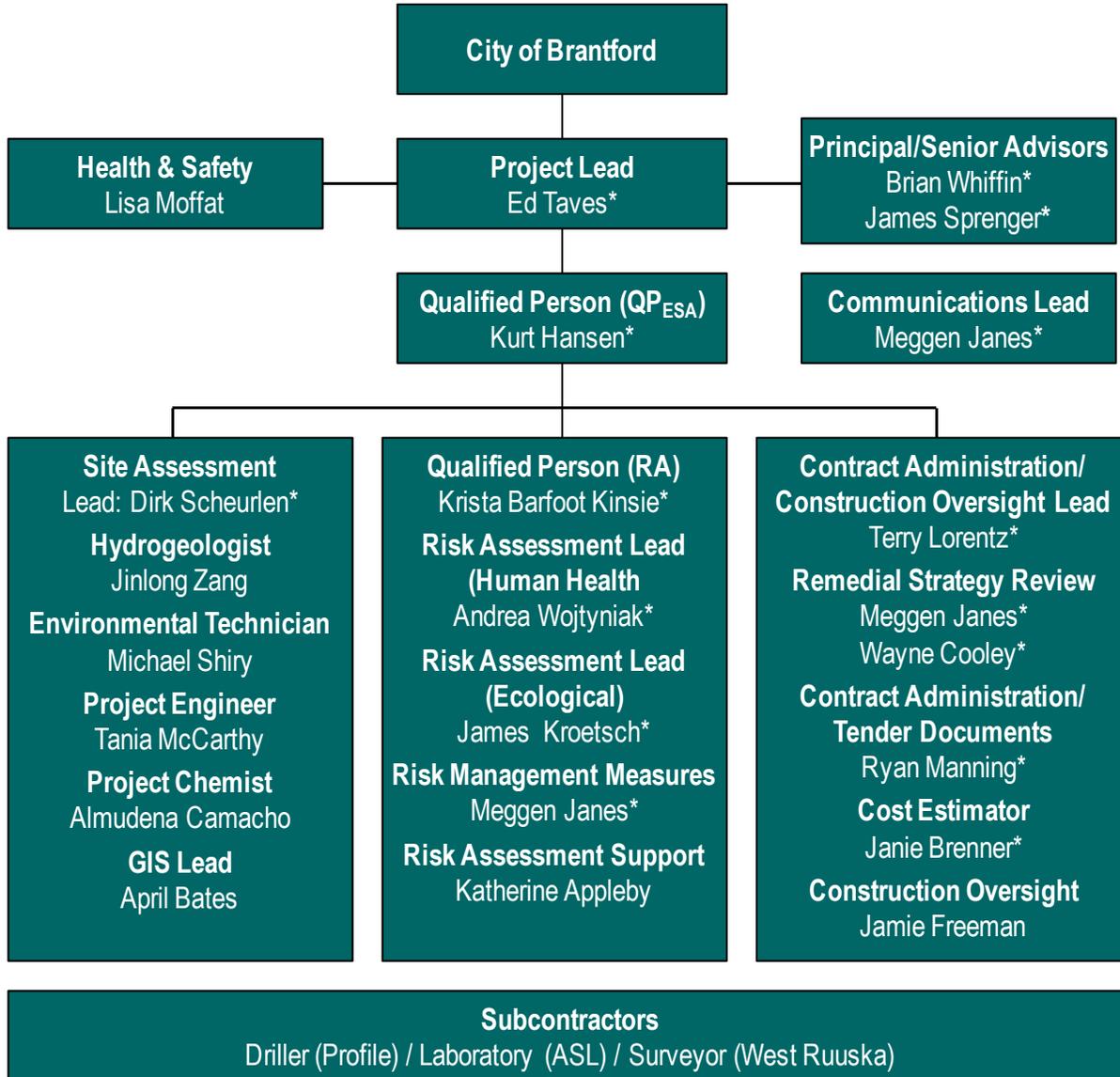
Phase Two ESA, Remedial Action Planning, Contract Administration; Reichhold Industries Limited, Ontario. Ed is the PL providing ongoing assistance to Reichhold for the management of environmental matters for two former chemicals plants. Work has included Phase One/Two ESA activities, groundwater monitoring in association with ongoing monitored natural attenuation and phytoremediation programs, soil gas assessment, remedial action planning, demolition activities, contaminant excavation, in-site contaminant treatment, contract administration/ construction oversight in support of demolition and remediation programs. Remedial options evaluated have included *in situ* chemical oxidation and bioremediation, soil mixing with zero valent iron, excavation and offsite disposal, and RA activities. Ed played a leading role in the presentations that have been made to public and legal audiences. Targeted excavation and offsite disposal, and in situ chemical oxidation and bioremediation projects have been completed.

Project Site Details:
 Timeline: **3 years, ongoing**
 Costs: Confidential
Reference: Brian Kanzler, Site Remediation - Environmental Engineering Manager, Reichhold Inc., 1-919-990-7509, Brian.Kanzler@reichhold.com

Confidential Client, Amherstburg, Ontario (see Section 1, Project 3 for a full project description). As the environmental task manager, Ed managed the team to complete data gap analysis and Phase Two ESA activities. RA and remedial option analysis activities are occurring at this time.

City of Brantford (see Section 1, Project 4 for a full project description). Ed was the PL for the completion of the Phase One and Two ESAs, and the development of the remedial strategy. He also played a lead role in the public consultation program and provided a presentation to Council.

Exhibit 2-1 – Organizational Chart



Notes:

- Resumes Provided (Resumes can be provided upon request, for other individuals shown)
- Project staffing subject to change based on availability at time work is to be completed.



3. Experience and Qualifications of the Qualified Person

As shown in Exhibit 2-1, Kurt Hansen will be the Qualified Person (QP) for this project. He holds a B.E.S. and a M.E.S. in Environmental Studies and is a licensed P.Geo. Kurt has more than 22 years' experience in Phase One and Two ESAs, site remediation programs, and field investigations involving soil and groundwater sampling and monitoring. Kurt is a QP_{ESA}, and has been responsible for filing more RSCs post July 1, 2011 under the current requirements in O.Reg. 153/04 than any other QP_{ESA} within CH2M HILL. These RSCs were also formally acknowledged by MOE, submitted with approved risk-based standards, and often involved remediation to address contamination. Kurt is well versed in current reporting methods for Phase One and Two ESAs to support RSC filing and understands in detail the current RSC and RA regulatory process. He was QP_{ESA} for the following representative projects*:

WDL; IO; Toronto, Ontario (see Section 1, Project #1 for a full project description). As QP_{ESA} for the WDL project, Kurt managed and directed field investigations and prepared 4 Phase One reports and 6 Phase Two ESA reports for 60 blocks of the 36-ha WDL under an accelerated schedule. The ESA team supervised by Kurt evaluated data at approximately 290 areas of potential environmental concern (APECs) identified through the Phase One ESAs and over 500 sample locations across the site (including more than 290 monitoring wells). Data generated was used to build a conceptual site model (CSM) for each RSC Property to comply with post July 1, 2011 regulatory requirements. As QP_{ESA}, Kurt led the ESA reporting and the associated site assessment summaries that were included in the RA Reports, liaised with the MOE to integrate current requirements into the ESA reports and RSC documents, was responsible for the completion of the 13 acknowledged RSCs to date, served as technical liaison with the RA teams to realize efficiencies, and certified that the remediation strategy was implemented. This effort clearly demonstrates his expertise in developing and implementing site remediation work for the purposes of obtaining an RSC(s) with the MOE. Two of the acknowledged RSCs were under O. Reg. 153/04 (before July 1, 2011) and 11 were under O. Reg. 153/04 as amended by 511/ (after July 1/11).

Project Site Details and Reference: Please refer to Project #1 in Section 1

One Wellington Development Block Brownfield Redevelopment; Hamilton Health Sciences; Hamilton, Ontario; 2004 to 2007. Kurt was Site Assessment Lead Phase One ESA and Senior Technical Advisor for this project which involved the completion of Phase One and Phase Two ESAs, a designated substance and building waste survey, risk assessment, and a remedial action plan on the Wellington Development Block located immediately west of Hamilton General Hospital (HGH), in support of plans for the potential acquisition of the site from the City of Hamilton. CH2M HILL prepared all demolition and remediation specifications for this project and managed the abatement, demolition, remediation and restoration work. CH2M HILL also assisted in redevelopment options for the various parcels of land that make up the larger property.

Project Site Details and Reference: Please refer to Project #2 in Section 1

As senior ESA lead, Kurt served as site assessment lead for completion of Phase One activities, which included a site history review, site inspections, interviews, an evaluation of information and reporting. The Phase One environmental site assessment concluded that the Block has the potential for soil and groundwater contamination, with 19 potential areas of concern noted, including metals, PCBs, asbestos-containing materials, gasoline, diesel, and USTs. Kurt provided senior technical guidance and support to subsequent phases of the project as required.

Sydenham Pearl Brownfield; City of Brantford; Brantford, Ontario; 2012. Kurt was the Qualified Person for the ESA and Preparation of the Remediation Strategy for this project, which involves two parcels of land in downtown Brantford, both with industrial legacies dating back to the early 1900s. CH2M HILL was retained to conduct Phase One and Two ESAs, and to prepare a Remedial Action Strategy to revitalize the properties for potential residential development. Work included consultation with city staff, a public meeting, and presentations to City Council. Work was completed to the satisfaction of the City, the public, and City Council, and resulted in the approval of funds for implementation of the remedial strategy.

Project Site Details and Reference: Please refer to Project #4 in Section 1

Port Stanley ESA, RA, and RAP; PWGSC; Port Stanley, Ontario (see Section 1 for a full project description).

Kurt supervised the initial 2006 Phase Two ESA and ROA leading to the selection of RA in conjunction with remediation to address “hot spot” contamination areas (under federal requirements) as the recommended remediation strategy. In 2008, under Kurt’s direction as QP_{ESA}, a data gap evaluation and supplemental were completed to address provincial regulatory requirements for filing an RSC imposed as part of the transfer of lands to the municipality. In 2010, Kurt supported the public consultation program and represented the client at the information sessions. As a result of regulatory changes that came into force in mid-2011, Kurt is acting as QP_{ESA} for a Phase Two to address the new regulatory requirements for completion of the RA and filing of RSCs on four distinct properties.

Project Site Details:

Land area: 11.7 ha

Volumes of contamination remediated: 87,000 m³

Remediation approach: RA with “hot spot” remediation

Standards achieved: Risk-based property-specific standards

Timeline: **2008 to date**

Costs: \$437,000 (Phase One/Two ESA & RA-'08-'11);

\$351,000 (Phase Two update-'11-'12)

Reference: (i) Brad Simpson, Senior Environmental Specialist, PWGSC, 416.512.5732, brad.simpson@pwgsc-tpsgc.gc.ca (ii) Donald Leitch, Chief Administrative Officer & Clerk, Municipality of Central Elgin, 519-631-4860 Ext. 276, dleitch@centralelgin.org

Redevelopment of King & Adelaide Property; Toronto Community Housing Corporation; Toronto. Kurt was the Project Manager and QP_{ESA} managing and supervising the updated Phase One and Two ESAs, remedial strategy evaluation, subsequent remediation, and RSC filing. The site was located at 288 King Street East and 501 Adelaide Street East in Toronto. Based on the ESA findings, Kurt delineated the volume of subsurface materials requiring remediation, evaluated remedial options, and estimated remedial costs. Subsequently, Kurt led the development of tender documents and specifications for remediation and provided contract administration and remediation oversight. Upon completion of remediation, CH2M HILL filed an RSC under O. Reg. 153/04 documenting the change from industrial to residential land use. MOE acknowledged the RSC.

Project Site Details:

Land area: 0.3 ha

Volumes of contamination remediated: 4,675 m³

Remediation approach: Excavation

Standards achieved: Residential land use

Timeline: **3 months**

Costs: \$49,429

Reference: Peter Zimmerman, Housing Development Manager, Development Division, TCHC, 416-981-4404, Peter.zimmerman@torontohousing.ca



4. Experience and Qualifications of Remaining Proponent Team Members

The remaining project team members are included in the organizational structure shown in Exhibit 2-1, and an overview of their qualifications and experience for this project is provided in Exhibit 4-1 on the following page. All project team members will report through the PL and work under the technical oversight of the QP_{ESA} (see Sections 2/3). Other key team members include the following:

i. Task Leads

- Meggen Janes, Communication and Remedial Strategy
- Dirk Scheurlen, Site Assessment Lead
- Krista Barfoot, Risk Assessment/ Qualified Person (QP_{RA})
- Terry Lorentz, Contract Administration/Construction Oversight

ii. Principal/Senior Advisors

- Brian Whiffin
- James Sprenger

A drilling contractor (Profile), analytical lab (ASL), and surveyor (West & Ruuska) will be subcontracted if additional intrusive work is required. No subconsultants are proposed. CH2M HILL confirms that all project team staff are currently available to fulfill their proposed role on this project. If key staff changes are required at the time work is to be completed, Brantford personnel will be consulted for their concurrence. References and contact information are provided for each team member in Exhibit 4-1. The numbers cited under References and Common Experience refer to the projects highlighted in Section 1.

Exhibit 4-1 –Qualifications and Experience

Project Team Member/Role	Personal Skill or Specialty that applies to this Project	Qualifications, Expertise, and Past Performance on Similar Projects ¹				References and Common Experience ^{2,3}
		Education	Designations	Years	Similar Projects	
Meggen Janes Communications, Remedial Strategy, RMMs	Effective communicator for environmental projects and remediation strategies developed from completing many high-profile similar assignments	B.A.Sc. M.Sc.	P.Eng. PMP QP _{ESA}	22	- Communications lead on Projects #1, 2 & 4, responsible for managing stakeholder and public communications - RSC team lead for Project #1, responsible for filing 13 RSCs	#1, 2 & 4 Other
Brian Whiffin Principal/Senior Advisor	Contributes environmental remediation strategy gained from similar projects and as a Task Force Member for the National Brownfield Strategy	B.A.Sc. M.Eng.	P.Eng. F.E.C. QP _{ESA}	30	- QP _{ESA} for RSC filing following the remediation of a former Stelco property to facilitate redevelopment for health care facilities which received a Brownie Award in 2009 - Senior advisor, project manager or senior consultant for numerous brownfield project, including developing and facilitating public information sessions, advising on remediation programs	#2 & 4 Other
James Sprenger Principal/Senior Advisor	Senior risk assessor and QP _{RA} for multiple RAs prepared under the amended regulation and for filing of RSCs	B.Sc. M.Sc. (candidate)	QP _{RA}	19	- Senior human health risk assessor and senior consultant for the development of risk management plans for multiple RAs, 8 of which have been accepted by MOE and used to support filing of an RSC for Project #1 - Senior human health risk assessor for Project #3	#1 #3 Other
Dirk Scheurlen Site Assessment Lead	Thorough knowledge of Phase Two requirements under O. Reg. 153/04 (as amended)	Diploma	OACETT	22	- Coordinated multiple field teams leading to MOE acceptance of Phase Two documentation and acknowledgement of 13 RSCs for Project #1 - Project manager for Project #2, and Site Assessment Task Lead for Project #4 - Project manager/investigation lead for a Stelco site remediation leading to an RSC filing	#1, 2 & 4 Other
Krista Barfoot QPra, Human Health RA	Senior risk assessor for completion of multiple RAs leading to filing an RSC under the amended regulation	B.Sc. M.Sc. Ph.D.	QPRA	9	- Senior risk assessor for completion of 8 RAs that have been acknowledged by MOE including the development of PSSs leading to the filing of RSCs for Project #1 - Served as RA Task Manager for Project No. 3	#1 & 3 Other
Terry Lorentz Contract Admin/ Construction Oversight Lead	Extensive experience in contracting and cost estimating for site remediation	BES, Post-Grad Diploma	N/A	13	- Construction advisor providing support for remedial options feasibility studies, construction costing, excavation, soil management, and soil disposal. Provided support related to preparing and developing remediation bid documents for Project #1 and 3. - Construction advisor supporting remedial options feasibility studies and construction costing for Project #4	#1, 3 & 4 Other
Jinlong Zang Hydrogeologist	Thorough understanding of hydrogeological requirements under O. Reg. 153/04 (as amended)	B.A.Sc. M.A.Sc.	P.Eng.	15	- Hydrogeologist responsible for hydrogeological testing and analysis to support filing of 13 RSCs as part of Project #1 - Hydrogeologist for Project #4, and for Phase Two update to support a planned RSC filing for Project #3	#1, 3 & 4 Other
Andrea Wojtyniak Risk Assessment Lead	Intermediate risk assessor for completion of multiple RAs leading to filing an RSC under the amended regulation	B.Sc.	N/A	7	- Intermediate risk assessor for completion of 8 RAs that have been acknowledged by MOE including the development of PSSs leading to the filing of RSCs for Project #1 - Intermediate risk assessor for RA being completed for Project #3, as well as numerous other projects	#1 & 3 Other
Michael Shiry Environmental Technician	Knowledge and experience with new Phase Two sampling requirements as field technician for multiple ESAs leading to RSC filing under O. Reg. 153/04 (as amended)	B.E.S.	N/A	4	- A key environmental technician responsible for borehole drilling, soil sampling well installation and environmental sampling under the stringent requirements of O. Reg. 153/04 (as amended) leading to the filing of multiple RSCs, Project #1 - Lead environmental technician for Project #3, responsible for groundwater sampling for Project #4	#1, 3 & 4 Other
Tania McCarthy Project Engineer	Proven track record for successful reporting of Phase One and Twos under O. Reg. 153/04 (as amended)	B.A.Sc.	N/A	9	- Under the direction of the QP, prepared Phase One and Two reports and RA sections to support filing of 13 RCS under Project #1 - Project engineer for Projects #3 and 4. Played key role in data management, interpretation and reporting.	#1, 3 & 4 Other
Almudena Camacho Project Chemist	Thorough understanding of data quality management and documentation requirements under O. Reg. 153/04 (as amended)	B.Sc. MQM	C of P – Industrial Hygiene	8	- Under the direction of the QP, reviewed all laboratory test reports relative to data quality objectives and produced data quality documentation for Project #1, 3 and 4	#1, 3 & 4 Other
April Bates GIS Lead	Insights into spatial data management and mapping requirements for MOE acceptance of RSCs and related documentation	BES	N/A	11	- Managed spatial data and produced mapping to meet the data quality and accuracy requirements for successful filing of 6 RCS under the amended regulation for Project #1	#1, 2, 3 & 4 Other
Wayne Cooley Remediation Strategy	Strong focus on the development and implementation of site remediation plans	B.A.Sc. M.A.Sc.	P.Eng.	16	- Senior engineer for remediation option assessment, key contributor for vapour control considerations, contributor to Project # 3	#3 Other
Jamie Freeman Construction Oversight	Strong technical knowledge and practical experience leading field activities for environmental and construction projects	B.Sc.	C.E.P.I.T	10	- Senior engineer for evaluation and costing of remedial options for Project #1 - Program lead for Environmental Engineering Post-Diploma program at Conestoga College	#1, 2 & 3 Other
Jim Kroetsch Ecological RA	Extensive insights into the ecological RA requirements for filing of RCSs	F.W.T. B.Sc. M.Sc.	QP _{RA} CCEP	24	- Senior ecological risk assessor for Project #1 including MOE acceptance of 8 RAs prepared to address the requirements of the amended regulation - Senior ecological risk assessor for Projects #2 and #3	#1, #2 #3 Other
Ryan Manning Tender Documents/ Contract Administration	Design and construction engineer for remediation projects including development of specification and tender documents, plus contract administration	B.A.Sc.	P.Eng.	12	- Project engineer to develop remedial cost estimates for Project #3 - Development of specifications and tender documents for the Deloro Mine Site Cleanup - Construction engineer/contract administration for remediation of chlorinated solvents in soil - Onsite supervision of hydrocarbon remediation at a site in the Yukon Territory	#3 Other

NOTE: The above tabular summary presents a concise overview with the following additional notations:

¹ Please see appended resumes for further information on the experience and qualification of the project team

² The project numbers in this column refer to Projects #1 to 4 presented in Section 1 – Where applicable, additional common projects where the team has worked together are shown as “other”

³ References have been limited to the projects in Section 1 – Additional references can be provided upon request



5. Comprehensive Project Understanding, Approach, and Methodology

5.1 Introduction

The City retained CH2M HILL in March 2012 to provide environmental services for two properties known as the Sydenham-Pearl Brownfield, located within Brantford at 17 and 22 Sydenham Street. The City required environmental services to complete Phase One ESAs, Phase Two ESAs, and a review of remedial strategies to support the redevelopment and/or potential sale of the site for residential/parkland land use. The recently completed site assessment activities at the Site were initiated to assess the current subsurface environmental conditions and develop technically-feasible and cost-competitive management strategies to manage impacted soil and groundwater.

The results of the Phase One and Phase Two ESAs recently completed by CH2M HILL between June and September 2012 were documented in the following reports:

- i. CH2M HILL Canada Limited (CH2M HILL). 2012. Phase One Environmental Site Assessment, 17 Sydenham Street, Brantford, Ontario. September 6, 2012, (CH2M HILL, 2012)
- ii. CH2M HILL Canada Limited (CH2M HILL). 2012. Phase One Environmental Site Assessment, 22 Sydenham Street, Brantford, Ontario (Final Report). September 6, 2012, (CH2M HILL, 2012a)
- iii. Phase Two Environmental Site Assessment, 17 Sydenham Street, Brantford. Prepared by CH2M HILL for Brantford, dated September 26, 2102, Final Report, (CH2M HILL, 2012b)
- iv. Phase Two Environmental Site Assessment, 22 Sydenham Street, Brantford. Prepared by CH2M HILL for Brantford, dated September 26, 2102, Final Report, (CH2M HILL, 2012c)

Based on the results of the Phase Two ESAs, it was determined that the Phase Two Properties did not meet the applicable Ministry of the Environment (MOE) Site Condition Standards for various contaminants of concern in both soil and groundwater. Remediation of impacts above the Table 3 SCS would be required and/or the development of property specific standards (PSS) under the completion of a risk assessment (RA) would be warranted, in order for a Record of Site Condition (RSC) to be obtained for the Phase Two Properties.

Upon completion of the Phase Two ESAs, and as required as part of the previous scope of work, CH2M HILL completed a Remedial Options Evaluation for each Phase Two property. The focus of the Remedial Options Evaluations was to assess and evaluate various management strategies that could be employed to address the soil and groundwater impacts identified during the completion of the recent Phase Two ESAs and that would facilitate the future filing of a RSC for a future parkland/residential land use scenario. The reports also provided opinions regarding probable cost to manage impacted soil and groundwater present at the properties. Based on the Phase Two ESA findings, this evaluation considered general subsurface conditions, such as the degree of delineation of the contaminants of concern (COCs), suspected volume of material requiring remediation, and potential pathway connections.

The results of the Remedial Options Evaluation recently completed by CH2M HILL for the subject properties were documented in the following reports:

- i. CH2M HILL Canada Limited (CH2M HILL). 2012. Remedial Options Feasibility Study, 17 Sydenham Street, Brantford, Ontario, dated October 12, 2012, Final Report
- ii. CH2M HILL Canada Limited (CH2M HILL). 2012. Remedial Options Feasibility Study, 22 Sydenham Street, Brantford, Ontario, dated October 12, 2012, Final Report

As summarized in the above noted Remedial Options Evaluation reports, based on the review of environmental management options and their comparison to the evaluation criteria, it was recommended that the City undertake the steps to complete an RA for both Sites. It is anticipated that the RA will indicate that supplemental remediation efforts (example, hot spot excavation) will likely be required to reduce reported maximum contaminant concentrations and mitigate the off-Site migration of contaminated groundwater. In addition, for the 22 Sydenham Site it was further

recommended that the limited excavation approach be completed in conjunction with the UST decommissioning activities to achieve effective remediation of the Site.

5.2 Project Objective

CH2M HILL understands the project objectives to be as follows:

- i. Obtain an RSC for each of 17 and 22 Sydenham Street, to facilitate the potential future redevelopment of the properties for residential or parkland uses
- ii. Improve the aesthetic appeal of each property by removing remaining construction demolition debris, and concrete slabs and footings

The principal work activities to be completed to meet these objectives are:

- i. Completion of an RA for each of 17 and 22 Sydenham Street to establish PSSs and to identify Risk Management Measures (RMMs) required for future development. Completion of the RA will require consultation and review by both the public and MOE and is estimated to require 10 months to complete (detailed in Sections 5.3 and 6.1, Schedule)
- ii. Refinement of the Remedial Strategy documents to meet the requirements of the RAs (detailed in Section 5.4)
- iii. Prequalification of contractors for construction of the anticipated Remedial Strategy (detailed in Section 5.5)
- iv. Preparation of tender documents, tendering, and assisting the City with the award of a contract(s) to satisfy the Remedial Strategy (detailed in Section 5.6)
- v. Contract administration and construction oversight, acting as the City's Engineer (detailed in Section 5.7)
- vi. Project Management (detailed in Section 5.9)
- vii. Filing of RSC for each of 17 and 22 Sydenham Street (detailed in Section 5.8)
- viii. Communication strategy, including public information sessions and presentation to Council (detailed in Section 5.10)

The following sections outline our proposed approach and methodology for meeting the project objectives.

5.3 Risk Assessments

Based on our current understanding of the soil and groundwater concentrations and the recommendations outlined in the Remedial Options Feasibility Studies, the RA approach is considered the most practical and cost effective means to obtain an RSC for the subject sites. One RA will be completed for 17 and one RA for 22 Sydenham Street, in support of obtaining two separate RSC. CH2M HILL has had recent communication with the MOE that suggests that a joint RA may be permissible under Regulation 153/04 for an area that will have two RSCs, and we will pursue this approach further to provide, if one RA is permitted, additional efficiencies to the City.

CH2M HILL proposes to complete an RA to support a risk-based RSC, using the requirements set out under O. Reg. 153/04, as amended. The main tasks will be as follows:

- i. Task 1.1: Integrate data from Phase Two ESAs
- ii. Task 1.2: Complete and Submit the Pre-Submission Forms (PSF) to the MOE
- iii. Task 1.3: Complete the RA (Human Health and Ecological)
- iv. Task 1.4: MOE Review Process and Issuance of a Certificate of Property Use (if required)

5.3.1 Integrate data from Phase Two ESA

The Phase Two ESA reports recently completed will provide input into the RA for ready use of the dataset documenting maximum site concentrations.

5.3.2 Complete and Submit Pre-Submission Form to the MOE

A Pre Submission Form (PSF) is completed early in the RA process as part of the initial Problem Formulation phase of the RA. The PSF must be submitted by the Qualified Person for Risk Assessments (QP_{RA}) before the completed RA is submitted. The purpose of the PSF is to provide the MOE with information regarding the site from the Phase One and Two ESAs, and to outline the receptor scenarios that are being included in the RA, as identified in the Conceptual Site Model (CSM). This provides the MOE with the opportunity to comment on the scope and approach chosen for the RA.

The City also retained CH2M HILL to assess the groundwater quality hydraulically downgradient of the subject sites. Volatile organic compound (VOC)-impacted groundwater has been identified on both Sites, specifically chlorinated aliphatic hydrocarbons (CAHs), including trichloroethylene (TCE), 1,1,1-trichloroethane (TCA), and their degradation products. Additional soil and groundwater samples were collected as part of this additional work in the fall of 2012 to assess the soil and groundwater quality at six off-Site drilling locations. In addition, a further round of groundwater samples was collected from both the six off-Site wells as well as 21 selected on-Site wells. The results of the additional soil and groundwater sampling conducted at both offsite and onsite locations recently completed by CH2M HILL are documented in the following report:

- i. CH2M HILL Canada Limited (CH2M HILL). 2013. Results of Additional Soil and Groundwater Sampling Sydenham-Pearl Brownfield 17 and 22 Sydenham Street, Brantford, Ontario. February 7, 2013.

Based on the findings from the directly above-noted report, and the findings from the previously completed Phase Two ESAs, it is anticipated that some limited additional intrusive investigation work will be required to address potential issues that may be flagged by the MOE during their review of the PSF. More specifically, we anticipate the need to install a few soil vapour probes as well as some limited additional soil and groundwater sampling to address concerns that may be raised by the MOE during the review of the PSF. CH2M HILL has included a budget allowance for this additional work, as outlined in the cost summary section of this proposal. Prior to conducting any additional intrusive work, a work plan will be prepared for review and approval by the City in advance documenting the proposed additional sampling and associated methodology and rationale.

For scheduling purposes, following our submission of the PSF to the MOE for review, the MOE will prepare a letter of response concerning the scope of the RA and confirming the review timeline for the RA. To date, the MOE has not established a timeframe for their review of the PSF, although they have an unofficial target of 4 to 6 weeks. Should there be a significant delay in receiving comments on the PSF, portions of the RA could proceed to the draft report stage. However, it will be necessary to wait for the MOE's comments on the RA approach (as intended by the PSF) before finalizing the RA.

5.3.3 Completion of the Risk Assessment (Human Health and Ecological)

The RA will be completed following the *Procedures for the Use of Risk Assessment Under Part XV.1 of the Environmental Protection Act* (MOE, 2005) and the generic risk approach presented by the MOE in their *Rationale for the Development of Soil and Ground Water Standards for Use at Contaminated Sites in Ontario* (revised version April 15, 2011). The receptor scenarios will focus on potential scenarios associated with the potential for residential development.

Additional necessary information regarding plausible receptor exposure scenarios and the characteristics of the Site will be determined during the data review and in consultation with others, to identify potential future Site activities.

Under O. Reg. 53/04, it is not sufficient to estimate the magnitude of risk to human health and the environment. As part of the RA process, numeric PSSs must be determined for each COC, based on the methodology used in the RA. In accordance with the regulation guidance, this would be addressed and included in Section 6 of the RA report.

Risk management may include strategies to limit receptors' contact with COCs at the site, if deemed necessary as a result of the risk evaluation. The RA will recommend RMMs that may be necessary to be protective of human and ecological receptors, both on- and off-site. This Risk Management Plan (RMP) must identify exposure pathways and environmental media that the RMP intends to address. The proposed risk management strategies would be included

as Section 7 of the RA report. Conceptual design of RMMs, if needed, will be completed in the RA; detailed design will need to be completed during site development engineering and planning, which is outside of our scope. Ensuring that areas of the properties remain paved or covered would be considered risk management. Risk management strategies may also include remediation to reduce contaminant exposure to the PSSs. The development of remediation targets and risk management measures can be an iterative approach in which the balance between remediation and Greenfield (concrete removal) restoration is considered and optimized to suit the City's objectives. If RMMs such as long term groundwater monitoring are required, the costs for such RMMs will not be included in the scope of work, cost and scheduling considerations provided herein.

CH2M HILL will prepare a draft report in PDF and text in Microsoft Word format for review by the City. After we receive the City's comments, CH2M HILL will prepare the final report and provide the City with two signed hard copies of the final report and one signed electronic copy in PDF format. Reports will be signed by the project QP_{RA}. Under O. Reg. 153/04 as amended, there are mandatory requirements for RA reports, and the report must include sections as listed in Table 1 of Schedule C of O. Reg. 153/04. The MOE also mandates the number of copies for RA submissions, and we will fulfill these requirements for distribution and submission of the RA. For the purpose of this workplan and budget estimate, it has been assumed that one MOE review cycle will be required for acknowledgement of the RA.

The City should be aware that it is often difficult to predict the time and level of effort that may be required to address MOE PSF and RA review comments. Given the nature of the process, it has been our experience that, in many instances, the MOE does not acknowledge and accept RAs following the first review, and they often have comments and requested modifications that are required before acceptance. CH2M HILL has assumed an estimated budget to address the MOE's review comments. However, upon receipt of these comments, CH2M HILL will determine the level of effort required to address them. If there are any potential budget implications as a result of the level of effort required, CH2M HILL will prepare a scope change for review and approval by the City prior to proceeding with any additional work. CH2M HILL has included some time during this process to generally liaise with the MOE and to provide updates to the City. It is important that the City understand that, once comments are incorporated into the RA, the 16-week timeline starts again (potential for up to 32 weeks of review or more if two RA submissions are required).

5.3.4 MOE Review Process and Issuance of a Certificate of Property Use (if required)

After the RA report is finalized, it will be submitted to the MOE for review. The current prescribed period of time (22 weeks for a Wider Area of Abatement [WAA] RA or 16 weeks if it is not designated WAA) for review begins when the RA report is received by the MOE and the MOE confirms that the report meets the requirements of the regulation. Once the MOE's review is complete, the objective is to obtain formal MOE approval of the RA, which is a prerequisite to filing the RSC.

The MOE may issue a Certificate of Property Use (CPU) for any property for which an RA has been completed; this is issued at the discretion of the MOE Director, based on the results of the RA. Typically, if risk management is required, a CPU will be issued to ensure the longevity of any RMMs. A CPU may limit use of the property, restrict construction of certain types of buildings, or require certain actions (such as ongoing monitoring and reporting). The municipality is notified when a CPU is issued; this may require registration of the property title and the provision of financial assurance by the City or future developer/owner, if applicable. We expect that the local District Office of the MOE will engage the City in the development of the draft CPU. We can review the CPU to verify content and consistency with the RA. The draft CPU is then posted to the EBR for public review. As previously noted; if RMMs such as long term groundwater monitoring are required in the CPU, the costs for such RMMs will not be included in the scope of work, cost and scheduling considerations provided herein.

5.4 Review of Remedial Strategy

Once the Risk Assessments are completed and the Property Specific Standards (PSSs) have been established and approved by the MOE, the final requirements for excavation and in-situ remediation or other remedial measures can be finalized.

Once the remediation targets are established, the conceptual design presented in the Remedial Options Feasibility Study (ROFS) can be refined. The remedial excavation and in-situ remediation program will be tailored to the Site-specific needs. The conceptual design in the ROFS can then be refined at this stage so that we can review the cost estimate, prepare tender documents, support Brantford with the tender review and selection of a preferred contractor, oversee execution of the remediation contract as the City's representative (Owner agent), and collect confirmatory samples and complete the associated reporting. Other initiatives related to greenfield restoration – such as concrete and foundation removal – can be incorporated into the onsite remedial works program to optimize contractor procurement and avoid conflicts between remedial and restoration objectives. We therefore recommend including greenfield restoration activities in the remedial contractor's scope of work.

5.5 Prequalification of Contractors

Subsequent to MOE review of the RAs and concurrent with their finalization for MOE approval, remediation contractors will be prequalified for consideration for remediation activities as will be outlined in the tender specifications to be prepared as summarized in Section 5.6. It is anticipated that:

- i. The City will provide their 'Request for Prequalification' form (RFPQ) to CH2M HILL for use
- ii. The RFPQ will functionally serve as a stand-alone information request as opposed to the first part of a 2-part tender process
- iii. CH2M HILL will revise the RFPQ form to identify the information to be supplied by prospective contractors
- iv. The draft RFPQ will be supplied to the City for their review. It is anticipated that any review comments will be received within one week. It is not anticipated that a meeting will be required with City technical staff at this stage
- v. The City will post the RFPQ on the City's website and complete any advertising. CH2M HILL will provide reasonable assistance to the City by identifying the name and contact particulars for any contractors it feels may be interested or capable or responding. It is anticipated that information will be required from prospective contractors three weeks after the RFPQ is posted
- vi. A copy of the responses received will be provided to CH2M HILL by the City
- vii. CH2M HILL will evaluate the responses and provide Brantford with a draft evaluation. One meeting will be held in Brantford with City technical staff to review the draft evaluation
- viii. CH2M HILL will finalize the evaluation including concerns raised at the meeting
- ix. Brantford will manage contractor concerns/queries. CH2M HILL will not be the direct point of contact for the contractors. CH2M HILL will provide reasonable assistance to the City in responding to question raised by contractors.

5.6 Greenfield Restoration and Remediation Specification Preparation

This task will involve the development of technical specifications (tender documents) for the planned environmental remediation work and concrete and foundation removal activities and associated site restoration of the subject facilities.

The general sequences of events that will need to be addressed in the technical specifications are as follows:

- **Mobilization and Site Preparation**
 - Mobilize necessary resources to Site
 - Contractor control of Site security and health and safety
 - Establish Contractor Site facilities and utilities
 - Establish a project equipment and material handling areas
- **Foundation Removal Activities**
 - Blind or disconnect utilities
 - Break all concrete or to a specified grade or depth

- **Remediation Activities**
 - Segregate at-grade and below-grade demolition waste streams
 - Excavate impacted soils (if applicable)
 - Other on Site/in-situ remedial strategies as outlined in the finalized Remedial Strategy reports (Sec. 5.4)
 - Collect stockpile samples for disposal characterization
 - Transport waste streams and soils to provincially-approved receivers
- **Site Restoration and Demobilization**
 - Remove all demolition related materials from the Site
- **Fill all Excavations to Restore Site Drainage**

The sequence of events would be summarized in the technical specification using the Master Specification numbering format. The Master Specification formats used by CH2M HILL (bid documents, contract forms, and contract conditions) are all formatted in accordance with the Engineer's Joint Contract Documents Committee (EJCDC®), while the Division 1 through 16 specifications follow the national guidelines of the Construction Specifications Institute (CSI). An example table of contents prepared for a similar project is shown in Exhibit 5-1:

Exhibit 5-1 – Example Table of Contents

Spec No.	Title
01000	General Requirements
	01010 Summary of Work
	01015 Site Access
	01020 General
	01030 Schedule
	01040 Coordination
	01200 Project Meetings
	01300 Submittals
	01645 Owner-Furnished Products
	01700 Safety
	01705 Training
	01710 Interferences
	01720 Permits
	01730 Security
	01735 Execution Plan
	01740 Damages
	01750 Utilities
	01755 Temporary Facilities and Services
	01760 Items Not Included in Project
	01800 Tanks and Reservoirs
	01810 Pits and Slabs
	01815 Subsurface Structures
	01820 Soil Compaction
	01840 Cuts and Caps
	01850 Site Work
	01860 Scrap and Salvage
	01870 Waste Disposal
	01880 Air Monitoring, Dust, and Noise Control
	01890 Material Control
02000	Earthworks and Environment
	01101 Environmental General Requirements
	01570 Environmental Management Plan
	02080 Asbestos Removal
	02201 Remediation Earthworks
	02210 Petroleum Storage Tank Removal (if applicable)
	02222 Designated Substances Management

5.6.1 General Conditions and Agreement

CH2M HILL has assumed that the City will provide the general conditions, financial terms, and agreement terms for the bid document and has not allowed for this task. CH2M HILL is able to assist the City in the development of these documents; however, the City will ultimately be legally bound by these documents and should therefore develop them in conjunction with legal counsel.

5.6.2 Review and Final Approval

CH2M HILL would propose to allow for two review stages in the preparation of the technical specifications. This will allow CH2M HILL to break down the review of the document into manageable component sizes. The result will be a more efficient review process, mitigating the potential for repetition and redundant language. The two review steps will generally conform to the following:

- **60 Percent Review Stage.** At the 60 percent review stage, CH2M HILL will provide the City with a completed table of contents, the sections relevant to the proposed works, and a framework for the bid form and associated documents. Our proposed schedule assumes that the City will return its review comments to CH2M HILL within 10 business days of receipt of the documents.
- **90 Percent Review Stage.** At the 90 percent review stage, CH2M HILL will provide the City with the final draft technical specifications. Our schedule assumes that the City will return its review comments to CH2M HILL within 15 business days of receipt of the documents.

Additional review stages caused by changes in the decommissioning scope of work after notice to proceed have not been included in the cost estimates for the technical specifications.

CH2M HILL will assist the City in bidding the remediation and concrete and foundation removal work by attending the Site tour and preparing an evaluation matrix for the bids. Addendum services during the bid period will also be provided.

CH2M HILL will review the supplier quotations and request clarifications where appropriate. CH2M HILL will attend a joint evaluation meeting to review the results of the tender request with the City where we will present our concerns and recommendations. CH2M HILL will provide bound copies of the final technical specifications.

5.7 Contract Administration, Remediation/Greenfield Restoration Oversight and Reporting

This task will involve overseeing and executing the remediation contract as the City's Representative (Owner agent). It will also include the collection of confirmatory samples and preparation of associated reporting documenting the remedial activities completed that will be required to support the planned filing of RSCs for the subject sites.

The key tasks and activities that will be completed are briefly summarized as follows:

- i. Check that a site health and safety plan is in place
- ii. Check that the contractor has a construction quality control plan
- iii. Have a representative on-Site on a full-time basis (assumed 10 hrs/day, 5 days per week, for an estimated period of 7 months) for remediation activities
- iv. Oversee contractor activities and approach to ensure that remediation costs are minimized to the extent possible through prudent staging and segregation of impacted soils
- v. Monitor Site environmental management (noise, dust, runoff, traffic, etc.) as provided by the contractor
- vi. Specify mobilization of support equipment, such as trailer, electrical, telephone, office equipment, etc.
- vii. Monitor the daily activities of the remediation contractor, including dispute resolution and change order management, track quantities as applicable and appropriate

- viii. Prepare daily site documentation requirements, including daily progress reports, daily work orders, field logs, photographs, daily chronology of events, and visitor logs
- ix. Facilitate weekly progress meetings with HHS and the remediation contractor
- x. Monitor that regulatory reporting requirements are satisfied
- xi. Monitor adherence to the technical specifications by the contractors
- xii. Monitor the project schedule
- xiii. Review contractor progress payment certificates and provide recommendations for payment as appropriate
- xiv. Provide recommendation to the Owner when substantial completion has been achieved
- xv. Prepare a written report documenting the remediation activities at the subject sites for inclusion in a final revised Phase Two ESA Report for each site as required under O. Reg 153/04

5.8 Record of Site Conditions

Records of Site Conditions will be prepared for both 17 and 22 Sydenham Properties. The RSC summarizes the environmental condition of the subject properties as determined by the Qualified Person (QP) for the subject sites, which is then filed in the Environmental Site Registry. The type of information on an RSC includes site description, property ownership, property use, site assessment information, certification statements by the owner and the QP, remedial action/mitigation, and any supporting documentation. This task will involve the completion of the required RSC application form for each of the subject sites (RSC completed using Property Specific Standards). Some of the administrative information needed for these forms will require input and authorization from others and can be obtained concurrent to the tasks described above.

The items required for RSC filing include:

Provided by the City:

- i. Lawyer's letter consisting of legal description
- ii. Property deed, transfer or other document
- iii. Current plan of survey
- iv. Owner Certification statement

Provided by the MOE and data entry by CH2M HILL:

- i. Table of PSSs with maximum site concentrations

Completed by CH2M HILL

- i. List and Figure showing Areas of Potential Concern for each property
- ii. Table of Current and Past Uses of property
- iii. Phase Two Conceptual Site Model

CH2M HILL will compile the applicable RSC forms for submittal to the MOE. The MOE upon reviewing the submission will provide a written acknowledgment of the filing to the owner and QP. If there are any deficiencies in the submission (in our experience, this is often administrative details such as the plan of survey or lawyer's letter), the MOE will require us to resubmit the RSC. We will attempt to mitigate this through advance communication with the MOE to verify that the documentation meets their requirements and have budgeted accordingly.

5.9 Project Management

A project management task has been included to provide general support to the City related to the proposed site remediation activities, and to assist in the development, planning, and implementation of future subsurface remediation and foundation removal tasks and associated decommissioning activities. Project management will be required to

facilitate the implementation of the program and the management of the selected remediation contractor for completion of the Site restoration and remediation work, and to assist the City in implementing the planned remediation activities safely with an acceptable level of quality and in resolving problems and issues should they occur.

As shown in Section 5.10, CH2M HILL proposes to hold a project kickoff meeting, in Brantford, Ontario at City Hall upon commencement of the project. The kickoff meeting will provide an opportunity for project team members to discuss key project issues and procedures, obtain additional information, and discuss any clarifications or issues related to the project schedule or changes to the scope of work. CH2M HILL has budgeted for our core project team to attend the initial kickoff meeting. We have budgeted what, based on our experience on other projects, is an appropriate level of effort for consultation and technical support to the City for issues related to environmental requirements/remediation and general contract support.

5.10 Communications Strategy

It is important to develop a communication strategy to proactively involve stakeholders early and on a continued basis in the project planning process, and to develop tailored activities and protocols to encourage and facilitate public participation and communication in an open and transparent forum. Early and continued consultation and dialogue is important for stakeholders – particularly for a complex project of long duration with significant community interest. The City has initiated communication through neighbourhood meetings and presentations at the Brownfields Community Advisory Committee. Leveraging the communication networks currently in place and established by the City, our communication strategy is based on the following objectives:

- i. To conduct open and inclusive activities that will engage a broad spectrum of the community in the project
- ii. To provide sound science and technical information in an accessible and understandable format
- iii. To focus effort on the Project rather than other agendas
- iv. To provide diversity in opportunities to participate
- v. To track and manage issues throughout the project to achieve community support and endorsement in the project

We suggest five meetings with the City's technical team as part of the Scope of Work: (1) Kick-off; (2) RA review; (3) finalization of remedial options; (4) review of bids; and (5) remediation closure. Three points of public engagement are planned as part of the Scope of Work and include Brownfields Community Advisory Committee presentations and neighbourhood meetings (or public information session): (1) summarize the work previously completed and the scope and anticipated outcomes of the current scope of work; (2) present the findings of the RA, finalization of remedial options and timing and presentation of the remediation team; and (3) remediation closure. We propose to present the final remedial results and RA to City Council after the completion of the project. We also understand that the City's technical team will be updating Council from time to time, and to that end, we will provide support with the information updates.

Details on the key presentations are provided in Exhibit 5-2. The project schedule in Appendix B provides proposed dates for the five meetings with the City technical team, the three public meetings and the City Council meeting. It is anticipated that these dates will be rescheduled to accommodate both project progress and City technical staff and Council schedule constraints.

We anticipate that our role in attending the public engagement meetings will be to provide a display of project information, make a brief presentation followed by a question and answer period, and prepare "take-away" materials for easy reference following the session. As before, the City will arrange the location and will prepare a Notice of Neighbourhood Meeting and direct mailing to the elected officials for that area, government and non-government offices (such as the Grand River Conservation Authority), and special interest groups. Materials for the meetings will be prepared in draft form for review and approval by the City prior to production. Once finalized, the material will be provided to the City for posting to the City's website.

Our team recognizes that attendance at public meetings is just the beginning in engaging members of the public and public advisory groups. We are adept at preparing and delivering significant amounts of technical information in easily

understood terms, as is evident through the three project examples presented in Section 1. Our team anticipates that public concerns with this project may be consistent in theme with the issues identified during other brownfield activities in the City and elsewhere. Accordingly, we have identified the following potential community interests that will require attention during the meetings: noise, sustainability, public health and safety, air quality, groundwater protection, waste materials, access to information, traffic, post- and during-construction aesthetics, and short-term/long-term use. CH2M HILL's dedicated public communication strategy lead, Meggen Janes, will take the initiative in anticipating and addressing the public's concerns and interest areas. She will lead the development of the presentation tools with input from the project team and attend the public meetings. Our team will use the intelligence gathered through the Brownfields Community Advisory Committee meeting to fine-tune the critical components of the overall remedial strategies presentation for the neighbourhood meeting. Similarly, the neighbourhood meeting will be used to gather additional public insight on concerns regarding the remediation/risk management.

Exhibit 5-2 shows an outline and schedule of the proposed public information sessions.

Exhibit 5-2 – Proposed Public Information Sessions

Public Information Session #1 (June 27, 2013)	
Purpose	<ul style="list-style-type: none"> • A brief overview of existing environmental conditions to be addressed • Outline the overall plan for the project and provide a forum to discuss key aspects of the plan and what it means for the community • Respond to issues that may have arisen to date
Key Content	<ul style="list-style-type: none"> • Explain purpose of the project and what the community can expect when it is complete • Overall high-level assessment of the risk • Report on findings of the off-site investigation • Major and minor project activities and sequencing • High-level review of project schedule and schedule for construction • "Things to Know and What to Expect" • Contact names and information for Questions Update on remedial options • Next steps
Expected Outcome	The opportunity to engage directly with the community upon project initiation will encourage adaptive management to facilitate continued efforts to deliver a successful project (as determined by both the project team and the community).
Value to the Project	With the opportunity to obtain current community opinions and concerns we will be able to adapt future presentations and written materials to include responses to community concerns, thereby improving the chances for community acceptance of the project objectives and outcomes.
Public Information Session #2 – Presentation of Remediation Team (September 4, 2014)	
Purpose	<ul style="list-style-type: none"> • Present an overview of the RA and finalization of remedial options and timing • Introduce the construction team to the community prior to the commencement of activities onsite • Outline the overall plan for the construction program and provide a forum to discuss key aspects of the plan and what it means for the community
Key Content	<ul style="list-style-type: none"> • Report on findings of the RA, and finalization of remedial options • Major and minor construction activities and sequencing • Schedule for construction • Mitigation and monitoring, contingency plans and what they mean • "Things to Know and What to Expect" • Contact names and information for Questions Update on remedial options • Explanation and graphic presentation of the steps in the construction process, including timing of major activities and approvals, where the soil is going, the community engagement and communications plans, and contact information • Community concerns and initial actions • Emergency and contingency planning • Next steps

Expected Outcome	<p>The opportunity to engage directly with the community after the completion of the RA will encourage adaptive management to facilitate continued efforts to deliver a successful project (as determined by both the project team and the community).</p> <p>Local residents and business owners will have an increased awareness of the projects and key activities to expect. This will be the first contact between the project team and the community, as well as an opportunity to establish a public relationship and develop profile for the project.</p>
Value to the Project	<p>Our team will use the information generated through the efforts of Public Information Session #1 to help fine-tune the critical components of the overall project. We will also have a clearer understanding of the current community concerns and issues and will be able to begin to address them before the start of major construction activities.</p>
Public Information Session #3 – Remediation Closure (March 12, 2015)	
Purpose	<ul style="list-style-type: none"> • Update the community on the construction phase of the project and any follow-up requirements • Provide details on construction completion (demobilization), post-construction activities, restoration, reporting, approvals and Year 1 monitoring activities
Key Content	<ul style="list-style-type: none"> • Status review of major and minor construction activities, challenges encountered, change management issues, success stories • Update on schedule for Project completion and schedule for short-term/long-term ongoing activities • “Things to Know and What to Expect” for the final phases of activities • Contact names and information for questions
Expected Outcome	<p>Community members will have information on the remainder of the planned project activities, including what to expect and when. They will also be provided with a take-away Facts Sheet with key reminders and contact information for the post-construction period.</p>
Value to the Project	<p>Because the Project may continue for some time following the physical construction stage, this point of contact with the community will demonstrate our commitment to continued communication during the final stages of the project. The team will also be able to gain an indication of the community’s collective opinion on the success of the Project.</p>
Presentation to Council (April 20, 2015)	
Purpose	<ul style="list-style-type: none"> • Update Council on the remediation and short-term/long-term risk management requirements • Provide details on construction completion (demobilization), post-construction activities, restoration, reporting, approvals and Year 1 monitoring activities • Report on the public consultation process or other public feedback on the Project
Key Content	<ul style="list-style-type: none"> • Status review of major and minor construction activities, challenges encountered, change management issues, success stories • Actual cost against budget; value-added components, and cost savings • Update on future Site requirements and schedule • Public consultation statistics
Expected Outcome	<p>Council will have information on the closure of the remediation and the future requirements, including what to expect and when.</p>
Value to the Project	<p>The Project continues following the physical construction stage, so this point of contact with the Council will serve as a final wrap-up of the remediation results and provide information on next steps.</p>



6. Project Schedule, Costs and Work Plan

6.1 Project Schedule

The anticipated project schedule, attached as Appendix B, shows the proposed timing of tasks and related interdependencies. Task lengths were based on the anticipated level of effort that is shown in the Resource Allocation Matrix (RAM), entitled “Hours Breakdown by Task,” which is also included in Appendix B.

The schedule of major project tasks outlined in Exhibit 6-1 is based on an anticipated project approval date of May 15, 2012.

Exhibit 6-1 – Schedule of Major Project Tasks

RA, from PSFs to MOE approval of draft RAs	June 2013 to April 2014
Review of remedial strategy	April 2014 to May 2014
Contract administration and construction oversight	May 2014 to March 2015
Remediation report, finalization of RA and filing of RSC	March 2015 to May 2015

The following will be occurring concurrent with the major project tasks shown above:

- i. The communication program – including meetings with City technical staff, public meetings and the meeting with Council – will be ongoing from June 2013 to April 2015
- ii. Project management activities will be ongoing from project initiation in June 2013 through to anticipated project completion in May 2015

The project schedule includes a project contingency period of approximately 3 months from late May to early August 2015. The project schedule as shown is based on CH2M HILL’s professional experience. The City will be kept informed of significant changes in the project schedule as they occur. For the filing of the RSC we have assumed that the RSC can be filed immediately upon completion of the remediation and that there is no long term groundwater monitoring to be complete per O. Regulation 153/04 prior to filing the RSC.

The project schedule does not include any post-remediation environmental monitoring requirements, as the nature and scope of these requirements cannot be known until the completion of the RA and remediation activities. Environmental monitoring requirements that may be reasonably anticipated would include soil vapour assessment activities, additional groundwater monitoring activities, and maintenance of any barrier or other in-situ treatment systems.

6.2 Project Costs and Work Plan

The Resource Allocation Matrix provided in Appendix B provides a summary of the anticipate level of effort by individual project team members for the major project work elements. The RAM indicates project costs of \$966,937 plus applicable taxes. Considerations in the calculation of these costs included the following:

- i. Hourly rates for staff are similar to those provided to the City for previous work associated with the Site.
- ii. Costs will be incurred on a time and materials basis to the limits shown on the RAM.
- iii. The RA budget includes an allowance for additional intrusive work. The need for and potential scope of this work cannot be known until completion of RA activities.
- iv. The budget for finalization of the Remediation Strategy includes an allowance for some additional intrusive work. The need for and potential scope of this work cannot be known until the Remediation Strategy is complete.

- v. Costs associated with construction oversight are based on a construction period for remediation activities of 7 months. As CH2M HILL's true costs for construction oversight cannot be known at this time, these costs are based on the allowances included in the Remediation Strategy reports previously submitted to the City (CH2M HILL, 2012b) and (CH2M HILL, 2012c).
- vi. It is assumed that costs can be transferred between work activities shown on the RAM based on project needs as they occur.
- vii. The time period for final review and approval of the RA and RSC by the MOE is beyond the control of CH2M HILL, and we cannot predict with a great degree of certainty the exact date when the RSC will be accepted.
- viii. It is CH2M HILL's understanding that others will assume responsibility for certain documentation required by the MOE related to the deed/land transfer; therefore, CH2M HILL is not responsible for any delays resulting from this task which may impact final RSC acceptance date.
- ix. Actual time to complete the work may vary depending on a number of factors, only some of which are directly controlled by CH2M HILL.

We will work in a collaborative manner with the City to drive additional cost efficiencies and implementation improvements at the Sydenham-Pearl Brownfield. We will continually search for ways to improve our performance and achieve a cost-effective remediation and risk assessment approach.

We do this by:

- i. Providing regular updates on regulatory changes and trends in the market place so we can make informed decisions and advise the City on the requirements for the sites. For instance, as previously noted, development of one RA instead of two may provide some cost savings.
- ii. Remedial process optimization through decision science tools and processes to optimize remedial plans.
- iii. Reductions in monitoring to identify actions that will result in the same objective being achieved but through less expensive means.
- iv. Collaborating with the City on the decision making to integrate their land re-use strategy with the risk assessment with a goal to come up with the highest economic and environmental value of the land.
- v. Using a procurement system and contract development basis to apply sound business practices to procurement activities and help the City achieve best value in acquired goods and services.
- vi. Preparing scopes of work for each task to pre-define project specific requirements, overall productivity and performance and to clearly define strategic objectives. This is then leveraged for capture of improvement opportunities and value added in cost savings, cost avoidance or new asset value.
- vii. Applying our volume discounts from our regular subcontractors to the City. Occasionally, opportunities also arise with our remedial contractors where savings can be found due to our ability to either manage the schedule of the project or leverage the overall work we are doing to pass on savings to the Client. On one project, we were able to renegotiate hazardous waste disposal rates with a waste receiver in the middle of a project that resulted in a savings of approximately \$1M.
- viii. Leveraging our familiarity with the project to jump start the next phase of risk assessment and remediation.

6.3 Project Terms and Conditions

CH2M HILL proposes to perform the services detailed herein in accordance with the same terms as set out in the duly executed Agreement dated March 14, 2012 by and between the City and CH2M HILL.





Edgar H. Taves

Project Lead

Education

M.Sc. (Biochemistry), University of Western Ontario

B.Sc., Double Honours (Chemistry and Biology), University of Waterloo

Professional Registrations

P. Geo., Limited (Ontario)

QP_{ESA} under O.Reg. 153/04

C.Chem.

Distinguishing Qualifications

- Over 21 years of professional experience in environmental consulting
- Specializes in environmental due diligence assessments (Phase I and II Environmental Site Assessments [ESAs]), site characterization, risk assessment, remedial option analysis, contaminant hydrogeology, facility decommissioning and Brownfield redevelopment, preparation of Record of Site Conditions (RSCs), regulatory compliance, site assessment plans and environmental management, waste site evaluation, site investigation and remediation, remedial planning, data analysis and interpretation, and hazardous waste management.

Relevant Experience

Ed Taves has over 21 years of professional experience in environmental consulting. He specializes in environmental due diligence assessments (Phase I and II ESAs), site characterization, risk assessment, remedial option analysis, contaminant hydrogeology, facility decommissioning and brownfield redevelopment, RSC preparation, regulatory compliance, data analysis and interpretation, and hazardous waste management. Clients have included a variety of federal and provincial departments and ministries, municipal governments, industries, as well as members of the legal, financial, accounting, and land development communities. Projects have been completed for a wide variety of contaminants including petroleum hydrocarbons (PHCs); a variety of volatile organic carbons (VOCs) including chlorinated aromatics and polynuclear aromatic hydrocarbons (PAHs); a variety of metals; polychlorinated biphenyls (PCBs); pesticides; nutrients such as phosphorus and ammonia; energetic, unexploded ordnance; chemical warfare agents, and radiologicals. He has acted in a number of roles including project manager, task manager, senior technical consultant, and public and regulatory agency liaison.

Representative Projects and Dates of Involvement

Project Lead; ESA and Preparation of Remediation Strategy; Sydenham Pearl Brownfield; City of Brantford; Brantford, Ontario; 2012. The Sydenham Pearl Brownfield consists of two parcels of land in downtown Brantford, both with industrial legacies dating back to the early 1900s. CH2M HILL was retained to conduct Phase One and Two ESAs, and to prepare a Remedial Action Strategy to revitalize the properties for potential residential development. Work included consultation with city staff, a public meeting, and presentations to City Council. Work was completed to the satisfaction of the City, the public, and City Council, and resulted in the approval of funds for implementation of the remedial strategy.

Environmental Task Manager, Senior Environmental Scientist; Former Amherstburg Manufacturing Facility, Environmental Site Assessment, Risk Assessment, Remedial Planning, Contract Administration and Demolition Oversight; Confidential Client, 2010 to Present. CH2M HILL was retained to provide environmental advisory and construction management services for the decommissioning of a large abandoned chemical manufacturing facility. Services provided have included Phase Two ESAs, Risk Assessment activities, preparation of tender documents and tendering for facility demolition and remediation services, project administration and construction oversight. Work is being conducted with regular consultation with the client, the public, and municipal and regulatory personnel. Onsite environmental activities have been coordinated with the demolition of over 300,000 ft² of

Edgar H. Taves

manufacturing space, with strict observance of health and safety protocols. Responsible for the design and implementation of intrusive field programs for the characterization of soil and groundwater quality, and for management of the completion of risk assessment activities. Intrusive field activities were coordinated with a large scale demolition project, requiring ongoing vigilance regarding the health and safety of field personnel.

Senior Environmental Scientist; West Don Lands; Ontario Infrastructure and Lands Corporation (IO); Toronto, Ontario; 2010 to Present. The largest brownfield site currently under development in Ontario, this former industrial site will encompass mixed-use residential and commercial development, as well as a substantial parkland component, after it serves as the Pan American Athletes' Village (PAAV) for the 2015 Pan/Parapan American Games (Pan Am Games). The PAAV will house over 8,000 athletes and coaching staff. This revitalization project involved an aggressive schedule to secure the environmental approvals required in advance of infrastructure and building construction by development partners. Site characterization, risk assessment (RA), remedial option feasibility studies (ROFSs), remediation, and risk mitigation measures (RMMs) are key project components. CH2M HILL Canada Limited (CH2M HILL) conducted field investigations and prepared multiple Phase One and Phase Two environmental site assessment (ESA), ROFS, and RA reports in parallel in order to meet the development schedule. The reports complied with Ontario Regulation (O. Reg.) 153/04 under the *Environmental Protection Act*, as amended by O. Reg. 511/09, such that Records of Site Condition (RSCs) will be obtained on properties prior to development. Currently, CH2M HILL is acting as the third-party Ontario Ministry of the Environment (MOE) Qualified Person (QP) to audit compliance with the Certificates of Property Use (CPUs) and RAs during the implementation of the RMMs.

In October 2011, the WDL project was selected by the Canadian Urban Institute for the **2011 Brownie Award** as the project that best demonstrated **Excellence in Project Development at the Neighbourhood Scale**. The annual Brownie Awards program recognizes leadership, innovation, and environmental sustainability in brownfield redevelopment across Canada.

Providing senior review functions for the completion of Phase I and II ESA, and risk assessment programs. The subject site includes a large block of land with a wide variety of industrial occupancy over a 150-year period. A variety of assessment methods and remedial solutions are being implemented to facilitate the intended completion of numerous RSCs for varying end land uses.

Project Manager / Senior Environmental Scientist; Environmental Advisory Services, Historical Chemicals Plant; Reichhold Inc. Facility; Brampton, Ontario; 2010 to Present. Providing environmental advisory and management services as required for the management of environmental conditions associated with a former chemicals plant. Services provided include preparation and implementation of an annual groundwater quality monitoring program, liaison with neighbouring land owners, soil gas sampling activities in support of a risk assessment program; monitoring of an ongoing phytoremediation program.

Project Manager and Senior Consultant; Environmental Assessment of Shamrock Industrial Subdivision; City of London; London, Ontario; 2007 to 2009. Project Manager for the investigation of latent environmental liabilities in association with a 5-hectare (ha) Brownfield property which was contaminated with various industrial and municipal wastes including pesticides, solvent and metals. The City of London was considering acquiring the site subsequent to a failed tax sale. Due diligence activities were completed, including detailed Phase I and II ESAs, remedial options analysis and cost estimating. Several presentations were made to municipal Council.

Project Manager; Environmental Investigation in Support of a Property Transaction; Natrel Inc.; London, Ontario; 2005 to 2007. Managed the completion of due diligence activities in support of the divestiture of a parcel of Brownfield land known to be contaminated with free phase coal gasification wastes. Managed negotiations between the vendor and the City of London. Environmental risks were successfully characterized and the property title was successfully transferred.



Brian Whiffin

Principal/Senior Advisor

Education

M.Eng., Civil Engineering, University of Ottawa (jointly with University of Waterloo)

B.A.Sc., Civil Engineering, University of Waterloo

Professional Registrations

Professional Engineer: Ontario

Relevant Experience

Brian Whiffin's career has encompassed a variety of hazard evaluation and liability management projects for chemical, biological, radioactive, and explosive risk. This has included characterization and reduction of risk/liability from environmental, waste and munitions. He has filled a number of roles including project and program management, senior technical consultant, and regulatory agency liaison.

Representative Projects and Dates of Involvement

Principal/Senior Advisor; Environmental Site Assessment (ESA) and Preparation of Remediation Strategy; Sydenham Pearl Brownfield; City of Brantford; Brantford, Ontario; 2012. The Sydenham Pearl Brownfield consists of two parcels of land in downtown Brantford, both with industrial legacies dating back to the early 1900s. CH2M HILL was retained to conduct Phase One and Two ESAs, and to prepare a Remedial Action Strategy to revitalize the properties for potential residential development. Work included consultation with city staff, a public meeting, and presentations to City Council. Work was completed to the satisfaction of the City, the public, and City Council, and resulted in the approval of funds for implementation of the remedial strategy.

Senior Consultant; Wellington Block Redevelopment; Hamilton Health Sciences; Hamilton, Ontario; 2003 to ongoing. Phase I and II ESAs, designated substance survey, risk assessment (RA) and remedial options related to acquisition/redevelopment of a former wire/nail manufacturing plant, asphalt plant, and rail lands under a failed tax sale.

Project Manager; Risk Assessment for Portlands Divestiture; Public Works and Government Services Canada (PWGSC); Port Stanley, Ontario; 2008 to Present. A Risk Assessment and supplemental investigation was completed of sediment contamination in waterlots and soil/groundwater conditions in uplands associated with the proposed divestiture of federal lands to a local municipality. The Risk Assessment was completed to federal and provincial standards leading to filing of a Record of Site Condition (RSC).

Project Manager; Deloro Mine Site Cleanup; Ontario Ministry of the Environment (MOE); Belleville, Ontario; 1997 to 2010. Rehabilitation of the Deloro Mine and Smelter site (estimated \$40M +) involving a risk-based evaluation and closure of mine wastes, smelting residues, pesticide wastes, and tailings for a facility that refined or produced gold, cobalt, silver, stellite, and arsenic since the late 1800s. Low-level radioactive residues are present on the site from re-processing of by-products from Eldorado Nuclear in Port Hope, Ontario. CH2M HILL is leading the Federal Environmental Assessment (EA) and Licensing Application to fulfill Canadian Nuclear Safety Commission (CNSC) requirements.

Principal/Senior Engineer, Regional Individual Standing Offer (RISO) for Environmental Site Assessments in Ontario, 2010 to date. Coordinated a multi-disciplinary team for a suite of call-ups for Phase One and Two ESAs, sediment investigations, risk assessments, remediation options evaluations at federal sites across Ontario. Provided senior engineering/consulting expertise and acted as the main point of contact with PWGSC for project performance.

Project Manager/Senior Engineer; Standing Offer for UXO, Environmental, and Cultural Resources Investigations; DCC; Former Camp Ipperwash, Ontario; 2010 to Present. Lead a multidisciplinary team

Brian Whiffin

conducting a suite of services UXO and, environmental and cultural investigations to quantify DND's legacy from previous military training exercises.

Project Manager/Senior Consultant; Several Demolition/Dismantling, Decommissioning, Waste Management and Infrastructure Renewal Projects; Atomic Energy of Canada Ltd (AECL); Chalk River, Ontario; 2004 to 2008.

Projects include: (i) B-204 Dismantling and Demolition, (ii) Conceptual Options Evaluation for new fuel bays at the National Research Universal (NRU) reactor; (iii) Pathway Analysis for Bulk Materials Landfill; (iv) Conceptual Design for a Non-Active Landfill; (v) Sediment Remediation Feasibility Study. Also acted as the Client Service Manager and conducted the senior review on the Stored Liquid Wastes Management Project at Chalk River.

Senior Regulatory Advisor/Senior Engineer; Faro Mine Complex Remediation and Closure Planning (FMRP)

Project; Government of Yukon (YG); Faro, Yukon; 2012 to Ongoing. CH2M HILL is supporting the Government of Yukon, Assessment and Abandoned Mines Branch as the Project Design Team for the FMRP. In this role, CH2M HILL is providing engineering and regulatory technical services, as well as management and planning support. The scope of these services includes all facets of site assessment, remediation, and closure; environment and socio-economic assessment; and regulator permitting as needed. Work performed includes hydrogeology, geochemistry, geotechnical engineering, hydrogeology, hydrology, biophysical assessment, and water treatment. The project poses unique challenges in its size and complexity, requiring building a team of multidisciplinary subject matter experts from across North America, and in its remoteness, which increases the level of rigour required to plan and execute the work. The two project clients, YG, and Aboriginal Affairs and Northern Development Canada (AANDC), have recognized that the Faro Mine Complex remediation and closure is a top priority among environmental work in the Yukon and Canada; as such, CH2M HILL is providing timely, technical, and strategic advice to achieve successful delivery. Acted as senior regulatory reviewer and advisor to develop the regulatory approvals strategy, complete stakeholder consultation and prepare a project proposal for a \$500M capital waste management/remediation project.

Senior Project Advisor; Huron Campus Remediation; Algonquin College; Ottawa, Ontario; 1988 to 2000. The development of a remediation strategy, investigation and subsequent \$800K remediation of a former bulk petroleum facility in Ottawa. Site cleanup was conducted in accordance with the MOE's 1997 guideline and lead to the issuance of an RSC.

Project Manager; Former Imico Foundry Property Use Study; City of Guelph; Guelph, Ontario; 2003 to 2004.

CH2M HILL is leading a multi-faceted team to assist the City of Guelph in identifying viable options for redevelopment of this Brownfield site through consideration of market demand, planning considerations, infrastructure conditions and environmental constraints. The study will lead to a recommended redevelopment option for the site.

Senior Advisor Peer Review; Community Based Risk Assessment (CBRA), ERA; City of Port Colborne; Port Colborne, Ontario; 2003. Peer review of a comprehensive project to assess the level of risk related to atmospheric deposition of metal-containing precipitates, primarily nickel, on the natural environment.

Environmental Remediation Advisor; Harbourfront Revitalization Strategy and Secondary Plan; City of Port Colborne; Port Colborne, Ontario; 2004 to 2004. Part of a multi-disciplinary team formed to develop a revitalization strategy for redevelopment of lands impacted by smelter emissions and previous industrial use.

Project Manager/Remediation Specialist; Toronto Waterfront: Portlands Preparation; Toronto Waterfront Revitalization Corporation (TWRC); Toronto Ontario; 2002 to 2005. \$60M in seed funding was allocated by three levels of government to provide the necessary infrastructure and environmental remediation needed to attract private sector development to Toronto's waterfront. The subject lands comprise 1,000 acres of under-utilized real estate in the Port Lands and WDL bordering on the waterfront. The Corporation prepared a business plan and development plan, and is leading implementation over the next 20 years.

Senior Consultant; Environmental Monitoring of the Meaford Tank Range; Meaford, Ontario; PWGSC; 2007 to 2008. Senior technical review of environmental monitoring, interpretation, and reporting.



James G. Sprenger

Principal/Senior Advisor

Education

B.Sc., Biochemistry, University of Waterloo

M.Sc. (Candidate), Occupational and Environmental Health, University of Toronto

Distinguishing Qualifications

- Extensive experience conducting human health and environmental risk assessment supporting remediation and property redevelopment
- Experience assessing metals, inorganics, volatile organics, petroleum hydrocarbons, semi-volatile organics, and some pesticides
- Extensive experience conducting environmental compliance audits for a variety of clients
- Qualified Person for Risk Assessment (QPRA) (Ontario Regulation [O.Reg] 153/04, via Ontario Ministry of the Environment [MOE])

Relevant Experience

James Sprenger has more than 20 years of experience in environmental consulting, including 18 years of human health risk assessment (HHRA) of contaminated sites, and 12 years of environmental compliance auditing. He has managed environmental site investigations and human health risk assessments (HHRA) related to environmental projects, contaminated site decommissioning, and site assessment. He also has experience with industrial and mine closure projects, providing industrial hygiene support and consultation. He has developed toxicological exposure models and databases for HHRAs. James has experience with Canadian (Canadian Council of Ministers of the Environment [CCME], Ontario, British Columbia, Alberta, Quebec, and Atlantic provinces) and United States frameworks for risk assessment (New York, New Hampshire, Massachusetts) including U.S. Environmental Protection Agency Superfund and American Society of Testing and Materials (ASTM) risk-based corrective action tiered framework. He has completed numerous probabilistic assessments and deterministic risk assessments (RA). James has experience in applying risk assessment to hydrogeological problems, including the use of hydrogeological pathways into exposure assessment models. He also has experience using risk-based hydrogeological screening models to understand contaminant degradation, dispersion, and advection.

James was accepted as a QPRA by the MOE in December 2004, having prepared more than five pre-submission forms (PSF) and contributed to many others. His current project portfolio includes eight RAs with human and ecological aspects, as well as providing RA review, advice, and support for industrial site closure and Toronto waterfront initiatives.

Representative Projects and Dates of Involvement

Risk Management Measures; Environmental Site Assessment (ESA) and Preparation of Remediation Strategy; Sydenham Pearl Brownfield; City of Brantford; Brantford, Ontario; 2012. The Sydenham Pearl Brownfield consists of two parcels of land in downtown Brantford, both with industrial legacies dating back to the early 1900s. CH2M HILL was retained to conduct Phase One and Two ESAs, and to prepare a Remedial Action Strategy to revitalize the properties for potential residential development. Work included consultation with city staff, a public meeting, and presentations to City Council. Work was completed to the satisfaction of the City, the public, and City Council, and resulted in the approval of funds for implementation of the remedial strategy.

Environmental Manager/Senior RA Advisor; Former Amherstburg Manufacturing Facility, Environmental Site Assessment, Risk Assessment, Remedial Planning, Contract Administration and Demolition Oversight; Confidential Client, 2010 to Present. CH2M HILL was retained to provide environmental advisory and construction management services for the decommissioning of a large abandoned chemical manufacturing facility. Services provided have included Phase Two ESAs, Risk Assessment activities, preparation of tender documents and tendering for facility demolition and remediation services, project administration and construction oversight. Work is being conducted with regular consultation with the client, the public, and

James G. Sprenger

municipal and regulatory personnel. Onsite environmental activities have been coordinated with the demolition of over 300,000 square feet of manufacturing space, with strict observance of health and safety protocols.

Senior Risk Assessor; Quantitative RA of Chemicals in Soil and Groundwater at Former Industrial Facility; Hamilton Health Sciences; Hamilton, Ontario; 2004 to 2007. Conducted risk assessment screening and provided input into field investigations to support RAs. Completed and submitted a MOE pre-submission form and performed a quantitative HHRA of chemicals detected in soil and groundwater. The RA was completed under O. Reg. 153/04 framework.

Lead Risk Assessor; West Don Lands; Ontario Infrastructure and Lands Corporation (IO); Toronto, Ontario; 2010 to Present. The largest brownfield site currently under development in Ontario, this former industrial site will encompass mixed-use residential and commercial development, as well as a substantial parkland component, after it serves as the Pan American Athletes' Village (PAAV) for the 2015 Pan/Parapan American Games (Pan Am Games). The PAAV will house over 8,000 athletes and coaching staff. This revitalization project involved an aggressive schedule to secure the environmental approvals required in advance of infrastructure and building construction by development partners. Site characterization, risk assessment (RA), remedial option feasibility studies (ROFSs), remediation, and risk mitigation measures (RMMs) are key project components. CH2M HILL Canada Limited (CH2M HILL) conducted field investigations and prepared multiple Phase One and Phase Two environmental site assessment (ESA), ROFS, and RA reports in parallel in order to meet the development schedule. The reports complied with Ontario Regulation (O. Reg.) 153/04 under the *Environmental Protection Act*, as amended by O. Reg. 511/09, such that Records of Site Condition (RSCs) will be obtained on properties prior to development. Currently, CH2M HILL is acting as the third-party Ontario Ministry of the Environment (MOE) Qualified Person (QP) to audit compliance with the Certificates of Property Use (CPUs) and RAs during the implementation of the RMMs.

In October 2011, the WDL project was selected by the Canadian Urban Institute for the **2011 Brownie Award** as the project that best demonstrated ***Excellence in Project Development at the Neighbourhood Scale***. The annual Brownie Awards program recognizes leadership, innovation, and environmental sustainability in brownfield redevelopment across Canada.

As the Human Health Risk Assessment (HHRA) Lead for the WDL project, responsible for coordinating the completion of eight RA reports. To ensure the HHRA components of the reports are completed according to the accelerated schedule, coordinates a team of 20 HHRA staff, and has engaged multiple stakeholders on numerous technical issues. In addition, serves as the key RA contact for the ecological risk assessment (ERA), ESA, and Risk Management teams, liaising with these teams to ensure the concurrent development of multiple sections of the reports does not jeopardize report quality and harmonization.

Senior Risk Assessor; RA and RMP for Port Stanley Harbour; Public Works and Government Services Canada (PWGSC); March 2009 to Present. Currently completing a multimedia RA (sediment, surface water, groundwater and sediment). Tasks to date include providing direction and review of all aspects of the PSF for the MOE submittal. A QA/QC for the RA will be completed to facilitate the filing of a record of site condition (RSC).

Senior Risk Assessor; RA and RMP for Don Valley Brickworks; City of Toronto, Ontario; September 2006 to January 2009. As senior risk assessor and QPRA for an RA at a former brick manufacturing property, guided staff on RA approach and reporting, development of risk management measures and review of the risk assessment report. Reviewed construction documents to ensure risk management measures were implemented. The MOE acknowledged the RA.

Peer-Review; Brownfields RA for Interim Sport Fields; Waterfront Toronto; January 2006 to 2008. Provided a review of HHRA and ecological risk assessment (ERA) of chemicals in soils and groundwater detected at a property on the Toronto Waterfront.

Review of Brownfields RA for West Don Lands; TWRC; January 2006 to 2008. Reviewed human health and ecological RAs of chemicals in soils and groundwater detected at a 200+-hectare property on the Toronto Waterfront.

James G. Sprenger

Senior Risk Assessor; Risk Assessment at Former Epton Facility; PolyOne Canada Inc., Kitchener, Ontario; February 2007 to Present. Provided senior review, quality assurance/quality control (QA/QC) and input for the development of the RMP for an RA at an industrial site. Parcel 1 RA was acknowledged by the MOE; RAs for additional parcels are being considered.

Senior Risk Assessor; Pre- and Post-Closure Risk Assessments; Ontario Ministry of the Environment; Deloro, Ontario; 2005 to 2009. Provided senior review and guidance to staff for the preparation of the pre- and post-closure RAs for the Deloro Mine Site.



Kurt Hansen

Qualified Person, Environmental Site Assessment

Education

M.E.S., Master of Environmental Studies, University of Waterloo

B.E.S., Honours Geography, University of Waterloo

General Arts Program, Academy of the New Church College

Professional Registrations

Professional Geoscientist: Ontario

Relevant Experience

Kurt has over 22 years' experience in Phase One, Two, and Three environmental site assessments (ESAs), environmental audits, site remediation programs, and field investigations involving soil and groundwater sampling and monitoring. He is experienced in project development and implementation, including project planning and management, site investigation, design and implementation, client/regulatory agency liaison, data analysis and interpretation, and technical reporting. Kurt is designated as a Qualified Person for Environmental Site Assessment (QP_{ESA}) by the Ontario Ministry of the Environment (MOE).

Representative Projects

Qualified Person; ESA and Preparation of Remediation Strategy; Sydenham Pearl Brownfield; City of Brantford; Brantford, Ontario; 2012. The Sydenham Pearl Brownfield consists of two parcels of land in downtown Brantford, both with industrial legacies dating back to the early 1900s. CH2M HILL was retained to conduct Phase One and Two ESAs, and to prepare a Remedial Action Strategy to revitalize the properties for potential residential development. Work included consultation with city staff, a public meeting, and presentations to City Council. Work was completed to the satisfaction of the City, the public, and City Council, and resulted in the approval of funds for implementation of the remedial strategy.

Site Assessment Lead – QP_{ESA}; West Don Lands (WDL); Ontario Infrastructure and Lands Corporation (IO); Toronto, Ontario. The largest brownfield site currently under development in Ontario, this former industrial site will encompass mixed-use residential and commercial development, as well as a substantial parkland component, after it serves as the Pan American Athletes' Village (PAAV) for the 2015 Pan/Parapan American Games (Pan Am Games). The PAAV will house over 8,000 athletes and coaching staff. This revitalization project involved an aggressive schedule to secure the environmental approvals required in advance of infrastructure and building construction by development partners. Site characterization, risk assessment (RA), remedial option feasibility studies (ROFSs), remediation, and risk mitigation measures (RMMs) are key project components. CH2M HILL Canada Limited (CH2M HILL) conducted field investigations and prepared multiple Phase One and Phase Two ESAs, ROFSs, and RA reports in parallel in order to meet the development schedule. The reports complied with Ontario Regulation (O. Reg.) 153/04 under the *Environmental Protection Act*, as amended by O. Reg. 511/09, such that Records of Site Condition (RSCs) will be obtained on properties prior to development. Currently, CH2M HILL is acting as the third-party MOE-Qualified Person (QP) to audit compliance with the Certificates of Property Use (CPUs) and RAs during the implementation of the RMMs.

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As QP_{ESA} for the WDL project, Kurt managed and directed field investigations and prepared four Phase One reports and six Phase Two ESA reports for 60 blocks of the 36-ha WDL under an accelerated schedule. The ESA team supervised by Kurt evaluated data at approximately 290 areas of potential environmental concern (APECs) identified through the Phase One ESAs and over 500 sample locations across the site (including more than 290 monitoring wells). Data generated was used to build a conceptual site model (CSM) for each RSC Property to comply with post July 1, 2011 regulatory requirements. As QP_{ESA}, Kurt led the ESA reporting and the associated site assessment

Kurt Hansen

summaries that were included in the RA Reports, liaised with the MOE to integrate current requirements into the ESA reports and RSC documents, was responsible for the completion of the 13 acknowledged RSCs to date, served as technical liaison with the RA and ROFD teams to realize efficiencies and certified that the remediation strategy was implemented. Through this, his expertise in developing and implementing site remediation work for the purposes of obtaining an RSC(s) with the MOE is clear. Two of the acknowledged RSCs were under O. Reg. 153/04 (before July 1, 2011) and 11 were under O. Reg. 153/04 as amended by 511/ (after July 1, 2011).

Site Assessment Lead Phase I ESA and Senior Technical Advisor; Wellington Development Block Brownfield Redevelopment; Hamilton Health Sciences; Hamilton, Ontario; 2004 – 2007.

Project activities involved the completion of Phase I and Phase II ESAs, a designated substance and building waste survey, risk assessment, and a remedial action plan on the Wellington Development Block located immediately west of Hamilton General Hospital (HGH), in support of plans for the potential acquisition of the site from the City of Hamilton. CH2M HILL prepared all demolition and remediation specifications for this project and managed the abatement, demolition, remediation and restoration work. CH2M HILL also assisted in redevelopment options for the various parcels of land that make up the larger property.

As senior ESA lead, served as site assessment lead for completion of Phase I activities which included a site history review, site inspections, interviews, an evaluation of information and reporting. The Phase I environmental site assessment concluded that the Block has the potential for soil and groundwater contamination, with 19 potential areas of concern noted, including metals, PCBs, asbestos-containing materials, gasoline, diesel, and USTs. Subsequently, provided senior technical guidance and support to subsequent phases of the project as required.

Project Manager; Updated ESA, Sediment Sampling, and Remedial Action Plan and QP_{ESA} for subsequent ESA Update and RA; Public Works and Government Services Canada (PWGSC); Port Stanley Harbour, Ontario. Issues include contaminated harbour sediments, soil, and groundwater (petroleum hydrocarbons [PHCs], heavy metals, polycyclic aromatic hydrocarbons [PAHs], ammonia, and nitrate). Site strategy involves RA in conjunction with remedial action (including phytoremediation, *in situ* bioremediation, and excavate/dispose) to address “hot spot” contamination areas; remediation criteria established during RA will be used to set remediation criteria and guide remediation efforts. The Harbour is a multi-tenant site with industrial/commercial activities including fuel/hazardous material handling/storage and vehicle maintenance. Complex environmental issues exist at the site: leaking fuel storage tanks/pipelines and the improper storage/handling and spills of hazardous materials; and multiple contaminant types (PHC, heavy metals, PAHs) are present. The federally owned and operated site is considered “environmentally sensitive” due to its proximity to Lake Erie; a risk-based (as opposed to remediation-based) approach is the desired long-term management strategy for the site. In 2008, as QP_{ESA}, worked with the technical team to develop a data gap evaluation and supplemental investigation plan which were completed to address provincial regulatory requirements for filing an RSC imposed as part of the transfer of lands to the municipality. In 2010, supported the public consultation program and represented the client at the information sessions. As a result of regulatory changes coming into force in mid-2011, and continue serve as QP_{ESA} for a Phase Two to address the new regulatory requirements for completion of the RA and filing of RSCs on four distinct properties.

Project Manager; Environmental Due Diligence Review; Toronto Community Housing Corporation (TCHC); King & Adelaide Sts, Toronto, Ontario; 2007. Conducted an environmental due diligence review and updated Phase I and II ESA at 288 King Street East and 501 Adelaide Street East in Toronto, Ontario. Activities at the King and Adelaide Streets Site included an environmental due diligence review and updated Phase I and II ESA. Based on the ESAs’ findings, estimated the volume of subsurface materials that could require future management and provided various cost-effective management approaches, alongside opinions of probable implementation costs. Subsequently, supervised and documented environmental remediation activities to address the ESAs’ findings. Once remedial activities were complete, filed an RSC under the MOE’s O. Reg. 153/04, documenting the actions required to facilitate the site’s redevelopment, given its more sensitive land use.

CH2M HILL has completed a number of successful ESAs and remediation projects for TCHC, including their developments at 288 King Street East and 501 Adelaide Street East in Toronto, Ontario and the Don Mount Court Redevelopment Project, also located in Toronto. **Project Manager; Phase I ESA of Cherry Beach; Waterfront Toronto; Toronto, Ontario.** The purpose of the Phase I ESA was to review the site history and identify if potential issues of environmental concern exist at the subject site that may warrant further investigation, and to assist in

scoping an appropriate Phase II ESA if warranted. The Phase I ESA was completed in general accordance with CSA Standard Z768-01 so that it could be used, if required, in conjunction with other future Phase II ESA and Remedial or Risk Assessment work to file an RSC under O. Reg. 153/04. Key project activities included background information review, site visit, interviews, and reporting.



Meggen Janes

Communications Lead, Risk Management Measures, and Remedial Strategy Review

Education

M.S., Environmental Engineering, University of Guelph, Ontario

B.A.S., Geological Engineering (Geotechnical option), University of Toronto, Ontario

Professional Registrations

Professional Engineer: Ontario (1997)

Project Management Professional, 2005)

Relevant Experience

Meggen Janes has over 18 years of experience in environmental consulting, with key expertise based on innovative and emerging technology applications. She has conducted research and development on new and emerging technologies through bench and pilot studies and she has completed and managed property assessments, peer reviews, compliance and environmental management systems evaluations, risk assessments, and contaminant investigation and remediation projects at a number of public and private sector properties.

Meggen completes needs analysis for clients and evaluates requirements within the context of provincial policies/programs and procedural framework, determining delivery options. She has applied innovative strategies to deal with site restoration and closure by using a combination of techniques including excavation with underpinning and sheet piling, in-situ chemical oxidation, in-situ and ex-situ bioremediation, soil vapour extraction, passive groundwater collectors, pump and treat and multi-phase vacuum extraction. As an extension of in-situ environmental restoration, Meggen has designed vapour and groundwater treatment facilities for the above-ground treatment of contaminated material prior to discharge to the environment. She has also prepared startup commissioning plans, and operation and maintenance manuals, for remediation systems, overseeing operation and performance related to ongoing remediation systems.

Representative Projects and Dates of Involvement

Communications Lead; Environmental Site Assessment (ESA) and Preparation of Remediation Strategy; Sydenham Pearl Brownfield; City of Brantford; Brantford, Ontario; 2012. The Sydenham Pearl Brownfield consists of two parcels of land in downtown Brantford, both with industrial legacies dating back to the early 1900s. CH2M HILL was retained to conduct Phase One and Two ESAs, and to prepare a Remedial Action Strategy to revitalize the properties for potential residential development. Work included consultation with city staff, a public meeting, and presentations to City Council. Work was completed to the satisfaction of the City, the public, and City Council, and resulted in the approval of funds for implementation of the remedial strategy.

Communications Lead; West Don Lands; Ontario Infrastructure and Lands Corporation (IO); Toronto, Ontario; 2010 to Present. The largest brownfield site currently under development in Ontario, this former industrial site will encompass mixed-use residential and commercial development, as well as a substantial parkland component. The immediate development plan is for the majority of the site to become home to the Athletes' Village for the 2015 Pan/Parapan American Games. This revitalization project involves an aggressive schedule to secure the environmental approvals required in advance of infrastructure and building construction by development partners. Site characterization, risk assessment (RA), remedial option feasibility studies (ROFSs), remediation, and risk mitigation measures (RMMs) are key project components. CH2M HILL is conducting field investigations and preparing multiple Phase One and Phase Two environmental site assessment (ESA), ROFS, and RA reports in parallel in order to meet the schedule. The reports will comply with Ontario Regulation (O. Reg.) 153/04 under the *Environmental Protection Act*, as amended by O. Reg. 511/09, such that Record of Site Conditions (RSCs) will be obtained on properties prior to development.

In October 2011, the WDL project was selected by the Canadian Urban Institute for the **2011 Brownie Award** as the project that best demonstrated **Excellence in Project Development at the Neighbourhood Scale**. The annual

Meggen Janes

Brownie Awards program recognizes leadership, innovation, and environmental sustainability in brownfield redevelopment across Canada.

As Communications lead, works with the CH2M HILL project team, IO, and related stakeholders (City of Toronto, MOE, other government agencies, private developers, and the public) to facilitate remediation and approvals strategies. Also ensures effective stakeholder and public communications to inform and achieve alignment with project goals.

Project Manager; Sportsfield Site; Waterfront Toronto; Toronto, Ontario; 2006 to 2008. Project Manager/QP ESA for multi-stakeholder project for the development and construction of two artificial sportsfields on Toronto's waterfront; an environmental baseline study was completed to support an RA that incorporated risk management measures and long term monitoring; the RA was compliant with O. Reg. 153/04 and accepted by the MOE; stakeholder involvement was extensive through the process and approval of the remediation process from stakeholders and MOE was obtained; an RSC was filed for the property in summer 2008.

Project Manager/Director; Community Waterfront Park Environmental Remediation; City of North Bay; North Bay, Ontario, 2004. Project Manager/Director for cleanup of approximately 4,000 m³ of petroleum hydrocarbon-impacted soil at a waterfront redevelopment site; supervised soil remediation and managed an extensive assessment of both groundwater flow and the distribution of contaminants; upgradient chlorinated solvent contamination was identified during the work and a separate investigation was completed. The remediation work was conducted under an accelerated time frame to meet the development schedule. The soil remediation program was completed successfully and the groundwater contaminants and extent of impact was characterized to assist in development and associated RA.

Project Manager; Pottersburg PCB Decommissioning Project; Ontario Ministry of the Environment (MOE); Ontario; Ongoing. The engineering scope of this project included the development of the environmental plans to safeguard the public and the natural environment during the removal of over 80,000 tonnes of PCB waste material from four separate vaults. CH2M HILL then conducted the delivery of the various monitoring plans and acted as consultant to the prime contractor during the confirmatory and Phase II sampling phases that lead to remedial action plans for unknown conditions. CH2M HILL fees totaled over \$4M.

Project Manager; Phase I ESA; Ontario Realty Corporation; 2005 to 2007. Managed Phase I ESA/Category B EA programs conducted on several properties – one of which was the Milton County Heritage Park consisting of 69 buildings on an 80-acre property.

Project Manager; Phase I/II Environmental Site Assessments; Multiple Sites, City of Greater Sudbury, Ontario; 2003 to 2004. Project Manager for Phase I and II environmental site assessments and designated substance surveys on City properties to provide input into redevelopment options.

Project Manager; Phase II ESA; Canadian National; Sault Ste. Marie, Ontario; 2004. Project Manager for investigation of soil and groundwater, hazardous materials, and designated substances at a property with multiple areas of concern and an ongoing remediation system.

Project Manager; Phase II ESA (multiple sites) and Groundwater Monitoring Program; Hydro One Network Services Inc.; 2000 to 2003. Project Manager for the investigation of soil and groundwater at multiple sites, which included the evaluation of hydrogeological data to assess potential sources from areas upgradient to a site.

Project Director: Shopping Plaza Remediation; Morguard Investments Limited; GTA, Ontario; 2007 to 2008. Project Director for development of a remedial program and implementation strategies for remediating during plaza redevelopment; a site conceptual model was developed which contemplated the impact of shallow bedrock and other migration pathways; site contaminants included both DNAPL and LNAPL, chlorinated solvent, and PHCs; the remediation strategy included in-situ reductive dechlorination for residual impacts and source removal excavation; the strategy was planned to seamlessly integrate with development activities and has been accepted by the development team; implementation was underway in summer 2008.



Dirk B. Scheurlen

Site Assessment Lead/Remediation Specialist

Education

Terrain Geology Technician Diploma, Sir Sandford Fleming College, 1989

Professional Registrations

Ontario Association of Certified Engineering Technicians and Technologists (OACETT)

Distinguishing Qualifications

- Over 23 years of experience in environmental site assessment and remediation
- Expertise in soil and groundwater remediation

Relevant Experience

Dirk Scheurlen has more than 23 years' experience conducting environmental site assessments, remediation, free product recovery and demolition. His experience includes designing and operating site remediation systems, development of contract documents, contractor management, dispute resolution, reporting and project management.

Representative Projects and Dates of Involvement

Site Assessment Lead; Environmental Site Assessment (ESA) and Preparation of Remediation Strategy; Sydenham Pearl Brownfield; City of Brantford; Brantford, Ontario; 2012. The Sydenham Pearl Brownfield consists of two parcels of land in downtown Brantford, both with industrial legacies dating back to the early 1900s. CH2M HILL was retained to conduct Phase One and Two ESAs, and to prepare a Remedial Action Strategy to revitalize the properties for potential residential development. Mr. Scheurlen was responsible for the development and implementation of the Phase Two sampling and analysis plan and standard operating procedures for the intrusive investigation.

Project Manager; Groundwater Treatment System Operation, Maintenance and Monitoring; Budcan Holdings Inc; Erin, Ontario; 2012 to Present. Project Manager for the operation, maintenance and groundwater monitoring for an air stripping groundwater containment and treatment system to ensure compliance with an Ontario Ministry of the Environment (MOE) Certificate of Approval (CofA). The groundwater treatment system is being operated to contain groundwater impacted with trichloroethylene (TCE) to prevent offsite migration in a municipality using groundwater as a drinking water source.

Project Manager; Groundwater Remediation of TCE Plume, PolyOne Corporation; Kitchener, Ontario; 2012 to Present. Project Manager responsible for the remediation of a TCE groundwater plume involving biostimulation with emulsified vegetable oil and bioaugmentation with dehalococcoides (DHC microbes) to enhance the anaerobic reductive dechlorination process at the site to facilitate degradation of TCE to non-toxic byproducts in accordance with an MOE CofA.

Project Manager; Wellington Development Block Brownfield Project; Hamilton Heath Sciences; Hamilton, Ontario; January 2004 to 2007. This project was completed under an extremely compressed schedule so that HHS could make a determination on the purchase of the Wellington Block from the City of Hamilton. The project involved the completion of a Phase I ESA, Phase II ESA, Building Waste and Designated Substance Survey and a Remedial Action Plan (RAP) and remedial cost estimate. A Ministry of the Environment approved Risk Assessment (RA) was developed to remediate the site to property specific standards prior to the filing of a Record of Site Condition (RSC). The Wellington Development Block project was the winner of the 2009 Canadian Urban Institute Brownfield (Brownie) Award in the Category of Financing, Risk Management and Partnerships.

Field Team Coordinator; West Don Lands; Ontario Infrastructure and Lands Corporation (IO); Toronto, Ontario; 2010 to Present. The largest brownfield site currently under development in Ontario, this former industrial site will encompass mixed-use residential and commercial development, as well as a substantial parkland component.

Dirk B. Scheurlen

The immediate development plan is for the majority of the site to become home to the Athletes' Village for the 2015 Pan/Parapan American Games. This revitalization project involves an aggressive schedule to secure the environmental approvals required in advance of infrastructure and building construction by development partners. Site characterization, risk assessment (RA), remedial option feasibility studies (ROFSs), remediation, and risk mitigation measures (RMMs) are key project components. CH2M HILL is conducting field investigations and preparing multiple Phase One and Phase Two environmental site assessment (ESA), ROFS, and RA reports in parallel in order to meet the schedule. The reports will comply with Ontario Regulation (O. Reg.) 153/04 under the *Environmental Protection Act*, as amended by O. Reg. 511/09, such that RSCs will be obtained on properties prior to development.

In October 2011, the WDL project was selected by the Canadian Urban Institute for the **2011 Brownie Award** as the project that best demonstrated ***Excellence in Project Development at the Neighbourhood Scale***. The annual Brownie Awards program recognizes leadership, innovation, and environmental sustainability in brownfield redevelopment across Canada.

As Field Team Coordinator, coordinated multiple field teams leading to MOE acceptance of Phase Two documentation and acknowledgement of 8 RSCs. As a senior ESA team member, responsible for coordinating and providing technical support for the preparation of 5 Phase One ESA reports, 8 Phase Two ESA reports (including 8 additional investigation/remediation reports), 2 preliminary Phase Two summary memos, and 13 RSCs for the 63-Block WDL. The accelerated schedule and multiple stakeholder input characterizing Phase Two ESA reports have required us to implement best practices and templates that facilitate schedule and quality compliance. The ESA team evaluated data at approximately 195 areas of potential environmental concern (APECs) and 1,933 sample locations across the site. Data generated were being used to build the conceptual site model (CSM) for each Phase Two grouping of Blocks, to feed information into eight RA reports, and to develop the CSMs for supporting the filing of RSCs for the properties.

Project Task Manager; Pottersburg PCB Waste Storage Site Remediation; London Ontario; Ministry of the Environment; 2009 to Present. Responsible for project Health and Safety, contract change orders, data management, procurement and portions of the Phase II ESA investigation.

Project Manager; Phase I & II ESAs and UST Decommissioning at sites throughout Southern Ontario and Quebec for Ryder Truck Rental; 2007 to 2009. The projects involved the completion of Phase I & II Environmental Site Assessments (ESAs) for Ryder Truck Rental facilities prior to property transfers/acquisitions. Conducted environmental investigations and remediation related to the decommissioning of USTs containing gasoline and diesel fuel at Ryder Truck Rental facilities located in southwestern Ontario.

Project Manager; Site Remediation, 237 Barton Street East; Hamilton Health Sciences (HHS), Hamilton, Ontario; June 2006 to 2007. The project involved soil remediation of the former Stelco Wire and Nail Works East Plant prior to the redevelopment and expansion of the Hamilton General Hospital on the property. Responsibilities included preparing contract documents, contract administration and oversight of the remediation contractor. 31,000 tonnes of contaminated soil was removed from the property and sent to Ministry of the Environment (MOE) licensed landfills. Following soil remediation, Record of Site Conditions (RSC) were filed for the properties.

Project Manager; Risk Characterization and Remediation; NOVA Chemicals (Canada) Ltd.; Cambridge, Ontario; 2000 to 2007. Responsible for the operation of a groundwater collection and treatment system and groundwater monitoring programs. Pilot testing, full-scale design, construction, and operation of an air sparging (AS) and soil vapour extraction (SVE) remediation system. The AS and SVE remediation program was conducted in combination with a RA in which site-specific remediation criteria were developed to remediate the site prior to the filing of a RSC and transfer of the property.

Task Manager; Free Product Recovery; PolyOne; Kitchener, Ontario; 2000 to 2006. Design, construction, subcontractor management and operation of a full-scale SVE system at the former Epton rubber and plastics manufacturing facility. The SVE system recovered over 28,000 litres of free phase naphtha from the water table.

Following a multiphase extraction pilot test it was determined that soil vapour was the most predominant extraction pathway primarily due to the volatility of naphtha.

Project Manager; Demolition of Former Stelco Works, 325 Wellington Street North; HHS, Hamilton, Ontario; 2005. The project involved the demolition of the 14,000 m² Stelco Wire and Nail Works West Plant. Responsible for preparing contract documents, contract administration and oversight of the demolition contractor during demolition and abatement of designated and hazardous substances. The demolition was completed on budget and ahead of schedule.

Project Manager; Free Product Remediation; City of Hamilton/HHS; Hamilton, Ontario; 2005. The project involved the excavation and disposal of free product containing soil and the skimming of free product from the excavation water table at a former City works yard located at 344 Ferguson Ave. North. A total of 1,200 tonnes of free product containing soil and 138,000 L of free product and groundwater were extracted from the subsurface and sent offsite for disposal.



Krista L. Barfoot

Risk Assessor / Brownfield Redevelopment

Education

Ph.D. (Soil Science), University of Guelph, Ontario

M.Sc. (Analytical Environmental Chemistry), McMaster University, Ontario

B.Sc. Honours (Environmental Chemistry), Queen's University, Ontario

Distinguishing Qualifications

- Extensive experience conducting human health risk assessments (HHRAs) and vapour intrusion (VI) assessments on contaminated properties in Canada and the United States, following provincial, state, and federal guidance
- Experience providing chemical, toxicological, pedological, agrological, and environmental support for various projects in North America, South America, and the United Kingdom (UK)
- Qualified Person for Risk Assessment (QP_{RA}) (Ontario Regulation [O.Reg.] 153/04, via Ontario Ministry of the Environment [MOE])

Relevant Experience

Krista Barfoot is a risk assessment scientist with over 13 years of experience in environmental science investigations, including over 6 years of experience in risk assessment (RA) and (VI) assessment. She possesses the relevant qualifications for eligibility as a QP_{RA} under O. Reg. 153/04 of the *Environmental Protection Act* for a Record of Site Condition (RSC), and is registered as such with the MOE.

Dr. Barfoot has examined aspects of both drinking water and groundwater contamination, industrial air contamination, and soil quality degradation, and has investigative experience in all three environmental mediums (water, air, and soil). Dr. Barfoot's graduate studies and work have spanned the fields of chemistry, toxicology, pedology, geology, agrology and ecology. She has completed a number of RAs and VI assessments both in Ontario and across the United States, and has provided consulting services in the fields of agriculture and soil science. Dr. Barfoot is part of CH2M HILL's Environmental Services Group, and is based in the Kitchener-Waterloo office.

Representative Projects and Dates of Involvement

Senior Technical Support; Former Amherstburg Manufacturing Facility, Environmental Site Assessment, Risk Assessment, Remedial Planning, Contract Administration and Demolition Oversight; Confidential Client, 2010 to Present. CH2M HILL was retained to provide environmental advisory and construction management services for the decommissioning of a large abandoned chemical manufacturing facility. Services provided have included Phase Two ESAs, Risk Assessment activities, preparation of tender documents and tendering for facility demolition and remediation services, project administration and construction oversight. Work is being conducted with regular consultation with the client, the public, and municipal and regulatory personnel. Onsite environmental activities have been coordinated with the demolition of over 300,000 ft² of manufacturing space, with strict observance of health and safety protocols. Provided senior technical support for risk assessment activities and participated in strategic project planning.

Human Health RA; Environmental Site Assessment (ESA) and Preparation of Remediation Strategy; Sydenham Pearl Brownfield; City of Brantford; Brantford, Ontario; 2012. The Sydenham Pearl Brownfield consists of two parcels of land in downtown Brantford, both with industrial legacies dating back to the early 1900s. CH2M HILL was retained to conduct Phase One and Two ESAs, and to prepare a Remedial Action Strategy to revitalize the properties for potential residential development. Work included consultation with city staff, a public meeting, and presentations to City Council. Work was completed to the satisfaction of the City, the public, and City Council, and resulted in the approval of funds for implementation of the remedial strategy.

Krista L. Barfoot

HHRA Lead; West Don Lands; Ontario Infrastructure and Lands Corporation (IO); Toronto, Ontario; 2010 to Present. The largest brownfield site currently under development in Ontario, this former industrial site will encompass mixed-use residential and commercial development, as well as a substantial parkland component, after it serves as the Pan American Athletes' Village (PAAV) for the 2015 Pan/Parapan American Games (Pan Am Games). The PAAV will house over 8,000 athletes and coaching staff. This revitalization project involved an aggressive schedule to secure the environmental approvals required in advance of infrastructure and building construction by development partners. Site characterization, risk assessment (RA), remedial option feasibility studies (ROFSs), remediation, and risk mitigation measures (RMMs) are key project components. CH2M HILL Canada Limited (CH2M HILL) conducted field investigations and prepared multiple Phase One and Two ESA, ROFS, and RA reports in parallel in order to meet the development schedule. The reports complied with Ontario Regulation (O. Reg.) 153/04 under the *Environmental Protection Act*, as amended by O. Reg. 511/09, such that Records of Site Condition (RSCs) will be obtained on properties prior to development. Currently, CH2M HILL is acting as the third-party Ontario Ministry of the Environment (MOE) Qualified Person (QP) to audit compliance with the Certificates of Property Use (CPUs) and RAs during the implementation of the RMMs.

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As the Human Health Risk Assessment (HHRA) Lead for the WDL project, responsible for coordinating the completion of nine RA reports. To ensure the HHRA components of the reports are completed according to the accelerated schedule, coordinates a team of 20 HHRA staff, and has engaged multiple stakeholders on numerous technical issues. In addition, serves as the key RA contact for the ecological risk assessment (ERA), ESA, and Risk Management teams, liaising with these teams to ensure the concurrent development of multiple sections of the reports does not jeopardize report quality and harmonization.

Experience Prior to CH2M HILL

Lead Risk Assessor; RA for Multi-Tenant Commercial Property; Confidential Client; Waterloo, Ontario; 2010. Completed data evaluation, summary of Phase I and II Environmental Site Assessment (ESA) Reports and RA approach document in support of completing and filing a Pre-Submission Form (PSF) with the MOE. The PSF is currently under MOE review.

RA Consultant; RA Evaluation for Industrial/Commercial Property; Confidential Client; Niagara Falls, Ontario; 2010. Conducted a review of Phase I and II ESA Reports, and additional investigative reports, to determine potential for property to obtain a Record of Site Condition through the RA process. Presented findings to client, potential buyer, and legal aid for the buyer.

Lead Risk Assessor; Development of Risk-based Standards for Commercial Property; Confidential Client; Hamilton, Ontario; 2009. Developed risk-based property-specific standards (PSSs) based on human exposure to the site under current and future land use scenarios. The development of the PSSs was requested to aid in securing financial support for the proposed redevelopment of the site.

Lead Risk Assessor; RA for Former Service Station; Confidential Client; Gualala, California; 2009. Developed site-specific human health risk-based cleanup levels for total petroleum hydrocarbons following San Francisco Bay Regional Water Quality Control Board and California Environmental Protection Agency (CalEPA) Guidance.

Risk Assessor; RA for 35 Regan Road; SARC Realty Holdings Limited; Brampton, Ontario; 2007 to 2009. Conducted an RA under O. Reg. 153/04 for an RSC [including completion of a MOE PSF, identification of Contaminants of Concern (COCs), identification of potentially complete human and ecological exposure pathways, calculation of human health and ecological risks, development of PSSs, preparation of RA report, and responding to MOE comments on the RA report]. The RSC was requested in relation to the sale of the property. The property

was utilized for blow molding, and handling and blending automotive and petroleum products for packaging and distribution. The RSC was filed in 2009.



Terry Lorentz

Contract Administration/Construction Oversight Lead

Education

Environmental Engineering, Post Diploma, Conestoga College, Kitchener, Ontario
B.E.S., University of Waterloo, Ontario

Distinguishing Qualifications

- Environmental contractor and consultant working in senior construction management, estimating, and business development roles

Relevant Experience

Terry has extensive experience in contract management and execution of remedial construction. He has developed, estimated and managed over 200 projects in Canada and the United States involving building decommissioning; aboveground and underground storage tank removal; soil excavation, removal and disposal; hazardous waste management; liquid waste disposal; waste screening; bioremediation; soil stabilization; vapour extraction and groundwater treatment with single project values exceeding \$10M.

Representative Projects

Senior Cost Estimator; Environmental Site Assessment (ESA) and Preparation of Remediation Strategy; Sydenham Pearl Brownfield; City of Brantford; Brantford, Ontario; 2012. The Sydenham Pearl Brownfield consists of two parcels of land in downtown Brantford, both with industrial legacies dating back to the early 1900s. CH2M HILL was retained to conduct Phase One and Two ESAs, and to prepare a Remedial Action Strategy to revitalize the properties for potential residential development. Work included consultation with city staff, a public meeting, and presentations to City Council. Work was completed to the satisfaction of the City, the public, and City Council, and resulted in the approval of funds for implementation of the remedial strategy.

Project Management, Demolition/Senior Technical Consultant, Demolition; Former Amherstburg Manufacturing Facility, Environmental Site Assessment, Risk Assessment, Remedial Planning, Contract Administration and Demolition Oversight; Confidential Client, 2010 to Present. CH2M HILL was retained to provide environmental advisory and construction management services for the decommissioning of a large abandoned chemical manufacturing facility. Services provided have included Phase Two ESAs, Risk Assessment activities, preparation of tender documents and tendering for facility demolition and remediation services, project administration and construction oversight. Work is being conducted with regular consultation with the client, the public, and municipal and regulatory personnel. Onsite environmental activities have been coordinated with the demolition of over 300,000 ft² of manufacturing space, with strict observance of health and safety protocols.

Technical Construction Lead; West Don Lands; Ontario Infrastructure and Lands Corporation (IO); Toronto, Ontario; 2010 to Present. The largest brownfield site currently under development in Ontario, this former industrial site will encompass mixed-use residential and commercial development, as well as a substantial parkland component, after it serves as the Pan American Athletes' Village (PAAV) for the 2015 Pan/Parapan American Games (Pan Am Games). The PAAV will house over 8,000 athletes and coaching staff. This revitalization project involved an aggressive schedule to secure the environmental approvals required in advance of infrastructure and building construction by development partners. Site characterization, risk assessment (RA), remedial option feasibility studies (ROFSs), remediation, and risk mitigation measures (RMMs) are key project components. CH2M HILL Canada Limited (CH2M HILL) conducted field investigations and prepared multiple Phase One and Phase Two environmental site assessment (ESA), ROFS, and RA reports in parallel in order to meet the development schedule. The reports complied with Ontario Regulation (O. Reg.) 153/04 under the *Environmental Protection Act*, as amended by O. Reg. 511/09, such that Records of Site Condition (RSCs) will be obtained on properties prior to development. Currently, CH2M HILL is acting as the third-party Ontario Ministry of the Environment (MOE) Qualified Person (QP) to audit compliance with the Certificates of Property Use (CPUs) and RAs during the implementation of the RMMs.

Terry Lorentz

In October 2011, the WDL project was selected by the Canadian Urban Institute for the **2011 Brownie Award** as the project that best demonstrated **Excellence in Project Development at the Neighbourhood Scale**. The annual Brownie Awards program recognizes leadership, innovation, and environmental sustainability in brownfield redevelopment across Canada.

As the ROFS Lead for the WDL project, responsible for coordinating the completion of eight ROFS reports and contributing the RMMs component of the RA document. To ensure the RMM components of the RA reports and ROFS documents are completed according to the accelerated schedule, coordinated a team of 11 ROFS staff, and engaged multiple stakeholders on numerous technical issues.

Senior Construction Consultant; Klondike Highway Maintenance Camp; The Government of Yukon; Dawson, Yukon. Consulting advisor to Yukon Environment. Providing excavation, land treatment facility construction and post-remedial drilling support for costing, tender development and project execution.

Project Consultant; Deloro Mine Site Cleanup; Ministry of the Environment (MOE); Deloro, Ontario. Provided comprehensive estimates of heavy construction costs and performed constructability reviews of detailed design drawings and draft technical specifications for the Tailings Area and Industrial/Mine Area.

Senior Construction Consultant; Gitxaala Landfill Site Investigation and Remediation; Gitxaala Nation; Kitkatla, BC. Prepared a detailed cost estimate for a large (over \$7M) remediation project and provided Client with remedial construction management throughout the works.

Estimator; Contaminated Site Remediation; Estimation of Remediation Cost, Experimental Proving Grounds, Canadian Forces Base (CFB), Suffield, Alberta; Defence Research and Development Canada. Worked with project team to evaluate and develop costs to conduct remediation and demilitarization activities. Remediation will be completed in accordance with the requirements of the Federal Contaminated Sites Action Plan (FCSAP). An in-depth financial analysis and cash flow projections were prepared and forecasted through the remainder of the works.

Estimator; Waste Management Services and Landfill Closure; Pelee Island Waste Management System; Pelee Island, Ontario. Prepared an engineering cost estimate for the closure of a municipal solid waste (MSW) landfill including capping and vegetation, construction of a stormwater pond, and construction of an onsite transfer station and site grading. Cost estimate included pricing the transportation of large equipment and materials by ferry from the mainland to Pelee Island. Also reviewed technical specifications from a constructability aspect.

Senior Construction Consultant; Decommissioning and Remediation of an Abandoned Mine Site; Manitoba Conservation; Gods Lake, Manitoba. In 2000, Manitoba established the Orphaned/Abandoned Mine Site Rehabilitation Program to address public safety and environmental health concerns associated with orphaned/abandoned mine sites. Provided consulting and cost estimate support for the remediation and decommissioning of the Gods Lake Abandoned Mine.

Senior Construction Lead; Various Projects; Confidential Client; Sarnia, Ontario. Construction lead for a variety of remediation projects which are part of a large remediation program at a former chemical plant/industrial facility.

Senior Construction Lead and Estimator; Various Projects; Confidential Client; Alberta. Construction lead for a variety of remediation projects that are part of a large remediation program at a former chemical plant/industrial facility.

Senior Construction Lead and Estimator; Various Projects; Lanxess; Sarnia, Ontario. Construction lead for a variety of remediation projects that are part of a large remediation program at a former chemical plant/industrial facility.



Andrea Wojtyniak

Environmental Design Specialist

Education

Post-Graduate Coursework, Environmental Biology, Toxicology Option, University of Guelph, Guelph, Ontario
B.Sc., Honours Science and Business, Biology Option, Co-Operative Education, University of Waterloo, Waterloo, Ontario

Relevant Experience

Andrea Wojtyniak is an Environmental Design Specialist in the Environmental Services Business Group in Toronto, Ontario. She has 6 years of experience conducting environmental science investigations, including approximately 4 years of experience in risk assessment (RA) and vapour intrusion (VI) assessment in both Canada and the United States.

Representative Projects and Dates of Involvement

HHRA Team Member; Former Amherstburg Manufacturing Facility, Environmental Site Assessment, Risk Assessment, Remedial Planning, Contract Administration and Demolition Oversight; Confidential Client, 2010 to Present. CH2M HILL was retained to provide environmental advisory and construction management services for the decommissioning of a large abandoned chemical manufacturing facility. Services provided have included Phase Two ESAs, Risk Assessment activities, preparation of tender documents and tendering for facility demolition and remediation services, project administration and construction oversight. Work is being conducted with regular consultation with the client, the public, and municipal and regulatory personnel. Onsite environmental activities have been coordinated with the demolition of over 300,000 ft² of manufacturing space, with strict observance of health and safety protocols. As an HHRA Team Member, responsible for coordinating the development and completion of the individual RA report(s). Also responsible for numerous technical aspects related to the development of the RA, including the completion of Pre-Submission Forms (PSFs), preparation of technical memos identifying the building blocks and RA approach for client and regulator consideration, identification of chemicals of concern (COCs), automation of risk calculations, conduct of indoor air and outdoor air modelling, performance of risk calculations, preparation of supporting calculations and documentation following MOE guidance and the MOE 2011 Rationale Document, development of Property-Specific Standards (PSSs), and implementation of various quality control procedures.

HHRA Team Member and Report Coordinator; West Don Lands; Ontario Infrastructure and Lands Corporation; Toronto, Ontario; 2010 to 2011. The largest brownfield site currently under development in Ontario, this former industrial site will encompass mixed-use residential and commercial development, as well as a substantial parkland component. The immediate development plan is for the majority of the site to become home to the Athletes' Village for the 2015 Pan/Parapan American Games. This revitalization project involves an aggressive schedule to secure the environmental approvals required in advance of infrastructure and building construction by development partners. Site characterization, risk assessment (RA), remedial option feasibility studies (ROFSs), remediation, and risk mitigation measures (RMMs) are key project components. CH2M HILL is conducting field investigations and preparing multiple Phase I and Phase II environmental site assessment (ESA), ROFS, and RA reports in parallel in order to meet the schedule. The reports will comply with Ontario Regulation (O. Reg.) 153/04 under the *Environmental Protection Act*, as amended by O. Reg. 511/09, such that Record of Site Conditions (RSCs) will be obtained on properties prior to development.

As an HHRA Team Member for the WDL project, responsible for ensuring the RA reports were completed with a high level of quality. Specifically, served as the Technical Lead of two RA reports, and supported the development of an additional six RA Reports. As Technical Lead, responsible for coordinating the development and completion of the individual RA report(s). Also directly responsible for numerous technical aspects related to the development of the RA, including the completion of Pre-Submission Forms (PSFs), preparation of technical memos identifying the building blocks and RA approach for client and regulator consideration, identification of chemicals of concern (COCs) for an environmentally sensitive site using Table 1 Site Condition Standards (SCS), automation

Andrea Wojtyniak

of risk calculations, automation of models used to support the RAs, identification of appropriate toxicological data for use in the RA, development of detailed justification for the use of these toxicological data, development of toxicity profiles, conduct of indoor air and outdoor air modelling, performance of risk calculations, preparation of supporting calculations and documentation following MOE guidance and the MOE 2009 Rationale Document, development of Property-Specific Standards (PSSs), and implementation of various quality control procedures. Also liaised with the client, participating in the comment resolution process and ensuring client comments were appropriately addressed in the final products.

Experience Prior to CH2M HILL

Risk Assessor; Confidential Client; Cambridge, Ontario; 2010. Developed and submitted Pre-Submission Form (PSF) to the Ontario Ministry of Environment (MOE) in accordance with O.Reg.153/04. The development of the PSF was requested to begin the risk assessment process for the proposed sale of the site.

Risk Assessor; Confidential Client; two locations in Ohio; 2009 to 2010. Conducted two Human Health Risk Assessments (HHRAs) for petroleum-related impacts at two former service stations following Ohio Bureau of Underground Storage Tank Regulations (BUSTR) guidance and models (including the use of BUSTRSscreen).

Risk Assessor; Confidential Client; various locations in Washington; 2009 to 2010. Conducted HHRAs for petroleum-related impacts at several former service stations, in accordance with Washington Department of Ecology Model Toxics Control Act (MTCA) guidance.

Risk Assessor; Confidential Client; various locations in California; 2007 to 2010. Conducted numerous HHRAs and developed site-specific human health risk-based cleanup levels for petroleum-related impacts in accordance with California Regional Water Quality Control Board (RWQCB), Department of Toxic Substances (DTSC), Office of Environmental Health Hazard Assessment (OEHHA), and California Environmental Protection Agency (CalEPA) guidance and models (including LeadSpread and the Johnson and Ettinger Models).

Risk Assessor; Confidential Client; Ardmore, Oklahoma; 2006 to 2009. Assisted in the development of site-specific human health risk-based cleanup levels for soil for a former oil refinery based on residential landuse according to Oklahoma Department of Environmental Quality (ODEQ) guidance.

Risk Assessor; RA for 35 Regan Road; SARC Realty Holdings Limited; Brampton, Ontario; 2007 to 2009. Provided project support for all aspects of an RA under O. Reg. 153/04, for an industrial property that had been used for blow molding, and handling and blending automotive and petroleum products for packaging and distribution. Project requirements included completion of an MOE PSF, identification of Contaminants of Concern (COCs), identification of potentially complete human and ecological exposure pathways, calculation of human health and ecological risks, development of property-specific standards (PSSs), preparation of RA report, and responding to MOE comments on the RA report. The record of site condition (RSC) was requested in relation to the sale of the property, and was filed in 2009.

Risk Assessor; RA for 18 Lower Jarvis Street; Harold Gross Realty Inc. and Michael Gross Realty Ltd.; Toronto, Ontario; 2007 to 2009. Provided project support for all aspects of an RA under O.Reg. 153/04 for a RSC. The RSC was required as the property was planned for redevelopment to a more sensitive landuse (from industrial/commercial to mixed residential/commercial). The RSC was filed in 2009.

Project Consultant; Risk Ranking for Energy Management Facilities; Confidential Client; Ontario; 2007. Supported a risk ranking process through the classification of chemical, geographical, geological, and land use data for energy management facilities across Ontario.

VI Consultant; VI Assessment of Former Dry Cleaning Site; Confidential Client; Ottawa, Ontario; 2006 to 2009. Assessed the potential for vapour intrusion into residences and a mall impacted by the plume of a former dry cleaning facility. The risk evaluation followed MOE 1996 and USEPA guidance.

Wayne Cooley

Remedial Strategy Review



Education

B.A.Sc. (Honours), Civil (Environmental) Engineering, University of Toronto, Toronto, Ontario

Diploma (Honours), Civil Engineering Technology, Ryerson Polytechnical Institute, Toronto, Ontario

Professional Registrations

Professional Engineer: Ontario (1992, No. 90331448)

Distinguishing Qualifications

- Focused and detail oriented
- Excellent problem solving and communication skills
- Effective liaison with clients and regulatory agencies
- Diverse project experience that includes landfill design/waste management, environmental site investigation/remediation, and municipal works

Relevant Experience

Mr. Cooley is a senior engineer with over 20 years of design and management experience in environmental/municipal engineering and construction. His primary expertise is in the area of waste management, with emphasis on landfill permitting, design, development, operation, closure, monitoring, and reporting. Additional significant experience consists of environmental site investigation/remediation, impervious linings, groundwater/leachate collection, pumping systems, stormwater management, and municipal works. Mr. Cooley has extensive experience with planning and design issues, including public consultation and approvals processes. Throughout his career, he has been extensively involved in both environmental and municipal construction works, providing a broad range of related services such as tender/contract administration, construction inspection and warranty administration. Mr. Cooley has successfully managed or completed a wide range of projects for public and private clients, and has provided effective liaison with regulatory agencies for securement of approvals.

Representative Projects

Environmental Site Investigation/Remediation

Mr. Cooley has participated in a wide range of projects involving environmental site investigations and groundwater/soil remediation. Major projects have comprised the preparation of risk evaluation, environmental and hydrogeologic investigation reports; detailed design of groundwater extraction and treatment systems; remediation of an oil interceptor pond; removal of underground storage tanks; and waste characterization and offsite disposal of hydrocarbon contaminated soils.

- Development of a remedial action plan, including a field investigation program (that is, geophysics and soil sampling/analysis) and identification/evaluation of appropriate remediation technologies, for a skeet shooting range in Toronto, Ontario.
- Detailed design of a groundwater extraction and treatment system for an industrial site in Toronto, Ontario.
- Development of performance specifications and securing of contractor quotations to solidify/stabilize lagoon sludge from a butyl-rubber manufacturing process, so that it could be disposed of as a non-hazardous solid industrial waste at their proprietary landfill in Sarnia, Ontario.
- Detailed design, preparation of design brief, construction inspection and tender/contract administration for a groundwater extraction and treatment system at a commercial development site in Guelph, Ontario.

Wayne Cooley

- Preparation of risk evaluation, environmental, and hydrogeologic site investigation reports for a commercial development site in Guelph, Ontario.
- Detailed design for remediation of an oil interceptor pond (relining with flexible geomembrane) at an industrial site in Guelph, Ontario.
- Detailed design, preparation of contract documents, construction inspection and tender/contract administration for a groundwater collection system at an industrial site in Perth, Ontario.
- Miscellaneous fieldwork and preparation of documentation with respect to the removal of underground storage tanks and excavation, waste characterization, and offsite disposal of hydrocarbon contaminated soils at various industrial sites in Ontario.
- Development of hydraulic (that is, water level) monitoring and water/soil quality sampling programs.

Senior Technical Consultant; Kingston Dry Docks Risk Assessment; Public Works and Government Services Canada; Kingston, Ontario; July to August 2012. Provision of senior technical advisory/review support for conceptual design of vapour intrusion and soil gas migration mitigation components of the risk assessment.

Senior Project Engineer; Closed Non-Hazardous Landfill; Confidential Client; Southwest Ontario; June to July 2012. Completion of a financial assurance re-evaluation for a closed non-hazardous solid industrial waste landfill and a gypsum solids settling basin.

Senior Technical Consultant; York Community Centre Risk Assessment; City of Toronto; Toronto, Ontario; May to June 2012. Provision of senior technical advisory/review support to peer review, on behalf of the City of Toronto, the tender/construction drawings and technical specifications to ensure conformance with conceptual design elements of the proposed vapour intrusion and soil gas migration mitigation risk assessment components.

Experience Prior to CH2M HILL

Senior Technical Consultant; Newalta Landfill; City of Hamilton; Stoney Creek, Ontario; 2010 and 2011. Provision of senior technical advisory/review support to peer review, on behalf of the City of Hamilton, for a landfill impact assessment (Newalta closed and active landfills) prepared for several adjacent development properties. A follow-up peer review on another development property adjacent the active and closed landfills was subsequently awarded and completed.

Senior Technical Consultant; Closed Sabiston Landfill; Town of Markham; Markham, Ontario; 2009 to 2011. Provision of senior technical advisory/review support for the water quality monitoring program and active landfill gas collection/flaring system.

Senior Technical Consultant; Inter – Recycling Systems Landfill; Ministry of the Environment; Sarnia, Ontario; 2009 to 2011. Provision of senior technical advisory/review support for preparation of a hydrogeological assessment, closure/post-closure plan and remedial contingency plan (Waterloo Barrier sheet pile wall).

Senior Technical Consultant; Closed Quinte Sanitation Landfill; Ministry of the Environment; Quinte West, Ontario; 2009 to 2011. Provision of senior technical advisory/review support for preparation of a closure/post-closure plan to remediate water quality, landfill gas and final cover issues.

Senior Technical Consultant and Design Manager; Kidd Mine Landfill Site “B”; Xstrata Copper Canada; Timmins, Ontario; 2008 to 2011. Provision of senior technical advisory/review support and acted as Landfill Design Group Lead for the environmental assessment, design, and permitting of Landfill Site “B”.

Senior Technical Consultant; New Liskeard and Haileybury Landfills; City of Temiskaming Shores; Temiskaming, Ontario; 2009 to 2010. Provision of senior technical advisory/review support for the completion of a feasibility study for development of a long-term waste disposal (landfill expansion) with respect to the closed New Liskeard and active Haileybury Landfills.



Janie Brenner

Cost Estimator

Education

Technologist Diploma, Terrain and Water Resource Management, Sir Sandford Fleming College
Technician Diploma, Terrain and Water Resource Management, Sir Sandford Fleming College

Professional Registrations

Canadian Certified Environmental Practitioner (CCEP), 2011

Distinguishing Qualifications

- Over 8 years' experience in the environmental industry

Relevant Experience

Janie Brenner joined the Environmental Services Business Group (ESBG) in CH2M HILL's Kitchener, Ontario office in 2012. She brings with her over 8 years of experience in the environmental industry, 6 years of which were spent working as a project manager and estimator for an environmental construction firm.

Representative Projects and Dates of Involvement

Remedial Construction Estimating, Environmental Task; Former Amherstburg Manufacturing Facility, Environmental Site Assessment, Risk Assessment, Remedial Planning, Contract Administration and Demolition Oversight; Confidential Client, 2010 to Present. CH2M HILL was retained to provide environmental advisory and construction management services for the decommissioning of a large abandoned chemical manufacturing facility. Services provided have included Phase Two ESAs, Risk Assessment activities, preparation of tender documents and tendering for facility demolition and remediation services, project administration and construction oversight. Work is being conducted with regular consultation with the client, the public, and municipal and regulatory personnel. Onsite environmental activities have been coordinated with the demolition of over 300,000 ft² of manufacturing space, with strict observance of health and safety protocols.

Experience Prior to CH2M HILL

Lead Estimator; Deloro Mine Site; Industrial and Mine Area Cleanup Phase 1; Ontario Ministry of the Environment (MOE); Deloro, ON; August 2011. Acted as lead estimator for the request for proposal (RFP). Worked with a team to ensure the successful submission of a compliant proposal. Major responsibilities included reviewing and understanding the scope of work and all associated supporting documents, procuring competitive material and subcontractor quotes, completing a detailed costs estimate, and composing a 200 page technical proposal. The RFP award was based on a pass or fail on the technical proposal followed by award to the lowest bidder. Following the project award, worked with the assigned project manager and completed a comprehensive handoff.

Lead Estimator; Victoria Park Lake Improvement; City of Kitchener; Kitchener, ON; October 2011. Acted as lead estimator for the RFP. Worked with a team to ensure the successful submission of a compliant bid. Major responsibilities included reviewing and understanding of the scope of work and all associated supporting documents, procuring competitive material and subcontractor quotes, and completing a detailed costs estimate. Due to the nature of the work, bench scale testing was completed to evaluate various solidification technologies in preparation for the submission.

Project Manager; Aboriginal Heavy Equipment Training Program; ECO Canada and Government of Manitoba, Mineral Resources Division; Lynn Lake, MB; November 2011. The project comprised the execution of a 3-week heavy equipment training program for a group of 10 Aboriginal people. Janie's work included creating a training curriculum, selecting candidates, and coordinating the field training activities.

Janie Brenner

Project Manager; Aboriginal Heavy Equipment Training Program; Manitoba Entrepreneurship, Training, and Trade (METT), Government of Manitoba; Lynn Lake, MB; November 2011. The project comprised the execution of a 4-week, heavy equipment training program for a group of 12 Aboriginal people. The work included the creating a training curriculum, selecting candidates, and coordinating the field training activities.

Lead Estimator & Project Manager; City of Barrie Landfill Reclamation and Cell 2B/2B Cell Construction; City of Barrie; Barrie, ON; March 2010 to 2011. Acted as lead estimator and later as project manager for the first year of the 3-year project. The scope of work consisted of the excavation and screening of over 684,000 cubic metres (m³) of municipal solid waste (MSW), the segregation of waste from fines, the placement and compaction of screen waste, and the construction of three new engineered landfill cells.

Estimator; City of Barrie Landfill Gas Collection System Installation; City of Barrie; Barrie, ON; July 2011. Acted as lead estimator for the successful submission of the RFP.

Project Manager; Leachate Toe Drain Installation; Waste Management Corporation; Petrolia, ON; March 2011. Acted as project manager for the installation of a leachate toe drain in an existing industrial and municipal landfill. The scope of work included the excavation of a 5 to 7 metre (m)-deep trench, the placing of a drainage stone, the installation of an 8-inch high density polyethylene (HDPE) pipe and the management of leachate within the work area.

Project Manager & Estimator; Interior Soil Remediation; Markham Road Apartments Ltd.; Toronto, ON; June 2011. Acted as estimator and project manager for the remediation of hydrocarbon-impacted soils located in the basement of a high-rise residential apartment building. The scope of work included the procurement of building permits, the interior demolition of a shower and sauna room, the excavation and disposal of impacted soil, the management of impacted groundwater, and the restoration of the site. To facilitate the work and reduce the requirement for manual labour, a pass-through entrance was installed in the concrete foundation wall below ground, and heavy equipment was utilized to complete the work.

Project Manager; Trichloroethene (TCE)-Impacted Soil Remediation; Confidential Client; Hamilton, ON; September 2011. Oversaw the remediation of TCE-impacted soil in Hamilton. Over 8000 tonnes of impacted soils were excavated and 600,000 litres (L) of impacted water was treated onsite through a mobile water treatment system. Because of the nature of the contaminants, air quality was continuously monitored and a portion of the work was completed under supplied air.

Lead Estimator; St. Catharines Dump Site Remediation; Public Works and Government Services Canada (PWGSC); St. Catharines, ON; January 2010. Acted as lead estimator for this request for quotation (RFQ) and successfully submitted the winning bid. The scope of work consisted of excavating the site.

Project Manager; Cell Construction and Automotive Shredder Residue (ASR) Management; Gerdau AmeriSteel; Whitby, ON; June 2008. Managed the construction of a landfill cell and the daily hauling, placement, and compaction of ASR for the recycling division. Due the team's creative thinking, the project realized significant cost savings by using agricultural equipment instead of traditional heavy equipment.

Project Manager; Tanks Farm Demolition; Confidential Client; St. George, ON; March 2009. Managed the demolition of six large aboveground fuel storage tanks located within a former bulk processing facility. The tanks, which measured between 34 and 46 feet in diameter, were sheared in sections and the scrap was processed and shipped offsite for recycling.

Project Manager; Soil Remediation; Confidential Client; Hanover, ON; November 2009. Acted as project manager for the remediation of hydrocarbon-impacted soil. Approximately 6,000 tonnes of impacted soils were excavated and shipped offsite for disposal while 4,000 tonnes of clean fill was excavated and segregated onsite. Impacted groundwater was also collected and treated onsite.



Ryan Manning

Contract Administration/Tender Documents

Education

B.Sc. (Eng.) (Honours), Environmental Civil Engineering, University of Guelph

Professional Registrations

Professional Engineer: Ontario (No. 100079585)

Professional Engineer: Alberta (No. 98049)

Relevant Experience

Ryan Manning joined CH2M HILL's Environmental Business (ES) Team in the Site and Sediment Management Business Group in 2005. He is an intermediate project engineer with more than ten years experience in environmental investigations and remediation projects including waste management. He is experienced in the development and coordination subsurface investigation and remediation for metals contamination, petroleum hydrocarbon, and chlorinated solvent contamination in both the soil and groundwater systems. In addition, Ryan has developed and managed/conducted various pump and treat and in-situ groundwater remediation systems. He is experienced and qualified in borehole installation, monitoring well instrumentation, groundwater development and sampling, surface water sampling, leachate sampling, landfill gas sampling, soil sampling, waste characterization sampling, test pit installation, confirmatory sampling, soil vapour sampling, and surveying. Ryan's experience includes coordination and completion of municipal landfill annual monitoring and progress programs involving groundwater, surface water, leachate and landfill gas monitoring requirements, design and construction oversight of leachate collection systems, landfill cell base preparations, and landfill gas collection systems.

Representative Projects and Dates of Involvement

Contract Administration; Environmental Site Assessment (ESA) and Preparation of Remediation Strategy; Sydenham Pearl Brownfield; City of Brantford; Brantford, Ontario; 2012. The Sydenham Pearl Brownfield consists of two parcels of land in downtown Brantford, both with industrial legacies dating back to the early 1900s. CH2M HILL was retained to conduct Phase One and Two ESAs, and to prepare a Remedial Action Strategy to revitalize the properties for potential residential development. Work included consultation with city staff, a public meeting, and presentations to City Council. Work was completed to the satisfaction of the City, the public, and City Council, and resulted in the approval of funds for implementation of the remedial strategy.

Project Engineer; Former Amherstburg Manufacturing Facility, Environmental Site Assessment, Risk Assessment, Remedial Planning, Contract Administration and Demolition Oversight; Confidential Client, 2010 to Present. This project involves the complete demolition of decommissioning of a 300,000 ft², former chemical production facility. The facility is located in the Town of Amherstburg and is surrounded by mixed land use, including residential and industrial. The facility was constructed near the turn of the century and as such, the construction materials contain significant amounts of designated substances. Due to the proximity of the facility to residential dwellings, hazard and risk mitigation measures were developed and approved by the Ontario Ministry of the Environment to minimize the potential off site impacts resulting from demolition activities. In addition, the Site is located within an area with designated Species at risk. Mitigation measures were evaluated and implemented with the concurrence of the Ontario Ministry of Natural Resources in order to facilitate completion of the works while protecting the potential species at risk receptors in the area.

Ryan is responsible for coordination of site activities, including waste identification, quantification and classification, Hazardous Building Material Assessments, Structural Assessments, and cost forecasting, including salvage value and demolition procedure/scheduling. Ryan prepared construction bid documents including all technical specifications and drawings, issued addendums to the tender document, and completed tender evaluation and tender recommendations. Ryan also developed surface water and dust monitoring and mitigation plans in support of the demolition work and provided onsite supervision of contractors related to building rehabilitation efforts, the construction of a new site entrance and truck scale.

Ryan Manning

Project Engineer; Risk Assessment for Portlands Divestiture; Public Works Government Services Canada (PWGSC); Port Stanley, Ontario; 2008 to Present. Lead the development of a detailed cost estimate for remediation as part of a comprehensive project involving a contaminated site investigations and risk assessment to assess soil/groundwater conditions in uplands assessment and sediment contamination in waterlots. The investigation was completed to facilitate the divestiture of federal lands to a local municipality. The risk assessment was completed to federal and provincial standards leading to filing of a Record of Site Condition. Lead the development of RAPs and order of magnitude cost estimates.

Project Engineer; Demolition of Former Industrial Facility, Reichhold Industries Limited, Burlington, Ontario; 2011 – Present. Responsible for preparation of construction bid documents including all technical specifications and drawings. Issuing addendums to the tender document through the bid period and evaluation and tender recommendation. Completed construction cost estimates for the demolition activities. The construction component of this project will commenced in fall 2011 and will be completed in the summer 2012.

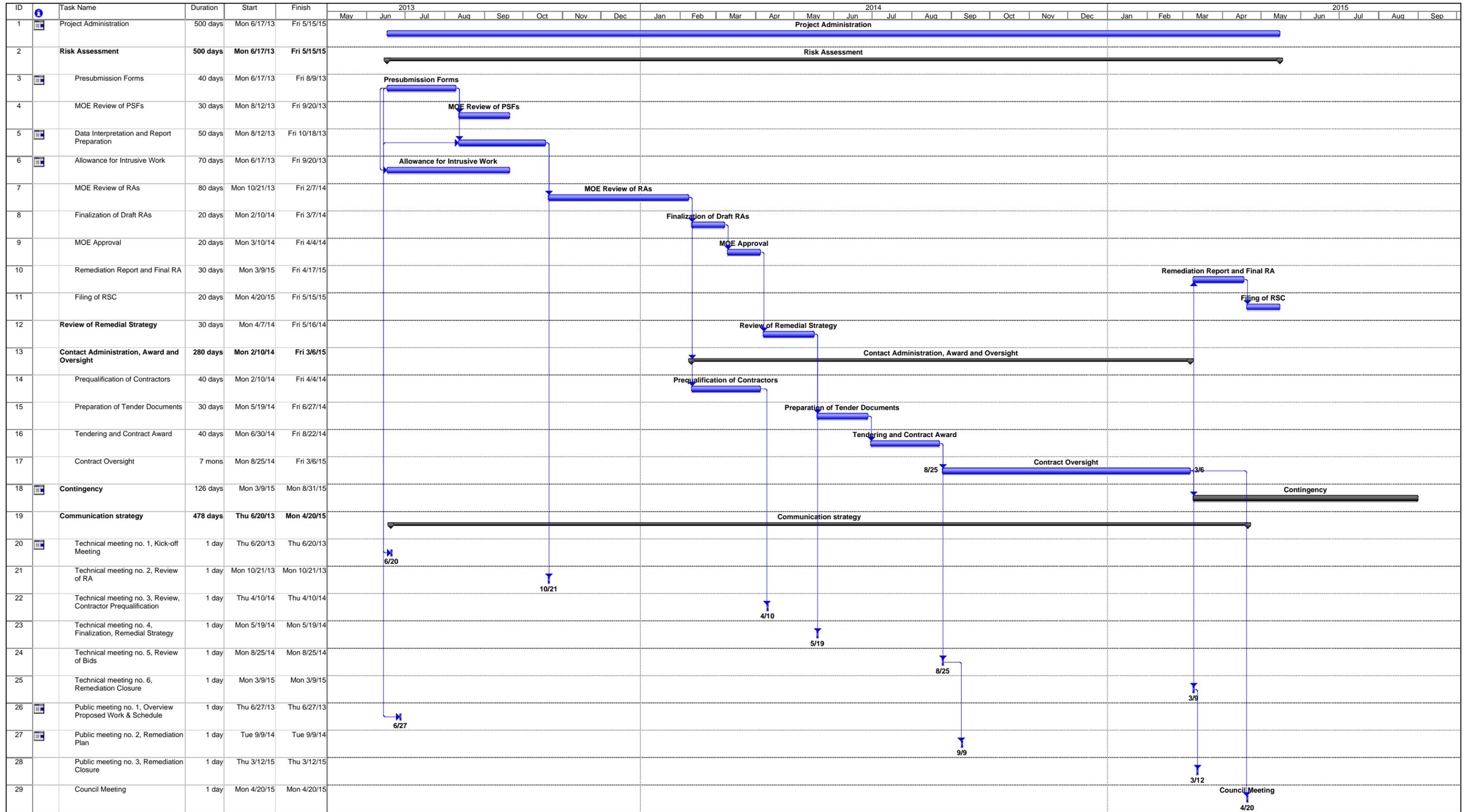
Construction Engineer/Inspector; Confidential Client Site; Sarnia, Ontario; September 2008 to Decmeber 2011. Provided engineering evaluation of tenders and subcontractor selection followed by onsite supervision to provide construction inspection and subcontractor management. Project work related to segregation of approximately 15,000 cubic metres of hazardous and non-hazardous soil containing various VOC compounds. This excavation was completed directly adjacent to a major U.S. – Canadian waterway. Excavated soils were either land filled or treated at a soil treatment facility (approximately \$1MM). Further remedial actions completed to date are: Zero-Valent Iron placement in reactive barriers for the treatment of chlorinated volatile organic compounds, pneumatic fracturing and injection of emulsified vegetable oil in 40 locations, excavation and disposal of selected “hot-spot” free-phase containing soils and phytoremediation.

Project Engineer; Contaminated Site Investigation and Remedial Action Plans; Standing Offer for Environmental Consulting Services; DCC; DRDC Experimental Proving Grounds, Suffield, Alberta; 2009 to 2010. Scope of services included peer review and data gap analysis of previous studies and investigations, UXO demilitarization planning, contaminated sites investigation and assessment, remedial action planning, design and implementation of technology evaluations and risk assessments for more than 50 APECs impacted by munitions, nuclear, biological and chemical (NBC) agents, and environmental contamination in accordance with FCSAP. Services commissioned to date include GIS, data management, technology reviews / feasibility studies, geophysical investigation review, pilot field investigation and development of investigation work plans. Led the development of contaminated site investigation work plans as well as implementation of field activities.

Project Engineer; Phase III Environmental Site Assessment, Squirrel Island, Ontario; PWGSC; 2010 to Present. Retained by PWGSC on behalf of the Fisheries and Oceans Canada (DFO) to provide lateral and vertical delineation of metal related contamination in association with APECs at a marine navigation light. Remedial options were evaluated and the preferred remedial program was recommended. The results of the Phase III ESA field program were used to update the NCSCS score for the site.

Project Engineer; Deloro Mine and Smelter Site Cleanup; Ontario Ministry of the Environment; Belleville, Ontario; 1997 to 2010. Led the development of investigation work plans, design, specifications (based on NMS), and contractor oversight for a pilot scale remedial action plan. Work as part of a \$9.4 million contract for a multi-year period to develop remediation action plans for cleanup of hazardous and radioactive wastes. The scope involved site investigation planning, intrusive (that is, test pit/boreholes) and non-intrusive (that is, geophysical surveys) investigation, technology, and feasibility reviews (that is, containment, and stabilization), detailed design, approvals (federal EA, Species at Risk, and DFO permits), health and safety plans, analytical testing, and developing cost estimates.





Project: Project schedule July start_r2
Date: Wed 4/10/13

Task Split Progress Milestone Summary Project Summary External Tasks External Milestone Deadline

Summary of Estimated Costs		Classification Level	Project Lead	Qualified Person (QP/ESA)	Communications Lead	Principal/Senior Advisor	Site Assessment Lead	Hydrogeologist	Environmental Technician	Project Engineer	Project Chemist	GIS Lead	Risk Assessor (Int-Scientist)	Junior Scientist/Engineer	Health & Safety	Pubs	Remediation Strategy Lead	Remedial Options	Construction Lead	Human Health Risk Assessment	Senior Risk Assessment Advisor	Ecological Risk Assessor	Tender Documents/Contract Administration	PDL	Administration/Accounting	Cost Estimator	Labour Subtotal	Expense Allowances		
RFP 12-04 Environmental Consulting Services Required to Complete a Remediation Strategy for the Sydenham Pearl Brownfield Site - Labour Summary		Personnel	Ed Taves	Kurt Hansen	Meggen Jones	Brian Whiffm	Dirk Scheurle	Jinlong Zang	Jamie Freeman	Tania McCarthy	Almudena Carmacho	April Bates	Andrea Wojnyniak	TBD	Lisa Moffat	TBD	Wayne Cooley	Dave Ferrish	Terry Lorentz	Krista Barfoot Kenzie	James Sprenger	Jim Kroetsch	Ryan Manning	Paul Passalant	Aideen Hamilton KA	TBD	Jamie Brenner	Allowance Amount	Description	
Task	Work Element	Task Description	Rate (\$/hour) (March 1, 2012 to March 1, 2013)	\$150.00	\$150.00	\$150.00	\$175.00	\$150.00	\$125.00	\$100.00	\$100.00	\$125.00	\$100.00	\$80.00	\$70.00	\$150.00	\$125.00	\$150.00	\$175.00	\$175.00	\$175.00	\$125.00	\$150.00	\$150.00	\$70.00	\$110.00				
1	Project Management	Project Management		192																										
		Subcontracts/POs		40																										
		Meetings		40																										
		Total Task Hours		272	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	4	192			
		Task Subtotal		\$40,800	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$300	\$600	\$15,540	\$0	\$57,240	\$4,000	
2	Risk Assessment - 17 Sydenham	Presubmission Form		7									20								4	4	2							
		Data Interpretation and Report Preparation		14	8			20	40		40	24	24	120							80	20	80							
		Allowance for Intrusive Work		8	8			40		80	20	20	16																40,191.00	Allowance for additional intrusive field work as may be required.
		Design of RMMs		2									40								24	24	40							
		Finalization of Draft RA		4	4			4	8		20	8	16	20							10	10	10	0						
		Remediation Report and Final RA		8	40		1	20	8	10	40	8	10																	
		Filing of RSC		4	20			4		40	8	4									2	2								
		Total Task Hours		47	80	0	1	88	56	90	180	68	70	200	0	8	40	0	0	0	120	60	92	40	0	0	0	0	1,240	
		Task Subtotal		\$7,050	\$12,000	\$0	\$175	\$13,200	\$7,000	\$9,000	\$18,000	\$6,800	\$7,000	\$25,000	\$0	\$640	\$2,800	\$0	\$0	\$0	\$21,000	\$10,500	\$16,100	\$5,000	\$0	\$0	\$0	\$0	\$161,265	\$40,191
3	Risk Assessment - 22 Sydenham	Presubmission Form		8									20								4	4	2							
		Data Interpretation and Report Preparation		14	8			20	40		40	24	24	120							80	20	80							
		Allowance for Intrusive Work		8	8			40		80	20	20	16															40,191.00	Allowance for additional intrusive field work as may be required.	
		Design of RMMs		2									40								24	24	40							
		Finalization or Draft RA		4	4			4	8		20	8	16	20							10	10	10	0						
		Remediation Report and Final RA		8	40		1	20	8	10	40	8	10																	
		Filing of RSC		4	20			4		40	8	4									2	2								
		Total Task Hours		48	80	0	1	88	56	90	180	68	70	200	0	8	40	0	0	0	120	60	92	40	0	0	0	0	1,241	
		Task Subtotal		\$7,200	\$12,000	\$0	\$175	\$13,200	\$7,000	\$9,000	\$18,000	\$6,800	\$7,000	\$25,000	\$0	\$640	\$2,800	\$0	\$0	\$0	\$21,000	\$10,500	\$16,100	\$5,000	\$0	\$0	\$0	\$0	\$161,415	\$40,191
4	Revision of Remedial Strategy	Allowance for Review and Revision of Remedial Strategy		8	8	4		40	16			8																8,000.00	Allowance for additional field work or other costs required to finalize the Remedial Strategy.	
		Total Task Hours		8	8	4	0	40	16	0	0	8	0	0	0	8	40	40	8	0	0	0	0	0	0	0	20	200		
		Task Subtotal		\$1,200	\$1,200	\$600	\$0	\$6,000	\$2,000	\$0	\$0	\$800	\$0	\$0	\$0	\$560	\$6,000	\$5,000	\$1,200	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$2,200	\$26,760	\$8,000	
5	Contract Administration and Contract Oversight	Prequalification of Contractors		4			2				4																			
		Preparation of Tender Documents (\$50K for all tendering)		16			4	24			40																			
		Tendering and Contract Award - Environmental		8			2	4																						
		Contract Oversight		252				252		1890				40															51,625.00	Assumed field costs of \$150/day for vehicle, gas, cell phone, meals to a total of 23,625 for 7months (7 months or 157.5 days), \$28,000 for laboratory and other expenses.
		Total Task Hours		280	0	0	8	280	0	1890	44	0	60	0	0	16	18	96	0	222	0	0	0	220	0	0	0	28	3,162	
		Task Subtotal		\$42,000	\$0	\$0	\$1,400	\$42,000	\$0	\$189,000	\$4,400	\$0	\$6,000	\$0	\$0	\$1,280	\$1,260	\$14,400	\$0	\$33,300	\$0	\$0	\$0	\$27,500	\$0	\$0	\$0	\$3,080	\$365,620	\$51,625
6	Communications Strategy	Technical Staff Meeting #1 - Kick-off		4	4	4																								
		Technical Staff Meeting #2 - RA Review		6	6	6																6								100
		Technical Staff Meeting #3 - Contractor Prequalification		6																										100
		Technical Staff Mtg #4 - Finalization of Remedial Options		6	6	6																								100
		Public Information Session #1 (RA and Remedial Options)																												250
		Meeting Preparation		4	4	4					8		8									4								
		Review with Brantford		4																										
		Attend meeting		6	6	6																								
		Technical Staff Meeting #5 - Review of Bids		6																										100
		Public Information Session #2 (Presentation of Remediation Team)																												250
		Meeting Preparation		4	4	4					8		8									4								
		Review with Brantford		4																										
		Attend meeting		6	6	6																								
		Technical Staff Meeting #6 - Remediation Closure		6	6	6																								100
		Public Information Session #3 (Remediation Closure)																												250
		Meeting Preparation		8	8	8					8		8																	
		Review with Brantford		6																										
		Attend meeting		6	6	6																								
		Council Meeting		8	4	8					8		6																	100
		Total Task Hours		90	60	64	0	0	0	32	0	30	0	0	0	0	26	0	22	0	16	0	0	0	0	0	8	348		
		Task Subtotal		\$13,500	\$9,000	\$9,600	\$0	\$0	\$0	\$3,200	\$0	\$3,000	\$0	\$0	\$0	\$3,900	\$0	\$3,300	\$0	\$3,300	\$0	\$2,800	\$0	\$0	\$0	\$0	\$880	\$49,180	\$1,450	
		Total Hours - All Tasks		745	228	68	10	496	128	2070	436	136	238	400	0	32	106	162	40	252	240	136	184	300	2	4	222	56	6,691	
		Total Cost - All Tasks		\$111,750	\$34,200	\$10,200	\$1,750	\$74,400	\$16,000	\$207,000	\$43,600	\$13,600	\$23,800	\$50,000	\$0	\$2,560	\$7,420	\$24,300	\$5,000	\$37,800	\$42,000	\$23,800	\$32,200	\$37,500	\$300	\$600	\$15,540	\$6,160	\$821,480	\$145,457

Total Costs (Labour and Cost Allowances, excluding taxes) \$966,937