

the road to  
resiliency

Sustainability Report 2015



**Klohn Crippen Berger**

65 years of service





Resiliency is the ability to prosper in challenging times and in changing business environments. In our fourth Sustainability Report we share highlights from our sustainability journey in 2015. Our direction is set by the four pillars of sustainability; social, environmental, economic and governance. As we build on our sustainable business practices we become more resilient as a company allowing us to better serve our clients, our employees and the communities we operate in.

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*Len M. Murray*

Len M. Murray, P.Eng., P.E.  
President and CEO

# from the president

Resiliency. It's a word we have heard a lot lately. The resource sectors we serve have been hit hard the last few years. Commodity prices have hit all-time lows and remain depressed in 2016. Financing is harder to come by and junior mining companies in particular have been struggling. Two significant tailings dam failures in Canada and Brazil have investors and insurers nervous and community confidence is shaken.

Currently the oil industry in Alberta and worldwide is going through a major correction. While we have seen these kinds of corrections before it is always tough when they happen and especially tough for people who are caught in the centre of the issue and lose their jobs. As I write this message, we have just witnessed devastating fires in Fort McMurray, Alberta resulting in the largest evacuation in the Province's history adding insult to injury for the oil sands sector.

All this creates a challenging environment for our clients and in turn for our firm as project work slows down in mining, oil and gas sectors. Strategic diversification is a key component to managing a sustainable business and we are pleased to see an uptick in power and transportation projects.

We remain committed to making progress on our sustainability journey and at times like these we are reminded of the importance of resiliency. Our systems provide us with a solid roadmap but it's up to each and every one of our staff to travel down the path we are forging. You will see in this year's report that we've made great progress thanks to their commitment.

In 2015, we finished the year strong with a client survey and received excellent feedback. I'm pleased to report that the overwhelming majority were very complimentary about our services. A small number of our clients suggested we have room to improve providing us with opportunities to look at how we can do things that much better.

Now, more than ever, our industry needs to embrace innovation and seek out new ways to effectively manage natural resources. In 2015, we partnered with several leading institutions to support research studies on the management of mine tailings and to develop and improve technologies that ensure the safe underground storage of CO2 and other fluids. Our hope is to find practical applications to benefit our stakeholders.

We are proud to have added new resources to manage sustainability in our project work with the addition of a TSM Verification Service Provider and an Envision Certified Professional to the team. These young professionals are taking a leadership role in advancing our sustainability efforts and I applaud their initiative.

The Women-in-Klohn (WIK) group drove several initiatives last year to support diversity in the workplace. I was honoured to attend the Association of Professional Engineers and Geosciences of Alberta Summit Awards in April to celebrate with the Calgary WIK group as they received the 2016 Women in Engineering and Geoscience Champion Award. This was well-deserved industry recognition and I commend them for their hard work and dedication.

The Women-in-Klohn group is one of the many examples of how our employees volunteer their time to support sustainability issues. Our Environmental, Health and Safety, Young Professionals and Social Committees continue to drive new initiatives to promote positive change internally and externally.

This is a pivotal moment in our industry and for those that embrace the challenge I believe we will come out of these times stronger as a community. We are being more innovative, more collaborative, and more visionary in our approach than ever before making us more resilient and in turn, more effective in meeting the needs of our stakeholders.





# about the report

This report is based on the Global Reporting Initiative (G4) framework and is intended for our communities of interest: clients, employees, government agencies, subcontractors and the communities where we operate.

## Scope and Boundary

The scope of this report includes the ten offices in which we operate in Canada, Australia, Brazil and Peru. Data reported for our in-office environmental initiatives pertain to the six offices certified to the ISO 14001 standard:

- Vancouver
- Calgary
- Edmonton
- Sudbury
- Brisbane
- Lima

## Our Focus Areas

**Our Operations** – We are committed to sustainability in the workplace and in the communities in which we operate. We report on progress under the following categories:

- Corporate Governance
- Health and Safety
- Our People
- Our Community
- Our Offices

**Our Project Work** – We have the greatest opportunity for positive impact in the work we do with our clients. We have identified key sustainable

project attributes which are described in project case studies. These attributes are captured under the following four categories:

- Environmental
- Social
- Innovation
- Design

## Data

In-office environmental data relates to the six locations certified to the ISO 14001 standard, representing over 90% of our work force.

Data reported under Our People and Our Community sections relate to our ten offices.

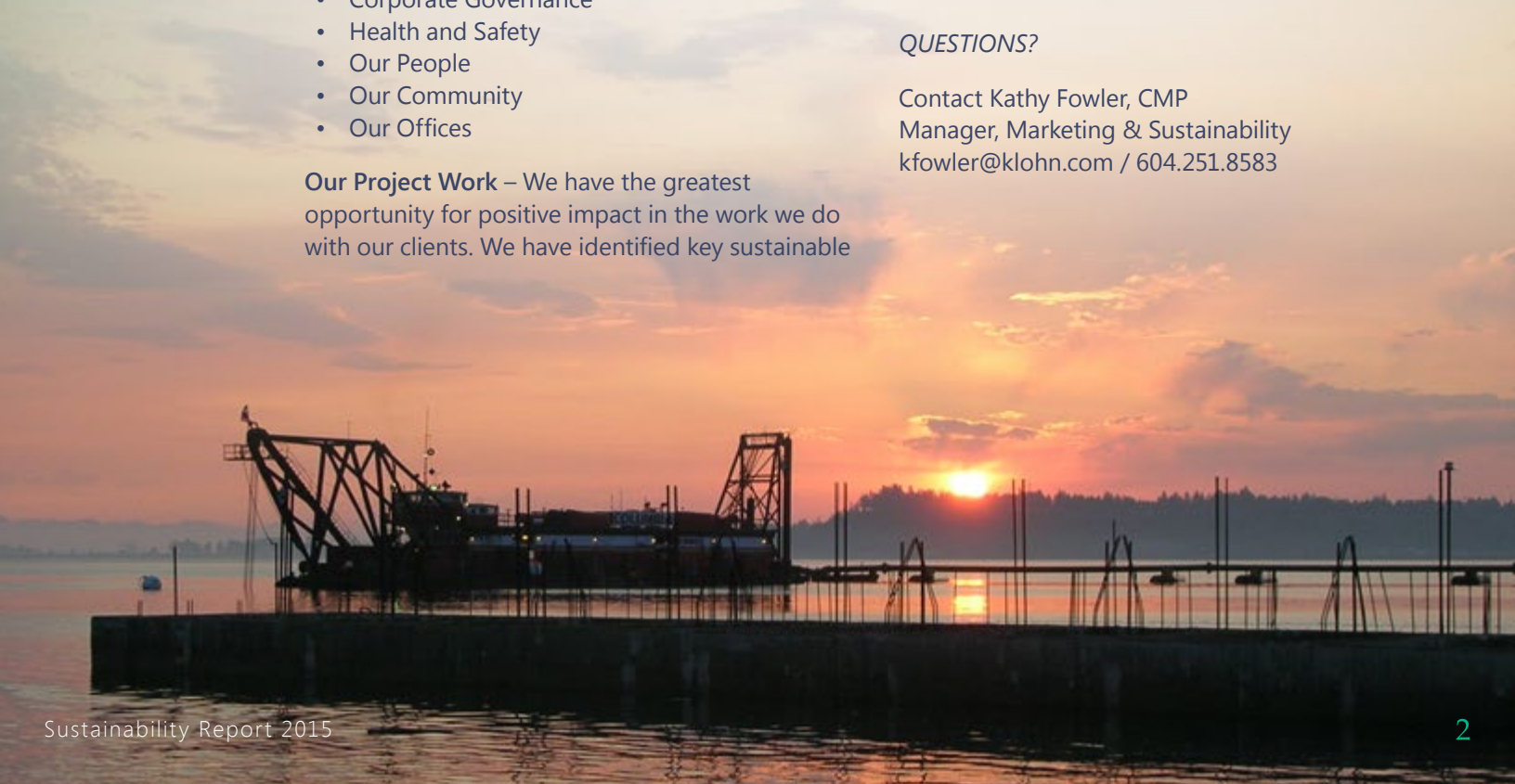
## Reporting Cycle

Sustainability data reported here is for the fiscal year ended December 31, 2015. Material information up to the date of the publication of this report (June 2, 2016) is also included.

Where available, we include comparative historical data to demonstrate trends. Some historical data are restated in this report due to improvements in our calculation methods.

## QUESTIONS?

Contact Kathy Fowler, CMP  
Manager, Marketing & Sustainability  
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## Defining Report Content (materiality)

Defining material topics to include in this report is based on the risks and opportunities important to our stakeholders, including our employees, clients, shareholders, regulators, industry associations and communities where we work. Understanding the context of our Company includes political, economic, social, technical, legal and environmental considerations, guided by the ISO and OHSAS standards, the GRI G4 framework, the Envision framework for sustainable infrastructure, and the Mining Association of Canada's commitment Towards Sustainable Mining for responsible mining, among others.

At the core of our business is our Company Charter which consists of our mission, vision and values, which is reinforced by our Code of Business Conduct and Ethics.

We identify material topics important to our stakeholders through the following methods:

### Employees

- Quarterly meetings
- Employee surveys
- On-line forums, news feeds, feedback cards and other communication methods

### Clients

- Client feedback surveys
- Requirements defined in requests for proposals
- Pre-qualification questionnaires
- Contract negotiation
- Project planning and reporting
- Participation in client technical review boards
- Sustainability / Corporate Social Responsibility Reports

### Shareholders

- Shareholder meetings
- Company Annual General Meeting (AGM)

### Regulators

- KCB's Risk Register which lists the regulatory requirements related to occupational health and safety hazards, environmental aspects related to our office operations, and professional association quality management requirements

### Industry Associations

- Membership and participation in industry associations
- Representation on boards and committees
- Sponsorship of industry conferences and workshops

### Communities

- Public workshops related to project work on behalf of our clients
- Local volunteering initiatives
- Sponsorship of local community events





# performance summary

## Our People

2015 Goals	Achieved	Not Achieved	On Track	Highlights
Provide and track focused learning and development opportunities			●	Developed several in-house training programs. Launched tap in system to track attendance. External training captured through employee Road to Success program
Develop mandatory ethics training	●			Rolled out to all staff in March 2015
Develop code of conduct and ethics for sub-consultants	●			Launched in June 2015
Succession planning			●	Developing knowledge transfer process and will implement in 2016
Host global Women-in-Klohn event	●			Held first global event for Women-in-Klohn committees

## Health & Safety

2015 Goals	Achieved	Not Achieved	On Track	Highlights
Improve our safety culture through leadership training			●	Launched the KlohnSafe for Supervisors program. 78 supervisors and managers have completed all three modules. Training and KlohnSafe sessions to continue in 2016
Obtain BC Certificate of Recognition (BC COR)	●			Passed the certification audit with a score of 91%. Received certification in January 2016
Apply for a safety award	●			Finalist for the Australian National Safety Awards of Excellence
Prepare for updates to the ISO standards			●	Completed gap analysis with current ISO and OHSAS standards. Register to ISO 45001:2016 in 2017
Global Harmonized System (GHS) for Hazardous Products	●			Updated our 640 – Managing Hazardous Products procedure to meet GHS requirements. Will conduct training sessions in 2016
Increase safety observations	●			Developed an awareness campaign and updated safety observation forms. Develop electronic safety reporting in 2016

## Our Offices

2015 Goals	Achieved	Not Achieved	On Track	Highlights
Prepare for updates to the ISO standards			●	Gap analysis between ISO and OHSAS standards complete. Register to ISO 9001:2015, ISO 45001:2016 and ISO 14001:2015 in 2017
Develop sustainable project checklist	●			We have one certified Envision Sustainability Professional and one certified Verification Service Provider with Towards Sustainable Mining. They will work with teams to advance sustainability in our project work to meet the needs of our clients. Further training and information sessions scheduled for 2016
Track business travel			●	Developed reporting method to track mileage claimed by staff. Will further refine the process before reporting data
Implement green purchasing guidelines	●			Guidelines developed with a global team consisting of all the major purchasers
Improve reporting of sustainable project attributes			●	Project sheet template now includes section for sustainable attributes. Continue to refine by using metadata in a project sheet library hosted on SharePoint

## Our Community

2015 Goals	Achieved	Not Achieved	On Track	Highlights
Research studies - look for opportunities			●	Several long term studies underway to help advance technology and methodology in the industry
Track volunteer hours		●		Calgary ran a contest in Q2 to assess the level of volunteerism in their office. We will consider how to track volunteer hours company-wide



# about KCB

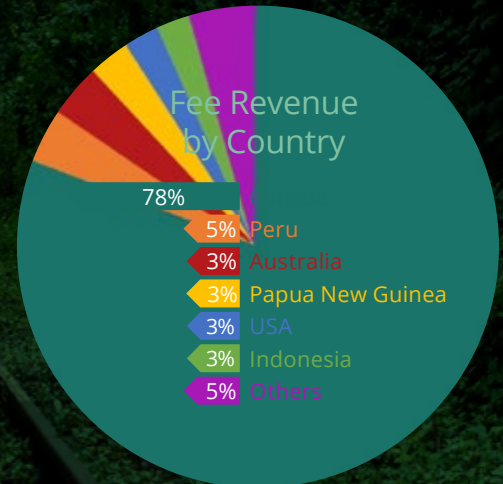
KCB is an international engineering, geoscience and environmental consulting firm with ten offices in strategic locations in Canada, Peru, Australia and Brazil. We have a strong reputation for quality and technical excellence in a range of services including mining, power and transportation, water resources, oil sands, environmental, and oil and gas.

KCB is an affiliate of Louis Berger, a global infrastructure and development firm. Through our association with Louis Berger, we have access to a resource base of 6,000 employees in more than 50 countries, and we're able to respond to local conditions while providing clients with the technical resources and rapid response capabilities of a leading global organization.



## 2015 Project Locations

- |                                  |                  |
|----------------------------------|------------------|
| Australia                        | Mexico           |
| Brazil                           | Mongolia         |
| Canada                           | New Caledonia    |
| Chile                            | Panama           |
| Democratic Republic of the Congo | Papua New Guinea |
| Ecuador                          | Peru             |
| Finland                          | Qatar            |
| Indonesia                        | USA              |
| Malaysia                         | United Kingdom   |
| Mauritania                       |                  |



## Offices





KCB is a private consulting firm with approximately 500 employees. Shares in the company are held by employees and a major shareholder, Louis Berger.

### Code of Conduct and Ethics for Subs

We developed a Code of Business Conduct and Ethics for subconsultants, subcontractors and suppliers and made it available on our website. By signing a KCB standard sub agreement, the sub acknowledges that they have read, understood and will follow the Code of Conduct.

KCB continues to be recognized for its commitment to best business practices. Highlights include:



7<sup>TH</sup>  
CONSECUTIVE YEAR



6<sup>TH</sup>  
CONSECUTIVE YEAR



7<sup>TH</sup>  
CONSECUTIVE YEAR



# Corporate Governance

## Executive Committees

KCB's Board of Directors is comprised of three members nominated by employee shareholders and three members nominated by Louis Berger. The Board appoints the President who in turn appoints the Operating Committee, an advisory group to the President which meets quarterly to review business unit budgets and performance.

## Business Conduct and Ethics

The success of KCB depends upon the integrity of its employees, the quality of its services, and on the trust and confidence of everyone with whom it deals. Within one week of joining the organization, employees must become familiar and comply with the Company Charter and complete our mandatory Code of Business Conduct and Ethics training program.

Violations of our Charter or Code of Conduct may be reported to our Ethics Officer who reports directly to the Board of Directors.



## Corporate Governance Committees

1. Operating Committee
2. Audit Committee
3. Risk Assessment Committee
4. Project and Proposal Monitoring Committee
5. Global Quality, Health & Safety and Environment (QHSE) Group
6. Pension Committee
7. Donations Committee



## Volunteer Committees

1. Joint Health and Safety Committee
2. Sustainability / Environmental Committees
3. Employee Engagement Committee
4. Women-in-Klohn Committees (Global and Regional)
5. Young Professionals Committees (Regional)



## Integrated Management System



Our business is governed using an integrated management system (IMS) consisting of Quality, Health and Safety, and Environment procedures. This system steers our business conduct, the manner in which we undertake our projects, and how we interact with our clients, the community and the environment.

Supported by KCB's management team, our IMS is implemented to ensure we comply with applicable legislative, regulatory and client requirements. KCB employees are expected to adhere to our IMS, and we reinforce this responsibility through leading by example, training, audits, and setting company objectives. We are committed to continually improving the effectiveness of our IMS in collaboration with our employees and clients.

Management review of our IMS includes the regular assessment of the following information:

- Client feedback and retention
- Employee survey results
- Audit, inspection and incident investigation results
- HSE performance statistics compiled quarterly and annually
- Monthly project and proposal monitoring reports
- Quarterly reports to the Operating Committee

### IMS Audits in 2015

24  
internal audits\*

10  
external audits

The Canadian Nuclear Safety Commission conducted an audit of our Radiation Safety Program

25  
office and field inspections

#### \* Internal audit scope:

- Systems management
- Project team qualifications
- Proposals and project planning
- Client management
- Sub management
- Project execution / management
- Checking and reviewing
- Project and proposal documentation
- Equipment control
- Hazard assessment and working safely



# our projects

ACEC BC  
Award of Merit

CN Rockshed



Grand  
Award for  
Excellence in  
Concrete Construction

Snoqualmie Falls  
Renovation  
Project



## Sustainable Infrastructure Design

In an on-going effort to incorporate sustainability in our project work, we have become an Envision Qualified Company. Envision was developed by the Institute for Sustainable Infrastructure, a non-profit organization founded by the American Council of Engineering Companies, the American Public Works Association and the American Society of Civil Engineers.

The Envision rating system is a project assessment and guidance tool for sustainable infrastructure design. It is an objective framework of criteria and performance achievements that helps users identify ways in which sustainable approaches can be used to plan, design, construct, and operate infrastructure projects.

The Envision rating system covers five categories:

1. Quality of life
2. Leadership
3. Resource allocation
4. Natural world
5. Climate and risk

## Towards Sustainable Mining

Participation in the Towards Sustainable Mining (TSM) program is a membership requirement of the Mining Association of Canada (MAC). Members with mining facilities commit to a set of guiding principles and report their progress publically in an annual TSM Progress Report. These progress reports are externally verified every three years by approved Verification Service Providers (VSP) for transparency, and to build the public's confidence in mining operations.

KCB now has an in-house VSP to assist mine operators with the verification process. Our understanding of mining stems from years of experience with over 300 mining projects worldwide. Our VSP and support

team are also experienced Environmental Management Systems auditors, who have held senior environmental roles in the mining industry, and have a thorough knowledge of international and Canadian mining standards.

KCB has been involved with MAC for many years, recently contributing to their Tailings Guidelines, and currently represented on the Environment and Science Committee.

The six TSM assessment protocols are:

1. Aboriginal and community outreach
2. Energy and GHG emissions management
3. Tailings management
4. Biodiversity conservation management
5. Safety and health
6. Crisis management planning





# Sustainable Project Attributes

In addition to the quantitative data collected for this report, we will share qualitative information through case studies where we played a significant role in sustainable practices. To focus our efforts, we developed a set of Sustainable Project Attributes. They include:

## Environmental

- E1 Responsible water management
- E2 Special consideration for flora / fauna
- E3 Rehabilitation beyond industry standard

## Social

- S1 Mentoring local people
- S2 Design / service to improve social conditions
- S3 Transfer of technology or skills
- S4 First Nations integration and application of traditional knowledge

## Innovation

- I1 Advancement in research and technology

## Design

- D1 Responsible land use
- D2 Designs to reduce, repurpose / reutilize remaining materials
- D3 Design to improve safety conditions







# Geotechnical Investigation of the Mount Polley Dam Failure

On August 4, 2014, the tailings impoundment at the Mount Polley Mine breached, resulting in the release of an estimated 17 million m<sup>3</sup> of water and 8 million m<sup>3</sup> of tailings solids into Polley Lake, Hazeltine Creek and Quesnel Lake.

records, and to characterize the geotechnical properties of the foundation soils and dam fill materials. This work included six months of field and laboratory studies, and a comprehensive review of design, construction and operational records.

The Mount Polley mine site is located 11 km from the town of Likely in the interior of British Columbia. Tailings are retained by a U-shaped dam abutting a natural slope on the northwest side. The tailings dam comprises three embankments: the Main Embankment on the southeast side, the South Embankment bounding the southwest side and the Perimeter Embankment bounding the northeast side. The dam failed at the highest section of the Perimeter Embankment.



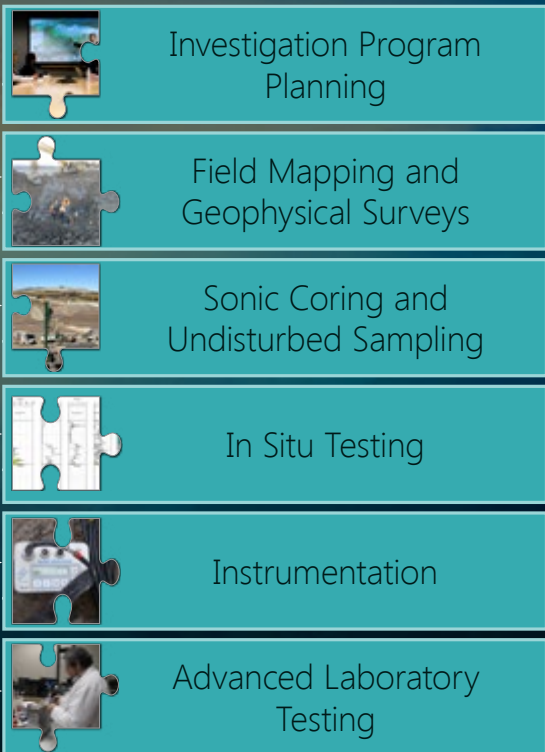
Geo-forensic fieldwork took six months and included over 1,000 soil index property tests

The results of KCB's work provided the definitive basis for understanding the geology of the dam site and, ultimately, how the dam failed by sliding on a thin layer of glaciolacustrine clay at a depth of 10 m below the dam. The investigative study methods and determination of the failure mechanism will be an essential reference for

the future design of tailings facilities, not only in British Columbia, but across Canada and worldwide.

**Sustainable Project Attributes**

- S2 Design / service to improve social conditions
- D3 Design to improve safety conditions



KCB was retained by the Ministry of Energy and Mines (MEM) to support their inquiry into the dam breach. As part of this work, we conducted forensic geotechnical investigations to gather the necessary factual data to support the technical assessment of the failure. Definition of the failure mechanism was an important step in MEM's subsequent evaluation of the root causes leading to the failure event.

## Identifying the Failure Mechanism

KCB planned and executed a detailed sequence of geotechnical investigations and studies to determine the geology of the soils and bedrock below the dam, to reconstruct the pre-failure section of the dam based on construction

## Social / Environmental Benefits

The mining industry has been recently impacted by the high profile failures of tailings dams around the world. Each failure has threatened public safety, impacted the environment, and diminished the economic livelihood of both the affected community and the mining companies involved. Critically, these events have eroded the social license of mining as a sustainable industry, and meaningful steps must be taken to prevent future failures in order to re-establish the confidence of the public, our governments and all stakeholders in the mining industry.

In order to change and improve practices for safely managing mine tailings, it is essential that each dam failure is studied exhaustively so that the failure mechanism is clearly defined and the engineering profession, mine operators and regulatory bodies can apply the findings and lessons to the design, operation and maintenance of tailings facilities. This was the clear goal and achievement of KCB's investigation studies.







# Anaham Meadows

## Drainage Rehabilitation

Anaham Meadows is located approximately 10 km north of Alexis Creek on the plateau of the Chilcotin River valley in British Columbia. The meadows consist of approximately 300 hectares of flat, low-lying land on either side of Anaham Creek, and has been an important agricultural area for the Tl'etinqox community for over 100 years.

Irrigation is a necessity for crop and livestock production due to the dry climate of the Anaham Reserve area. In 1963, a series of drainage structures were built to facilitate seasonal flooding and draining of Anaham Meadows. Over time the system deteriorated, and a series of ad hoc modifications to keep the system functioning ultimately damaged Anaham Creek.

KCB was engaged by the Tl'etinqox Government to restore the functionality of an aging irrigation system on a culturally significant site with unique environmental conditions.

The primary objective of the project was to design and repair the irrigation system using as much of the existing structures as possible, to avoid costly demolition and rebuild, and to reduce new concrete and other potentially hazardous materials from being used in this mainly instream work. To this end:

- The existing concrete was assessed to determine its condition and the repaired structures remained in place.
- The new walkways were pre-manufactured to avoid welding, drilling, and application of corrosive coatings on site.
- Cast in place (CIP) concrete was minimized by using gabion walls and mats, riprap and lock blocks for erosion protection and structural support. The only CIP concrete used for the project was a reinforced slab to strengthen the existing apron at the lower dam, and grout to repair the existing structures.

Our focus on integrating environmental, social and engineering considerations from project scoping through to commissioning provided the following beneficial effects:

### Economic Security

Restoration of the irrigation system will allow the Tl'etinqox community to continue producing crops and livestock in a safe and efficient manner, which will provide long term economic benefits to the community. In the short term, the Tl'etinqox Government and local businesses also received economic benefit from the creation of jobs, purchase of construction materials and use of local equipment to complete the works.

### Environmental Considerations

The impact of agricultural activities on Anaham Creek is lessened by the construction of fish salvage pools and the development of a fish salvage plan. Involvement of Tl'etinqox Government employees in construction of the pools and the fish salvage process allowed KCB to incorporate traditional knowledge into management plans and educate community members.

### Safety by Design

The safety of irrigation system operators and landholders will be improved with the new design. The addition of walkways and gates to control flows through the upper and lower dams will make access easier and safer. The new gate system will be much easier to use than the former stoplog system, which will provide operators greater water management control.

### Capacity Building

Consultation and collaboration with the Tl'etinqox Government allowed workers to be trained in the areas of earthworks, construction and environmental management. This training, combined with infrastructure improvements, will allow landholders and system operators to have safe and consistent access to irrigation water.

#### Sustainable Project Attributes

- E1 Responsible water management
- E2 Special consideration for flora / fauna
- S1 Mentoring local people
- S2 Design / service to improve social conditions
- S3 Transfer of technology or skills
- S4 First Nations integration and application of traditional knowledge
- D1 Responsible land use
- D2 Designs to reduce, repurpose / reuse remaining materials
- D3 Design to improve safety conditions

*"The Anaham Meadows are an important agricultural area for our community, and protection of the environment is paramount to the Tl'etinqox people. In the past our ranchers have had to use a difficult and poorly maintained irrigation system to produce hay, which resulted in damage to fish habitat and land. By considering the needs of all system users, Klohn Crippen Berger was able to come up with innovative and practical solutions that will help improve our land management practices for many years to come. The new dams are a great example of a high-tech but user-friendly system that will give the ranchers the control they need to continue being strong agricultural producers while ensuring that fish habitat is improved and maintained to a high standard."*

Chief Joe Alphonse,  
Tl'etinqox Tribal Chairman



# Parkdale Plaza



KCB was retained by the City of Calgary's Water Resources department (City) to complete the Stormwater Outfalls Upgrade project. This project required the design and construction of rehabilitation and backflow prevention works for more than 40 stormwater outfalls located in Calgary, along the Bow and Elbow Rivers.

During the preliminary design phase of the project, one of the outfalls located in the community of Parkdale, was selected by the City for a public art installation along the Memorial Drive Landscape of Memory corridor. The Landscape of Memory corridor is a living memorial to the events and people who have shaped the City of Calgary's landscape.

- Creating a public gathering place for the neighbourhood and regional pathway users; and
- Promoting social, environmental, and economical responsibility.

Brian Tolle's sculpture titled "Outflow" is intended to represent an inverted mountain range and was designed to replace a segment of the existing stormwater network visible to the public. The intent is to educate the public about the infrastructure buried beneath their City.

## Technical Complexity

Brian struggled to find a suitable construction material for his installation. The solution was to use Ductal, a high-performance concrete which is stronger and more ductile than conventional concrete.

Engineering considerations included rehabilitating the existing stormwater outfall infrastructure, designing a subsurface structure to support the sculpture walls, and adding a backflow prevention device to allow the City to maintain and clean the sculpture.

The Parkdale Plaza project, which opened to the public on June 27, 2015, was a successful collaboration between the City, artist, engineers, architects, landscapers and the community. Through this collaboration, a functional stormwater outflow was transformed into an interactive sculpture through the use of sound engineering methods, unique materials and creative design.

### Sustainable Project Attributes

- E1 Responsible water management
- S2 Design / service to improve social conditions

## Integrating Art and Engineering

The art project, known as the Parkdale Plaza project, is a public plaza featuring an art sculpture by internationally-acclaimed artist Brian Tolle. The Marc Boutin Architectural Collaborative Inc. (MBAC) as lead consultant of the Parkdale Plaza project, brought together stakeholders to develop the vision for The Landscape of Memory. KCB was the prime consultant for the Stormwater Outfall Upgrades project, and worked with MBAC to complete the design and construction of the Parkdale Plaza project.

The objectives of Parkdale Plaza included:

- Supporting the vision of the City of Calgary Parks Memorial Drive Landscape of Memory Plan;
- Creating an opportunity to allow the community to connect to the river and its watershed;

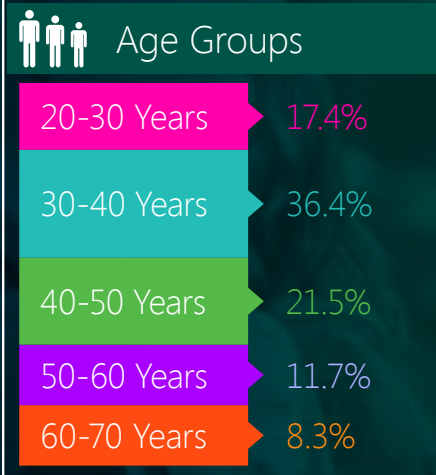






# our people

average age is **40.7** years  
average years of service is **6.6** years

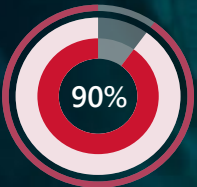


**Staff Count**

	Full Time	Casual / Part Time	Total
Canada	356	31	<b>387</b>
Australia	30	2	<b>32</b>
Peru	44	6	<b>50</b>
<b>Total</b>	<b>430</b>	<b>39</b>	<b>469</b>

**Gender Statistics**

	Headcount	Females	Males
<b>2015</b>	469	34.3%	65.7%
<b>2014</b>	497	35.6%	64.4%
<b>2013</b>	496	35.6%	64.4%
<b>2012</b>	524	31.4%	68.6%
<b>2011</b>	490	30.1%	69.9%
<b>2010</b>	407	27.0%	73.0%



90% of women return to work at KCB after parental leave

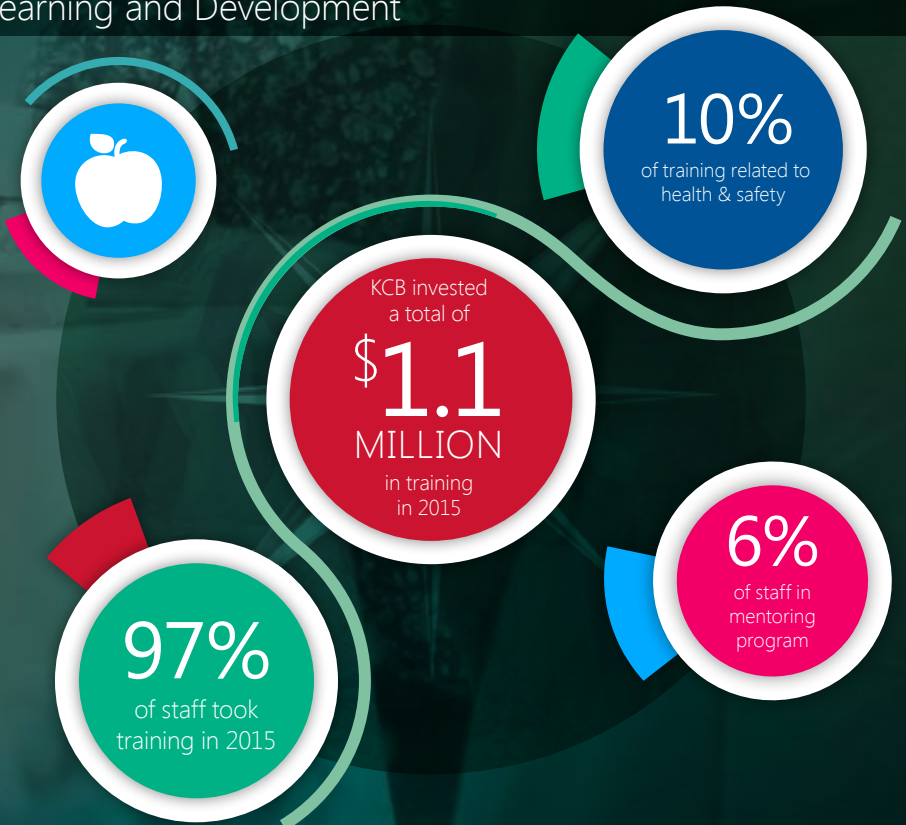


100% of men return to work at KCB after parental leave

## Learning and Development

OVER **200** subconsultants & subcontractors WERE EMPLOYED IN 2015

**\$15M** PAID OUT IN SERVICES





## KCB named an Employer of Choice



We were pleased to be named an Employer of Choice at The Australian Business Awards 2015. The Employer of Choice Award is given to organizations that maximize the full potential of their workforce through effective employee recruitment, engagement and retention.

*"We are honoured to be recognized as an Employer of Choice. An on-going commitment to best practices is key to our success,"* commented Chris Dickinson, Vice President, Australasia, Klohn Crippen Berger. *"The cyclical nature of the resource sector is a challenging one and we have worked with many talented professionals over the years that have risen to challenge."*

## Assessing Future Growth Through Research

KCB was invited by the Association of Consulting Engineers of British Columbia (ACEC-BC) to participate in the Asia Pacific Gateway Skills Table - a workforce research study to assess BC's employment needs for the next several decades. Following this, we were asked to participate in another research study to assess how companies are addressing the loss of senior personnel, and how they are planning to transfer technical and institutional knowledge. The report entitled "Management Attrition and Critical Knowledge Transfer" will be a critical resource for companies dealing with the loss of senior talent through retirement and other factors.

We also participated in Mercer's 2016 When Women Thrive study. This is the world's most comprehensive report on women in the workforce, representing nearly 600 organizations and 3.2 million employees.

## Emerging Leader of the Year

KCB's Alberta group launched a new initiative in 2014, the annual "Emerging Leader of the Year Award", to recognize rising stars who exhibit strong leadership.

The award criteria includes:

- An employee working as an engineer, technologist or scientist, who is a member of their professional or technical association, with less than 10 years of experience;
- Employment with KCB for a minimum of 1 year;
- Someone who is a role model for others in their profession by showing leadership, teamwork and creativity; and
- Someone who is a role model for others at work and in the community.

## MEG's Principal Awards

For the ninth year in a row, KCB's Mining Environmental Group has presented recipients with awards for excellence in People, Technical, Client and Business Excellence categories. The recipients are chosen from a number of regional offices.

## Women-in-Klohn Group Receives Champion Award



On April 16, 2016, the Association of Professional Engineers and Geoscientists of Alberta (APEGA) awarded the Calgary Women-in-Klohn (CWIK) group with APEGA's Women in Engineering and Geoscience Champion Award.

The CWiK committee routinely organizes events for staff focusing on mentoring and coaching, leadership development, skill advancement, and relationship building.

The committee has been influential in implementing changes to company policies for the benefit of all employees. Members of the CWiK committee together with KCB's global Women-in-Klohn committee suggested changes to the sick-leave policy, by allowing employees to use a portion of their sick-leave benefit to accompany family members to medical appointments, or to care for them when they are sick.

In 2015, the CWiK committee broadened into outreach programming. The committee became involved in Operation Minerva, a one-day job-shadowing opportunity for grade-eight girls in Calgary to visit female mentors and employers in Science Technology Engineering and Mathematics (STEM) fields.

KCB named seven new associates in 2015, three of whom are women







# health and safety

Our Health and Safety system has continually improved since its inception. Updates to the system are triggered by legislative changes, business needs and employee feedback, received through suggestions for improvement, annual surveys, audits and inspections. Furthermore, our system policies, manuals, procedures and forms improved as a result of our registration to OHSAS 18001.

## KlohnSafe for Supervisors

One of our goals in 2015 was to improve our safety culture through leadership training. We launched the KlohnSafe for Supervisors program consisting of three video modules. In 2015, 78 supervisors and managers completed the program.



Building a Strong Safety Culture Through Leadership



Roles, Responsibilities and Legal Requirements



Managing People With Safety in Mind



## Simplifying our System

In 2015, KCB's Global QHSE team, consisting of representatives from each Business Unit and location, worked together to simplify the system and further the integration of our QMS and HSE systems by:

- Adopting the QMS structure for our integrated QHSE System – our hierarchy of documents from policies, manuals, procedures to forms;
- Removing duplication and inconsistencies between documents;
- Streamlining and reducing forms to prepare for electronic forms and automated workflows; and
- Providing training to staff on system updates.

We improved the language in our documents to reinforce the purpose of our health and safety system by:

- Renewing our focus to prepare everyone at KCB to work safely – in the field, office or laboratory;
- Reinforcing our expectation that everyone in the company is a safety leader; and
- Reminding staff that our health and safety program is about identifying, assessing and mitigating hazards in the workplace.



**BCCSA** BC Construction Safety Alliance



We completed and passed the external audit for the BC Certificate of Recognition (COR) health and safety program, issued by the British Columbia Construction Safety Alliance (BCCSA). Our score was 91% (the passing grade is 80%). We have been COR-certified in Alberta and Saskatchewan for several years in order to qualify for work with our clients, and now we can proudly say we are COR-certified in BC too.





## KCB Named a National Safety Awards Finalist in Australia

KCB was named one of the top four finalists in the “Best Continuous Improvement of a Workplace Health and Safety Management System” category.

The National Safety Council of Australia Foundation National Safety Awards of Excellence is Australia’s longest running, independent awards program, recognizing outstanding work health and safety initiatives. Now in their 23<sup>RD</sup> year, Australia’s premier safety awards program continues to celebrate organizations and people who contribute to the health, safety and well-being of their employees and show continuous improvement in their business performance.

## HSE Performance Data for 2015

KCB promotes a proactive safety reporting culture where employees are encouraged to report safety observations, near misses and incidents. In learning from employees’ safety reports, we want to prevent minor and major incidents from happening in the first place, by improving our safety culture at work and at home.

We were pleased to see an increase in safety observations from 350 in 2014 to 560 in 2015. It’s important to note that the majority of minor losses reported in 2015 were driving incidents and in response we developed additional training to help improve our performance and safety on the road.

Safety observations improved in 2015 with 560 reports compared to 350 safety observations in 2014	Incidents in 2015 (excluding near misses) resulted in property damage (37 times), injuries (18 times) and illness (twice)	In 2015, we had one lost time incident and two medical aid injuries related to office activities	Incidents related to driving for work accounted for 41 of 96 (or 43%) of incidents in 2015
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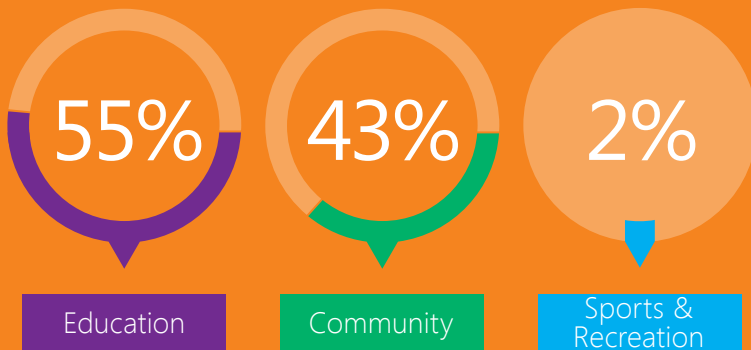
# our community

We are committed to giving back to the communities where we operate through charitable donations, scholarships and investment in research. KCB and its employees have a long-term affiliation with several charitable groups including the United Way, BC Children's Hospital, Adopt-A-Family programs, Australia's Morning Tea and the Calgary Corporate Challenge.

**United Way**  
STAFF RAISED \$36,242  
WITH KCB'S MATCH THAT'S A TOTAL OF **\$72,484**  
together we plant the seeds of change



Community investment by program category



## River and Pathway Clean Ups

Teams from Edmonton and Calgary participate in pathway and river clean ups every year. These annual events help clean up the city's pathways and river banks, while promoting environmental stewardship among its citizens.

## Stewardship of an Urban Creek

In Vancouver, staff have volunteered as stewards of Still Creek for the last three years. Still Creek is an urban creek running through Vancouver and Burnaby's industrialized areas, just a few blocks from KCB's head office. The work of volunteers resulted in the return of chum salmon to Still Creek in 2011, after an 80 year absence.



## Brisbane Staff Shows Support for Men's Health Issues

In 2015, KCB sponsored the Beyond Blue initiative – Australia's national depression awareness campaign and the Men's Health -Queensland sports competition. Sponsoring these events was a great opportunity to raise awareness of mental and physical health issues, and highlighting men's health issues that go undiagnosed or are ignored.



## Support for the Mustard Seed Community Support Centre

The Mustard Seed Community Support Centre provides support to adults experiencing poverty and homelessness by helping them with their basic needs and steering them towards a sustainable life change. In February 2015, a kindhearted group from the Edmonton office spent the evening making and serving dinner for over 200 cold and hungry people. The team enjoyed the experience so much they volunteered at the Mustard Seed later in the year.



## Childcare Centre in Huachipa-Nievería, Lima

Several employees of our office in Lima, Peru supported a local childcare centre in a Lima suburb known for its extreme poverty. The childcare centre was established to care for local children aged four and five, who had been joining their parents to work on farms and at brick factories. Initially our staff provided toys for the neediest children, but they wanted to do more. KCB donated funds to help build a new classroom and open up the childcare centre to three year olds. The funds are also being used to purchase a playground for the garden, so the children have a safe place to play.





## Supporting Innovation



### Funding of the Sustainable Minerals Institute

In 2015, KCB entered into a multi-year agreement with the Environment Centre of the Sustainable Minerals Institute (SMI) to advance our understanding of the long-term behavior of mine tailings.

Researchers Dr. Thomas Baumgartl and Dr. Mansour Edraki will lead the work, which focuses on assessing the impact of repeated wetting-drying cycles on the aging of mine tailings.

In finalizing our agreement, Dr. Baumgartl said there is a lack of knowledge on the impact of aging tailings on the water and geochemical balance of tailings storage facilities. He indicated a need for research to quantify the hydrological, geomechanical and geochemical characteristics of mine tailings, while taking into account the influence of tailings consolidation and weathering effects as tailings age.

*"The SMI is very pleased to be working with KCB on this very relevant and important research topic and the opportunity this provides as the first step in a long and mutually-beneficial relationship,"* said Professor David Mulligan, SMI Director of Environment Centre.

*"The research we are undertaking here will lead to a better understanding in the industry of the long-term behaviour of tailings and how to manage such a crucial part of the mining process through the mine life cycle,"* said Len Murray, KCB's President and CEO.

We support research and innovation to advance technology and methodology in our field of work. Highlights include:

- Queens University: \$40,000 over three years for a study of liner design for tailings impoundments. The research is complete and we are working on publishing the results.
- JM Konrad NSERC Partnership (Laval University): \$75,000 over five years with a completion date of 2018, to support research on life cycle optimization of embankment dams.
- CMC Research Institute, Field Research Station: \$50,000 per year for up to four years, for developing and improving technologies for the safe underground storage of CO<sub>2</sub> and other materials.
- Queensland University of Technology: \$30,000 per year, starting in 2015 for research related to the aging of tailings.
- University of California, Davis, Civil and Environmental Engineering Department: \$15,000 to the Mariam and Izzat M. Idriss Endowed Fund for Geotechnical Engineering Education.



### Sponsor of the APEGBC Games

KCB was proud to sponsor and volunteer at the Science Games again in 2015, an interschool event organized by the Association of Professional Engineers and Geoscientists of British Columbia (APEGBC) as part of National Engineering and Geoscience Month. Teams of students from Grade 1 - 6 explored the principles and theories of science first hand at the APEGBC Science Games, held at Science World in Vancouver, BC.

### The Sheri Plewes Scholarship for Women

The APEGBC Foundation has established a scholarship in memory of the late Sheri Plewes. Sheri was a respected member of the engineering community and a leader in the municipal and transportation engineering sectors. As such, KCB is proud and honored to be a contributor to the scholarship created in her name specifically to support young women entering the engineering profession.





## Our Professional Community

### Association Involvement

Canadian Water Resource Association – Chuck Slack, Director Alberta Branch

Association of Consulting Engineers of Canada – Shane Johnson, Board of Directors

International Mine Water Association – Len Murray, Associate Editor for Mine Water and Environment Magazine

Mining Association of Canada

- Bill Chin – Workshop Volunteer
- Howard Plewes – Tailings Committee Member
- Lindsay Robertson – Environment Committee Member

International Association of Hydrogeologists – Canadian National Chapter – Tim Ezzy, Board Member

Canadian Dam Association – Greg Noack, Board of Directors

International Commission of Large Dams – Harvey McLeod, Canadian Representative and Chairman of Tailings Subcommittee

International Committee for the Canadian Dam Association – Harvey McLeod, Member

### Staff Papers

Dick, W. and A. Ghavasieh. "A 24-h Design Storm for the Fort McMurray Region," Canadian Journal of Civil Engineering 42, no. 10 (2015): 747-755.

Bayliss, A. 2015. "Characterization of Glacial Tills from an Excavation Near Fort McMurray, Alberta," Proceedings of the 68th Canadian Geotechnical Conference and 7th Canadian Permafrost Conference, GeoQuebec 2015, "Challenges from North to South", September 20 - 23, 2015, Quebec City, Quebec.

Landers, M. and B. Usher. 2015. "Management of Spontaneous Combustion for Metalliferous Mines," Proceedings of the 10th International Conference on Acid Rock Drainage and IMWA Annual Conference, April 20-25, 2015, Santiago, Chile.

Tuff, J., B. Harrison, S.Y. Choy, R. Strand, B. Usher. 2015. "Assessing the Robustness of Antamina's Site Wide Water Quality Model over 5 Years of Implementation," in: 10th International Conference on Acid Rock Drainage and IMWA Annual Conference, April 20-25, 2015, Santiago, Chile.

Cross, R.A. and A. Port. 2015. "Geotechnical Seismic Assessment of a Pile Supported Wharf and Implications for Future Upgrades," Proceedings of the 11th Canadian Conference on Earthquake Engineering (11CCEE), Canadian Association of Earthquake Engineering, July 22-24, Victoria, BC.

Thavaraj, T. and A. Sy. 2015. "Low Probability Ground Motions for a Proposed Dam Site in Northeastern BC," Proceedings of the 11th Canadian Conference on Earthquake Engineering (11CCEE), Canadian Association of Earthquake Engineering, July 22-24, Victoria, BC.

Sturzenegger, M., Tim Keegan, Ann Wen, David Willms, Doug Stead and Tom Edwards. 2015. "LiDAR and Discrete Fracture Network Modeling for Rockslide Characterization and Analysis." In Engineering Geology for Society and Territory – Volume 6, edited by G. Lollino et al. Switzerland: Springer International.

Parkinson, G., H. McLeod, G. Stevenson, A. Morrison, A. Dalpatram, K. Norlund, C. Pelletier, et al. 2015. "Snow, Rain and Ice – Management of Mine Area Glacial Water at the KSM Project," MineWater Solutions in Extreme Environments 2015, April 12-15, 2015, Vancouver, BC.

Dowdell, D.J., B.W. Hamersley, M. Bruneau and S. Tudor. 2015. "Tubular Eccentrically Braced Frames for the San Francisco Oakland Bay Bridge Temporary Works," Proceedings of the 11th Canadian Conference on Earthquake Engineering (11CCEE), Facing Seismic Risk, July 24-24, Victoria, British Columbia.

Hamersley, B., W. Wu and K. Mitchell. 2015. "Seismic Design of a Curved Steel Box Girder Bridge for the South Fraser Perimeter Road (SFPR)," Proceedings of the 11th Canadian Conference on Earthquake Engineering (11CCEE), Facing Seismic Risk, July 21-24, Victoria, BC.





### Encouraging Greener Choices at the Office

**You have the Power** - Our two largest offices held "You Have the Power" campaigns to raise awareness of wasteful habits that use electricity unnecessarily. This included monitor counts to see how many people left their computers on after business hours and light checks in empty meeting rooms.

### Encouraging Greener Choices at Home

Throughout the year, our environmental committees held information sessions to encourage greener choices in and out of the office.

Topics included:

- Sustainable Gardening
- How to reduce waste during the Christmas Season
- Power Smart changes you can make at home

## our offices

### Sustainable Purchasing Guidelines

In 2015, the Global Sustainability Committee developed KCB's Sustainable Purchasing Guidelines.

Purchasing with sustainability in mind means that we consider the best value of a product or service, including the cost and quality of a good or service, and its environmental and social impacts. The guideline describes how to consider sustainability when purchasing goods or services for KCB, in line with our Sustainability Policy and Code of Business Conduct and Ethics.

Before purchasing on behalf of KCB, our offices are asked to first consider if the purchase is necessary and if the need for the product or service can be met another way. We also consider if we can use or refurbish existing materials or products, or if we can use in-house services. If a purchase is necessary, we consider:

- What is the product made of?
- How was it made or harvested?
- Who made it and how were they treated?
- How will it get here?
- How long will it last?
- How is it packaged?
- How will we dispose of it?

### The Intercontinental Commuter Challenge

Changing the way we commute is a great way to make a positive impact on our health and our environment. This was the second year of KCB's Intercontinental Commuter Challenge. After the success of the first year, a total of six offices participated in 2015. Overall 125 participants logged their alternative commuting choices during the challenge. This included transit, walking, cycling and carpooling. Not only did we recognize the staff already committed to alternative commuting choices, it inspired others to give alternative methods a try.

### Paperless Expense Reports

In 2014 we switched from paper to electronic expense reporting. During a full year of electronic reporting in 2015, employees submitted 3,572 expense reports for payment consisting of 19,291 expense items. In doing so, we have eliminated thousands of pages of paper from our operations, while streamlining the expense approvals and payment process.



# Energy Consumption (Electricity / Natural Gas)

Vancouver	2013	2014	2015 *
Number of People	207	206	216
Office area (ft <sup>2</sup> )	37,879	37,879	37,879
Electricity (kWh)	746,822	751,162	590,925
kWh / person / year	3,608	3,646	2,736
Natural Gas (GJ)	871	739	426
GJ / person / year	4	4	2

\* KCB is charged a portion of total consumption. In 2015, vacancies in our building reduced energy consumption at this location

Calgary	2013	2014	2015
Number of People	141	154	125
Office area (ft <sup>2</sup> )	31,409	31,409	31,409
Electricity (kWh)	401,520	409,752	403,262
kWh / person / year	2,848	2,661	3,226
Natural Gas (GJ)	1,706	1,636	1,627
GJ / person / year	12	11	13

Brisbane	2013	2014	2015
Number of People	Information Unavailable *	37	27
Office area (ft <sup>2</sup> )	Information Unavailable *	8,234	8,234
Electricity (kWh)	Information Unavailable *	134,920	127,164
kWh / person / year	Information Unavailable *	3,646	4,710
Natural Gas (GJ)	Not Applicable	Not Applicable	Not Applicable
GJ / person / year	Not Applicable	Not Applicable	Not Applicable

Sudbury	2013	2014	2015
Number of People	Information Unavailable *	19	20
Office area (ft <sup>2</sup> )	Information Unavailable *	7,226	7,226
Electricity (kWh)	Information Unavailable *	78,804	91,169
kWh / person / year	Information Unavailable *	4,147	4,558
Natural Gas (GJ)	Information Unavailable *	333	395
GJ / person / year	Information Unavailable *	18	20

Edmonton	2013	2014	2015
Number of People	Information Unavailable *	19	21
Office area (ft <sup>2</sup> )	Information Unavailable *	8,259	8,259
Electricity (kWh)	Information Unavailable *	43,979	40,746
kWh / person / year	Information Unavailable *	2,315	1,940
Natural Gas (GJ)	Information Unavailable *	Information Unavailable *	670
GJ / person / year	Information Unavailable *	Information Unavailable *	32

Lima	2013	2014	2015
Number of People	Information Unavailable *	47	53
Office area (ft <sup>2</sup> )	Information Unavailable *	6,350	6,350
Electricity (kWh)	Information Unavailable *	37,402	40,299
kWh / person / year	Information Unavailable *	769	760
Natural Gas (GJ)	Not Applicable	Not Applicable	Not Applicable
GJ / person / year	Not Applicable	Not Applicable	Not Applicable

\* we started to report on these offices in 2014



# Paper Consumption

Our paper consumption reflects standard printer paper; both 8.5 x 11 and 11 x 17, coloured paper is also included. The numbers of sheets are based on orders placed in 2015.

City	2013	2014	2015	
Vancouver	Sheets	1,193,000	1,005,500	875,000
	Sheets / Person	5,763	4,881	3,995
Calgary	Sheets	922,500	1,085,000	623,500
	Sheets / Person	6,543	7,045	4,988
Brisbane	Sheets	Information Unavailable *	131,165	105,300
	Sheets / Person	Information Unavailable *	3,545	3,900
Sudbury	Sheets	Information Unavailable *	78,000	96,000
	Sheets / Person	Information Unavailable *	4,105	4,800
Edmonton	Sheets	Information Unavailable *	90,000	72,500
	Sheets / Person	Information Unavailable *	4,737	3,452
Lima	Sheets	Information Unavailable *	176,900	150,250
	Sheets / Person	Information Unavailable *	3,767	2,835

\* we started to report on these offices in 2014

## Improving Our Purchasing Process

### Small Order Reduction - Vancouver Office

In October 2015, our Vancouver office reduced the frequency of placing stationery orders, from every week to every other week, to help lower greenhouse gas emissions, through reduced deliveries by truck and reduced paper consumption. Working in partnership with our supplier, Staples, we reduced our environmental footprint with this simple change in procedure.

	2014	2015
Orders	52	26
Fuel		
Kilometres driven (2.6km / order)	135	68
Litres of fuel (7.5km / L)	18	9
Paper		
Boxes	52	26
Corrugated cardboard weight (lbs)	83	42
Weight (lbs)	86	44
Environmental Avoidance Results		
Wood use (# of trees)	0.7	0.4
Greenhouse gas (tCO <sub>2</sub> )	0.04	0.02
Wastewater (gal)	300	155
Landfill space (yd <sup>3</sup> )	0.1	0.05
Oil (bbl)	0.1	0.05
Electricity (kWh)	181	93

Data provided by Staples Canada

## A Fresh Look at Recycling

The Alberta Group is now participating in a shredding program with *Best Shredding* who has partnered with the leading carbon management company in North America, *Offsetters*. This program provides us with a method to dispose of our confidential documents and track our paper consumption to learn about our impact on the environment. For every ton of paper shredded and recycled, 17 trees are saved and 5 cubic yards of landfill space are freed.



# G4 compliance matrix

G4 Content Index	Title	Page (s)
G4-1	Message from the President	1
G4-3 to G4-10	Organizational profile	5, 6, 7
G4-16	List memberships of associations in which the organization holds a position on the governance body, participates in committees	19
G4-18	Explain the process of defining the report and aspect boundaries	2
G4-19	List all the material aspects identified in the process for defining report content	2, 3
G4-24	List of stakeholder groups engaged by the organization	3
G4-26	Organization's approach to stakeholder engagement	3, 6, 7, 14, 15, 19
G4-28, & G4-31	Report profile	2
G4-34	Report the governance structure of the organization, including committees of the highest governance body. Identify any committees responsible for decision-making on economic, environmental and social impacts	6
G4-35	Process for delegating authority for economic, environmental and social topics from the highest governance body to senior executives and other employees	6
G4-56	Organization's values, principles, standards and norms of behavior such as codes of conduct and codes of ethics	3
G4-EN1	Materials used by weight and volume	22
G4-EN3	Energy consumption	21
G4-EN7	Initiatives to reduce energy consumption and reductions achieved	20
G4-A3	Return to work and retention rates after parental leave, by gender	13
G4-LA12	Percentage of employees per employee category	13

# KCB project attributes

	Category	Page (s)
environmental	E1 Responsible water management	11, 12
	E2 Special consideration for flora / fauna	11
	E3 Rehabilitation	Not profiled
social	S1 Mentoring local people	11
	S2 Design / service to improve social conditions	10, 11, 12
	S3 Transfer of technology	11
	S4 First Nations integration and application of Traditional Knowledge	11
innovation	I1 Advancement in research and technology	Not profiled
design	D1 Responsible land use	11
	D2 Designs to reduce, repurpose / reuse remaining materials	11
	D3 Design to improve safety conditions	10, 11





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building a better world

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