2018 Sustainable Development Report

GOLDER

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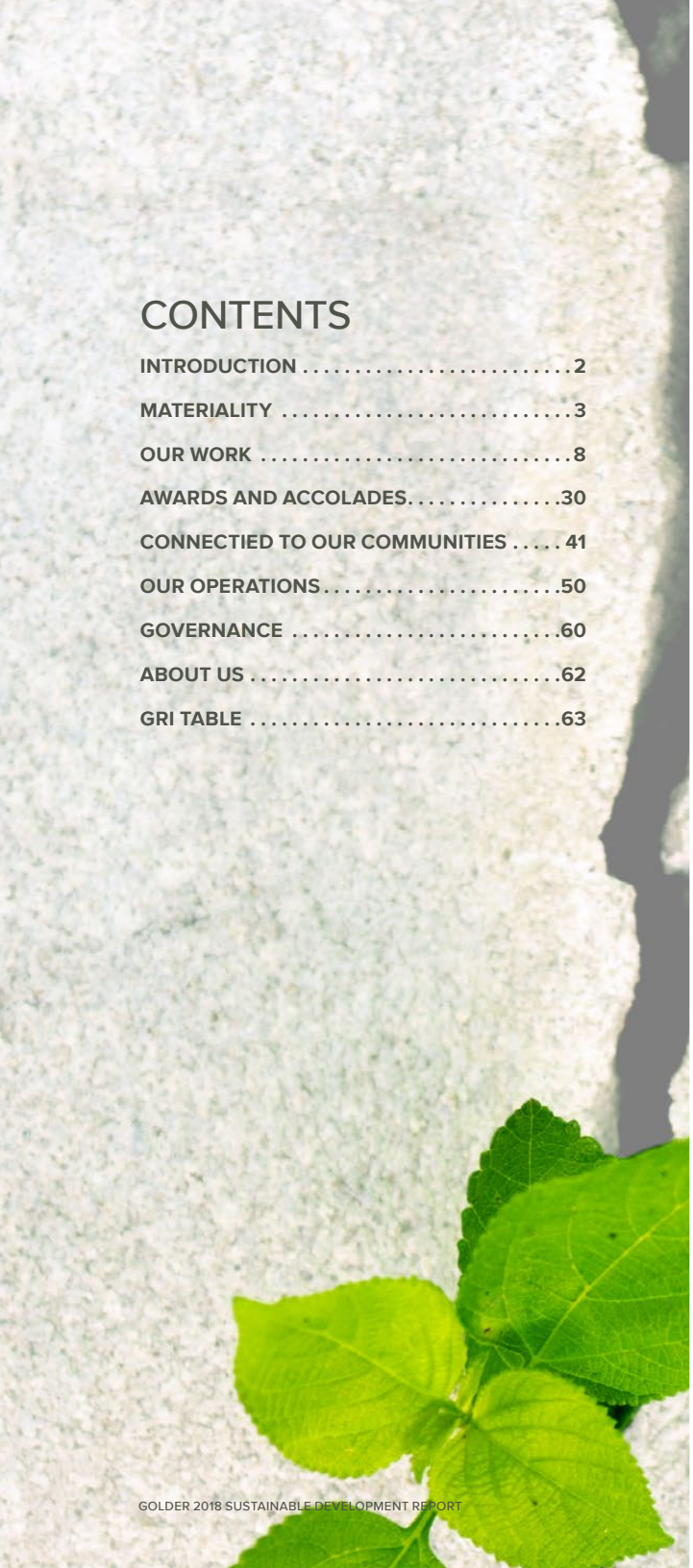


Introduction

We are pleased to introduce the 2018 Golder Sustainable Development Report and to share our efforts and progress. At Golder, sustainability is embedded in every aspect of our long-term strategy. Our objective is to deliver sustainable solutions and work with our clients to meet their sustainability goals while also reducing our impact on the environment resulting from operating our company.

Both our clients and our employees are excited to see sustainable development as a strategic priority of our company. Based on our materiality survey, over 65% of our clients are highly focused on sustainable development practices and 88% of our employees believe sustainability is a priority. With this, we have a strong foundation to execute our overall strategy for sustainable practices.

This 2018 Sustainable Development Report provides a wealth of inspiration. We are pleased to report that our safety and health performance has continued to improve, our carbon footprint shows steady reduction even with our increased headcount, and our community engagement is growing locally and globally driven by the commitment of our people.

Our project work has been outstanding, ranging from living artificial dykes to phytoremediation of pesticide-contaminated soils, and from waste re-use and carbon savings through to successful design and construction in environmentally sensitive areas, and our support of the mining sector with guidelines and standards to accelerate sustainable development and operations.

At Golder, we pride ourselves on having built a culture that thrives on challenges, and sustainability is one of the world's most critical challenges facing businesses and communities today. Even as we celebrate our progress, we must continue to view sustainability as an aspirational goal. Like an athlete always looking to improve their best performance, we must also operate under the belief we can always do better, do more, and exceed expectations.

MATERIALITY

Materiality: What our People Care About

Each year Golder conducts a survey of employees representing a cross section of our workforce and clients from the sectors we serve to check-in on the issues that define their views of sustainable development.

The results of the most recent materiality survey confirm that grassroots support for operating our business in a sustainable manner is unquestionable.

The results represented people from all our operating regions and at all career stages, ranging from members of the Executive Committee and Principals and Associates, through to Level 1 graduate recruits. Of those employees surveyed, 88% believe it is quite or extremely important, that Golder operates as an environmentally sustainable and socially responsible organization, minimizing waste, and the use of energy, water and other physical resources.

The results also demonstrated areas where Golder can improve, encourage, and promote waste minimization efforts by leveraging best practices from offices performing well in this area. We will work to determine what practical support can be provided to help our people raise the bar in our internal effort to reduce our environmental footprint building on the positive attitude our people have towards this issue.

"Our reputation and differentiation with our clients must start with our own commitments to operate sustainably and promote a mindset of long-term efficient and sustainable resource usage."

Golder employee, 2018 Materiality Survey.

MATERIALITY

Employee Perspective

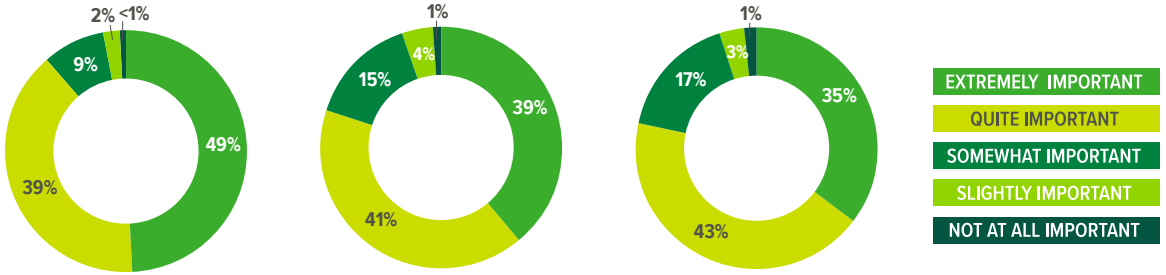
Which of these groups do you belong to?

Which operating group are you part of?

How important is it to you that Golder effectively minimizes waste (energy, water and physical resources) in all aspects of its operations?

How important is it to you to have an active waste minimization effort at the office level?

How important is it that Golder manages its supply chain?



Redmond Office

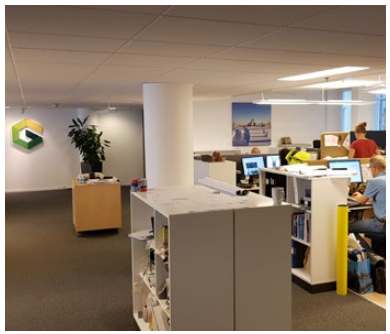
An Environmental and Sustainable Development Committee has been active in Golder's Redmond office (Washington, US) for almost a decade, improving internal procedures to reduce waste and energy consumption, promoting internal sustainability and environmental awareness, coordinating local community outreach events, and liaising with Golder's sustainable development technical community. Their efforts are impressive, having been recognized by King County each year since 2012 in the Best Workplace for Waste Prevention and Recycling award, reaching Honor Roll status in 2016 for receiving this award for five consecutive years. The League of American Bicyclists has endorsed the measures in place in Redmond to encourage cycling to work, granting Bicycle Friendly Business Bronze Certification for 2015 – 2019. The Redmond team has also celebrated and highlighted the intent of Earth Day for over a decade by volunteering and participating in various planting, removal, or restoration events. In 2018, the Committee gained the EnviroStars Green Business Certification for the Redmond office.

EARTHDAY.ORG

MATERIALITY

Golder Sweden – Sustainable Office Exemplar

Golder offices in Sweden have sourced their energy from 100% renewable sources and have recycled plastics, paper, cardboard, metal, glass, and toner cartridges for over 10 years. Employees have led this approach and these requirements are now embedded in the contractual arrangements with landlords as a matter of course in Sweden.



The Stockholm Office Lighting Motion Detectors

While Golder's Stockholm office was extensively renovated a decade ago and a number of improvements were made to minimize the environmental footprint, in recent years further action was taken to minimize our footprint. This included remodeling individual offices and replacing them with an open plan concept, designed to achieve a more effective use of space. Golder also collaborated with the builders to rebuild the existing lighting system (instead of replacing them) and install centralized motion detectors that can individually adjust light depending on motion and monitoring of lights from incoming sunlight and other sources, making sure we only use lighting when people are actively working in specific office areas. There is also a "main switch" so the last person to leave shuts off all lights.

The Swedish PHEV and BEV Charging Stations

Since 2007 the Swedish operation has systematically replaced company and office pool cars to those running on renewable energy instead of petrol and diesel. Today, 60 % of the cars in the fleet are plug-in hybrids (PHEV) and battery electric vehicles (BEV). The remainder run on BioEthanol, BioEthane and diesel (a legal requirement for vehicles in mines, tunnels and on some sites). Since 2018 all offices in Sweden have charging stations available.

Six of the 17 UNGC sustainable development goals have direct relevance to the way we operate our business.

Ensure healthy lives and promote well-being for all at all ages.

This speaks to our internal HSSE commitments and the programs and initiatives designed to continually improve HSSE outcomes.

Ensure incisive and equitable quality education and promote lifelong learning opportunities for all.

This links to our ongoing support for professional development and in-house learning opportunities, and our support for education through the Golder Trust for Orphans.

Achieve gender equality and empower all women and girls.

This connects to the diverse profile of our organization and our recognition of its inherent value.

Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all.

As an independent employee-owned company the future sustainability of Golder is an internal business imperative and is reflected in the attention of our Board.

Ensure sustainable consumption and production patterns.

Our actions to reduce waste and carbon demonstrate our commitment this goal.

Peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective and accountable and inclusive institutions at all levels.

This relates to our focus on anti-bribery and anti-corruption, and the effort made to educate our people about these issues and their prevention.

MATERIALITY

The primary impact Golder has on sustainable development is through the work we do for our clients, and what we can help them achieve.

Client Perspective

With thousands of clients across the mining, oil and gas, manufacturing, infrastructure, and power sectors who each have their own sustainable development goals, our contribution to sustainable development is substantial. This report serves as a snapshot of the scale and diversity of the innovative ways we help our clients achieve more sustainable project outcomes.

Two-thirds of our clients surveyed confirm that their organization is highly focused on sustainable development practices and initiatives, with more than half reporting that this focus has increased over the past 12 months. The main internal drivers of this position were community and shareholder expectations, and regulatory frameworks. All respondents strongly agreed or agreed that the quality of their projects was enhanced by including sustainable development measures.

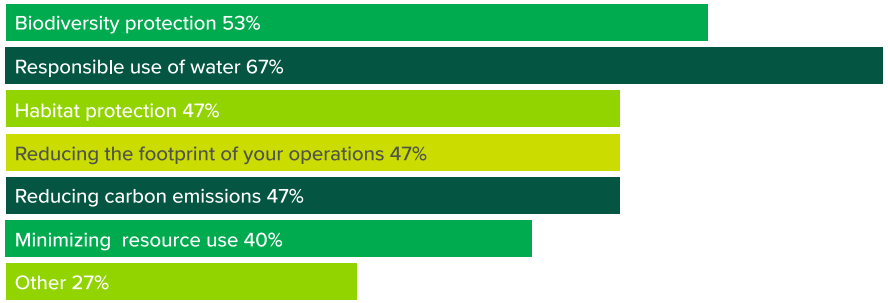
"As an international leading consultancy, Golder should lead and not follow. To that end, don't fall to politically correct/ trendy sustainability initiatives but pursue and champion programs, approaches and outcomes that make actual scientific difference for the environment and the communities impacted by the projects involved."

Golder client, 2018 Client Materiality Survey.

How would you describe your organization's focus on sustainable development practices and initiatives?

Has your organization's focus on sustainability changed over the last 12 months?

Which of these issues is most important to your sustainability efforts?



MATERIALITY

Client Perspective

Developing a Tool to Measure Environmental Impact

Ernströmgruppen, a private industrial conglomerate based in Sweden, is comprised of 25 individual companies focused on HVAC, energy, electro, and marine applications— none of which can be considered environmentally hazardous. Sustainability is a significant issue for Ernströmgruppen and since their business philosophy links value to generational continuity, environmental responsibility is of utmost importance. Ernströmgruppen identified a need to better understand and quantify its environmental impact and wanted to generate ideas about how to reduce its negative effects.

Golder sustainability professionals worked with Ernströmgruppen to develop a simple tool to classify medium-sized companies from an environmental awareness perspective. The "Ernströmgruppen Eco Screening Tool," launched in mid-2018, is the result of this work. While it is not intended to replace or compete with the major environmental certifications, it does provide a clear overview of environmental factors in business operations allowing for an increased awareness of where a company could focus their resources to improve environmental outcomes. Ernströmgruppen will also use the environmental classification to help evaluate future acquisitions.

In an intelligent and forward-thinking decision, Ernströmgruppen has made this tool freely available, asking only for feedback from users so that it might be further improved. It can be downloaded from www.ernstromgruppen.com.

Ake Eriksson, Associate and Senior Advisor, Kristina Wetterhorn, Environmental Consultant, Karolina Flemstrom, Group Manager Corporate Environmental Services and Risk, all from Golder Sweden worked with Ernströmgruppen to develop the assessment tool.

The following seven UNGC Sustainable Development Goals are most relevant to the work we do with our clients.

Affordable and Clean Energy: Ensure access to affordable, reliable, sustainable and modern energy for all.

Golder's work in clean energy spans the globe, see pages 24-27 for a snapshot of our contribution.

Industry, Innovation, and Infrastructure: Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation.

Golder's investment in innovation is outlined on page 28.

Sustainable Cities and Communities: Make cities and human settlements inclusive, safe, resilient and sustainable.

An urban renewal project in Copenhagen is detailed on page 13.

Responsible Consumption and Production: Ensure sustainable consumption and production patterns.

Golder's involvement in a circular economy project is detailed on page 32.

Take urgent action to combat Climate change and its impacts

A project to create living dykes to combat coastal degradation is detailed on page 9.

Life Below Water: Conserve and sustainably use the oceans, seas and marine resources for sustainable development.

A project to shift the paradigms in the decision making context for water quality management in South Africa is detailed on page 18.

Life on Land: Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss.

Preserving habitat is the focus of a project detailed on pages 17 and 23.

OUR WORK

In the past two years, we've seen some progress in action on climate change, as well as a fundamental shift in the thinking of many of our most prominent business leaders and institutions. Recently the American Business Roundtable released a new a set of purpose statements, one of which is "Supporting the communities in which we work. We respect the people in our communities and protect the environment by embracing sustainable practices across our business."

This focus on communities and the environment is a fundamental shift from the rationale that dominated the late 1990s. Today's business leaders are more focused on creating value for stakeholders through environmental stewardship – the new word for this change is coined 'inclusive capitalism'.

The primary impact Golder has on sustainable development is through the work we do for our clients, and what we can help them achieve. Those individual projects add up to a substantial contribution, because we work with thousands of clients across manufacturing, infrastructure, power, mining, and the oil and gas sectors, supporting each to achieve its own sustainable development goals.

Our consultants strive to create sustainable solutions. They value being part of an organization that is invested in a sustainable future. They also want to see Golder recognized as a provider of sustainable solutions to clients in the markets we serve.

If we, as individuals or organizations, can increase global awareness and translate awareness into action, we can make a difference.

Living Dykes to Stem the Impact of Changing Sea Levels

A living dyke has been designed for a client in British Columbia, Canada, to support sustainable coastal communities by creating more dynamic structures for flood protection. Living dykes are dune-beach systems that imitate nature and respond to changing sea levels, providing lower cost solutions to managing coastal flooding, the alternative often being to progressively increase the height of static or fixed dykes.

Living dykes are designed to move and self-heal in response to high water and waves, reacting to storm events so that the crest elevation of the highest point can rise as the dune is modified by storm activity. It mimics natural shorelines which have a long history of changing over time to meet changes in sea level, whereas a fixed dyke will either work or fail, but cannot re-heal if it fails.

The living dyke concept works on building defences out of materials that are mobile or can change over time (sands, gravel and dune grasses) as opposed to being built out of rocks which are static. The footprint of a living dyke provides an ecologically suitable surface that can be colonized with flora and fauna allowing decimated ecosystems to recover and thrive because the design builds habitat as well as protection.

While there are thousands of examples of these natural systems worldwide, artificial living dykes have been successfully created to stem the impact of storm activity on the Gulf Coast of the US, enabling the preservation and restoration of sea turtle nesting grounds. Living dykes are being trialled in the Low Countries of Europe (Denmark and The Netherlands) with restoration of coastal dune-marsh ecosystems to provide flood defences. This concept has not yet been applied in the Pacific Northwest; our design is being adapting to work in the northern waters.

Rowland Atkins, Principal and Senior Geomorphologist from our Victoria (Canada) office is the project director working with a team of coastal engineers and landscape architects to progress the design to the construction phase.

The image on the left shows an area subject to wave erosion and coastal flooding and on the right a design analog for a living dyke concept consisting of foredune and beach berm developed adjacent to and in response to a flood control outfall.

Investigating Air Quality - Developing a Model to Inform Future Growth

Many cities around the world are in economic transition, moving from reliance on heavy industrial and manufacturing industries to those that are immersed in creativity and knowledge, fostering the development of advanced technology, education and research.

The port-city of Hamilton (Canada), positioned on the western end of the vast Lake Ontario and well-known as a “Steel City” for its massive steelworks and accompanying industrial infrastructure, is in the midst of an economic transition of its own.

Over the past decade or so, Hamilton’s steel industry has transformed into high-tech industry with a dramatic reduction in its environmental footprint. As the city and its industries transition into a high-tech future, there is continuous pressure to improve the city’s air quality and an urgency to realize Hamilton’s vision to be the best place to raise a child and age successfully and improved air quality is an important part of Hamilton’s future.

In a forward-thinking decision, the City of Hamilton and the Hamilton Industrial Environmental Association jointly commissioned Golder to develop a model that will help the city to better plan its future. These efforts were supported by a steering committee comprising members from other stakeholders including Hamilton Health, regulatory agencies and environmental and citizen-based groups. Helping to address the complex question of air quality, Golder assisted Hamilton to develop the Hamilton Airshed Modelling System (HAMS).

The objective was to understand what contributes to Hamilton’s air quality to support the City to make decisions on urban growth including housing, transportation, and greenspace.

Elevated view of the city if Hamilton on the shore of Lake Ontario in Canada.

OUR WORK | PROJECT PROFILES

Until recently, information of a detailed, granular nature was simply unavailable. The data points measuring air quality were too few to build a reliable picture that could help point to sources of pollution. Computer-based models were not able to handle complexities such as the influence of topography and bodies of water, and the available computers had trouble crunching large data sets.

The increased speed of computers and the arrival of multi-processors has allowed these models to simulate conditions at a far more granular level. As an example, until recently, the entire City of Hamilton would have been modelled as one grid cell, now there are about 900 cells. More importantly, the science in the models has improved to allow the calculations to be completed at this deeper level.

Having reliable, comprehensive and detailed information on the diverse elements that affect air quality can help planners understand pollution sources, such as transportation routes including rail rights of way, highways, ports or airports. The City can plan development so that sources of pollution are less of a threat to residents and sensitive receptors, accumulating data that allows them to develop policies based on strong science, to underpin future growth. Further, with changes in climate, Hamilton can look into the future and simulate what conditions will be like.

Discussions have started with the City of Hamilton to simulate a number of “what if” scenarios. The modelling system will be updated every five years, including weather data, to reflect population changes as well as land use to ensure its currency as the City changes over time.

Anthony Ciccone, Principal and Vice President Infrastructure and Power from Golder’s Toronto (Canada) office and Jayna Kelly, Climate Change and Air Quality Specialist from the Mississauga (Canada) office, jointly developed the Hamilton Airshed Modelling System.

Clever Design Minimizes the Footprint of Landfill

Golder's expertise in geotechnical engineering and environmental science is delivering improvements in waste management for many clients worldwide.

In regional Queensland (Australia) a clever design, drawing upon Golder's expertise in geosynthetics and soft soils, has almost doubled the predicted life of a landfill. The majority of waste from the local Rockhampton community was disposed of at the Lakes Creek Road Landfill, a site that was fast approaching the approved regulatory capacity. The initial project brief from the client, the Rockhampton Regional Council, indicated a 20-year extension to the life of the landfill through vertical expansion. Following a review of the geotechnical data, Golder identified several risks, including the presence of very soft soils beneath the existing landfill footprint having the potential to significantly reduce landfill capacity, requiring further site investigations, testing and analysis of the subsurface materials.

Through innovative design, Golder was able to develop a geotechnical monitoring and waste filling program which extended the landfill site capacity to over 33 years. Golder's geotechnical skills and superior knowledge of soft soil engineering is a major factor in assessing the feasibility of the site, along with an advanced understanding of the use of geosynthetic materials. With the application of new liner materials, and using specific techniques to manage the soft soils, the vertical expansion of the landfill became a viable option.

Golder's design, which has been adopted by the Council, has resulted in considerable gains for the community and the environment. The use of vertical expansion with geosynthetic materials to significantly reduce leachates entering ground water is an improved outcome for the environment. The alternative to the vertical expansion was to transfer waste from Rockhampton to Gladstone, a city some 110km away by road, which would have been a significant impost for the local community. Substantially more truck movements on an already heavily utilised road would have increased the carbon footprint for the Council and the costs to ratepayers to cover long distance haulage. Council revenue from the landfill and jobs would have been lost. Instead, Council will gain around AU$250 million through gate fees over the life of the facility which can be used to fund and enhance other community services in the region.

Rockhampton landfill cell A under construction

Work commenced on construction of the vertical landfill expansion in early 2018. Nigel Ruxton, Associate and Design Group Leader from the Brisbane (Australia) office is the project manager and a Registered Professional Engineer of Queensland during the Construction phase. The landfill design team included Fred Gassner (project director), Krystle-Rae Biram, Sven Waurich, Morgan Midgley and Prathama Igor.

Urban Renewal in Suburban Copenhagen

The densely populated residential area of Brøndby Strand Parkerne near Copenhagen in Denmark is about to be transformed through a large-scale urban renewal project.

More than 4,000 people call the 3,200 apartments in Brøndby Strand Parkerne home. The dwellings, built in the late 1960s and early 1970s using prefabricated concrete elements, are decaying and an urban renewal plan is being developed by the cooperative housing societies who own the properties. Golder is the environmental consultant for the project which includes field studies, baseline studies, calculations and analysis of environmental impacts and various engineering services.

Golder's investigation of the indoor climate in the buildings revealed the presence of polychlorinated biphenyl (PCBs), an organic chlorine compound. Once widely used in building materials for their durability, we now know PCBs are harmful to human health. As a result, and part of the plan, about 10% of the total number of family dwellings will be demolished.

Our team will manage the demolition to minimize impacts on the environment and the use of resources. The project involves environmental investigations of the buildings and identification and quantification of hazardous materials in the building fabric, planning of demolition work taking into consideration the safety of people in the locale, surrounding buildings and infrastructure, some of which are located only eight meters away from the demolition site.

Preparation for the demolition started in early 2018 and demolition of the buildings is expected to commence in 2020. Golder will plan for the handling and management of hazardous materials, local traffic and logistical issues, and optimize recycling and reuse of materials. An Environmental Impact Assessment has been requested by the local municipality to cover the demolition exercise and future use of the site and this will be undertaken by Golder. The aim is to minimize the environmental impact of dust, noise and vibrations, and on ground water and biodiversity in the local area. Golder will make recommendations as to whether the site can be used as a public recreation area or if further action needs to be taken if new housing is to be built on site.

The social aspect of the renewal is also important given the impacts to the community and Golder will have input into the social impact studies. Demolishing these buildings will impact families, residents, and businesses. By 2025, it is expected that the dwellings considered environmentally inadequate will be gone and replaced with a combination of new accommodation and recreational spaces.

Niels Strufe, Environmental consultant from the Copenhagen (Denmark) office, is managing this project for Golder and is supported by many people in the local office who are contributing environmental, geotechnical and planning expertise.

Road Upgrade Preserves Historic Bridge for Community Use

The historic 128-year-old Chandler Highway Bridge over the Yarra River is one of the most notorious traffic bottlenecks in the inner suburbs of Melbourne, (Australia). Around 4,400 vehicles cross the two-lane bridge each day, including 200 heavy vehicles, coming off a major four-lane highway en-route to the suburbs. The existing heritage-listed 137-meter-long steel bridge was initially constructed as a rail crossing and later converted to use for vehicles as part of the Chandler Highway.

Earthworks on the banks of the Yarra River in suburban Melbourne (Australia)

The Chandler Highway Upgrade Project involves the construction of a new six lane, 200-meter-long bridge sitting alongside the existing heritage bridge, designed to alleviate the significant transport problem while at the same time improving the amenity of the location for the benefit of the surrounding community. The impact of the development on bridge users was a major challenge for this project, as was environmental protection of the river and its environs. Managing the environmental impacts to the existing landscape of the river, heritage bridge, and local community required a clever design and environmentally sustainable solutions.

Golder has been an integral part of the project team throughout the investigation, design, and now construction phases of the project, contributing our expertise as the principal geotechnical consultant to achieve the best outcome for the project. Now nearing completion, the bridge is designed to have a longer center span with staggered abutments and piers to avoid construction near the riverbank and disturbance to local habitat, which is home to a range of aquatic species including the notoriously shy platypus. Piles were bored instead of driven to reduce noise and vibration impact to residences in proximity, including a rehabilitation hospital and guide dog training center.

The original bridge has been converted into a walking and cycling shared use path linking existing routes along the river, including the elimination of a 70-step rise that gives users unimpeded access to other riverside routes, a significant benefit for people who use the pathways for recreation and to commute to and from the city.

The improved shared-use path network required a series of retaining walls, underpasses and elevated structures to achieve the project objective of maximum native vegetation and tree retention. A 'bioretention' system was also constructed with retaining walls for stormwater treatment prior to being discharged into the river. Overall, the project has been successfully executed with the environmental protection and management integrated in the design and construction.

Bing Lee, Principal Geotechnical Engineer, from the Melbourne (Australia) office was the Design Lead for the Chandler Highway Upgrade. Sri Srithar (Principal) was the Project Director, Andrew Russell (Associate) the Project Manager, and supported by Project Engineers Supun Mendis and Tom Dorrington.

Using Plants to Decontaminate Soil and Groundwater in Hawaii

In an award-winning project that commenced over two decades ago, Golder has helped property owner Del Monte Fresh Produce (Hawaii) Inc (DMFP) find a sustainable solution to a significant soil and groundwater contamination problem, helping to meet sustainability goals, reduce carbon impact, and save money.

Ethylene dibromide (EDB) and 1,2-dibromo-3-chloropropane (DBCP) had been widely used by the agricultural sector before being banned by the US Environment Protection Agency in the early 1980s. These compounds were applied as a soil fumigant to control destructive microscopic worm-like nematodes that attack crops such as pineapples, bananas and potatoes on a DMFP site in Oahu, Hawaii.

DMFP, a global producer of fruit and vegetables and an organization committed to sustainability, wanted to remediate soil and groundwater impacted by EDB and DBCP on this site. An initial remediation proposal involved transporting contaminated soil by ship to mainland US for treatment as there was no approved treatment facility on Oahu. This option was both costly (a USD3.5 million exercise) and would create a high carbon footprint impact through transportation and incineration.

Golder was brought in by DMFP to work with them to find a better way to achieve their remediation objectives. The solution was to use living plants to remove contaminants from soil and groundwater. A tropical leguminous tree, Koa Haole, was selected as a phytoremediation agent. The year-round growing conditions, and the availability of this tree on Oahu, made it a particularly attractive option to pursue, and one that ultimately saved DMFP around US$2.5M by negating the cost of transportation of contaminated soil to the US mainland.

While phytoremediation is a well-established technology, this project broke new ground due to the type of contaminants being remediated. Phytoremediation has often been used to deal with various organic compounds and metals, its application on EDB and DBCP was not proven and was an innovative use of this technique.

Testing by the University of Washington determined that Koa Haole could fully degrade EDB to bromide ion, and Golder worked with the property owner to develop a pilot-scale test site on location, starting in 1998.

Koa Haole is used as a phytoremediation agent for EDB and DBCP contamination.

OUR WORK | PROJECT PROFILES

The pilot-scale test ran for two years, proving the idea successful. The trees were found to be effective in remediating the contaminated soil and groundwater. Soil contaminant concentrations were reduced to be below residential standards, and leachate water below drinking water standards.

Based on the success of the pilot test and with the approval of the US Environmental Protection Agency (EPA), Golder and DMFP implemented a full-scale project which has now been in operation since 2008. Recent data indicates that this phytoremediation system has successfully treated over 18 million liters (4.7 million gallons) of groundwater to concentrations that were better than drinking water standards and more than 760 cubic meters (1000 cubic yards) of soil have been remediated.

With EDB and DBCP being in widespread use for decades to fight nematode infestations in many locations, finding a way to remediate soil and water impacted by these compounds efficiently and cost-effectively using phytoremediation will help to provide a sustainable remediation approach for other similar projects.

Golder and DMFP received the 2018 American Council of Engineering Companies (ACEC) of Washington's Best in State Gold Award for Uniqueness and/or Innovative Application of New or Existing Techniques for our work on this project.

Gary Zimmerman, Principal and Practice Team Leader from the Redmond (US) office has been working on the DMFP project since 1996 and been Project Manager since 2004. He is supported by Jeremy Clark, and Stacey Brionez.

Innovative CSG Project Design to Protect Vulnerable Species in Australia

In outback Australia, Golder has undertaken a comprehensive environmental impact assessment for a proposed Coal Seam Gas project in Queensland's Bowen Basin. The proposal includes the staged development of over 200 coal seam gas wells covering an area of some 700km^2, a project with a 40-year life span designed to produce up to 100 terajoules of gas per day for domestic and export LNG markets.

Our client's application for a petroleum lease requires such an assessment, the results of which have enabled sustainability principles to be incorporated into the feasibility design of the project infrastructure and allowing the client to carefully manage the unique environmental challenges in this part of Australia.

Multiple studies were required to assess possible impacts and devise the mitigation controls required to balance environmental, social and commercial outcomes for the client, involving ecology, surface and groundwater, stakeholder engagement, GIS, air and noise, and waste teams, over a 12-month period. Golder's assessment resulted in the identification of threatened ecological communities and two vulnerable species, the Koala and the Ornamental Snake.

Golder's work has culminated in an innovative blueprint of optimum well locations, gathering lines and other infrastructure that reduces the potential impacts of the project and protecting the environmental values identified through our research.

Mervyn Mason, Principal Ecologist, Daniel Potter, Senior Ecologist, James Comley, Principal Environmental Scientist, and Sarah Duarte, Senior Environmental Scientist, all from the Brisbane (Australia) office jointly led this work. Associate and Environment Team leader, Lochlan Gibson, was the project director.

Developing Risk-based Guidelines for Domestic Water Use in South Africa

South Africa is a water-stressed country. Less than a year ago Cape Town, a city of almost four million people, was weeks away from a water crisis that would see municipal supplies being switched off and residents queuing for a daily ration of water, possibly the first major city in the world to run out of water. Saved by strong winter rains, the water emergency highlighted the precarious nature of the water supply in that country, one that is subject to high variability in seasonal rainfall patterns and is unevenly distributed across the country. Increased urbanisation and a higher demand from both industrial and domestic users add to the severity of the problem. Several of the catchments within South Africa are under pressure both in terms of current supply not meeting demand and deteriorating water quality.

Ensuring acceptable water quality that is fit-for-use is as much of a priority as adequately managing water availability to meet water demands and supply requirements. Sustainable decisions on fitness for use in a complex, constantly changing environment of limited water resources requires sound technical guidance.

The 1996 South African Water Quality Guidelines have been used by water quality managers and water resource managers for more than two decades as a primary source of information to support decision-making regarding the fitness for use of water resources. While the guideline document reflects the scientific knowledge at the time it was produced, the scientific understanding of the complexity of water ecosystems and adaptive management processes have evolved leading to new approaches to managing water quality. A national review of water quality guidelines in South Africa undertaken in 2008 concluded that these guidelines should support site specificity and be risked-based, a departure from the prevailing approach where a predetermined water quality outcome was the defining factor in applying the guidelines. This often resulted in an assessment of fitness for use which was either too lenient or too stringent

Golder was appointed to assist the Water Research Commission to develop a new set of guidelines for domestic water use, a risk-based approach that provided an accurate assessment of fitness for use with respect to associated hazards and an acceptable risk framework that facilitates the sustainable use of water resources based on a site-specific approach. These risk-based water quality guidelines, which were developed over a two-year period in 2017 and 2018, are now being reviewed by the Commission represent a paradigm shift in the decision making context for water quality management and in how water quality guidelines are used and applied in South Africa underpinning sustainable water resource use.

Priya Moodley, Water Resource Scientist from the Johannesburg (South Africa) office was the Project Leader, supported by Lee Boyd (Water Resource Scientist, South Africa), Nirvishee Juggath (Water Resources Engineer, South Africa), Givarn Singh (Junior Water Resources Engineer, South Africa) and Trevor Coleman, Principal (South Africa) as the Project Director. Dr Bettina Genthe, CSIR, South Africa, also contributed to this project.

Leadership in Sustainability: Mine Closure and Mine Water Stewardship

Golder has a long history of working closely with the mining sector stemming from the very origins of our company in Canada nearly 60 years ago. Today our mining work spans the globe, supporting our clients' needs across the full lifecycle of a mining operation, from exploration and development, through operating years, and ultimately into closure and land rehabilitation.

Golder's technical support for our mining clients covers the entire spectrum of our services, with particular focus on mine waste and water management, tailings storage, mine stability and geotechnical issues, environmental issues, mine closure, and remediation. Our expertise is often called upon by mining industry organizations, like the International Council on Mining & Metals (ICMM) and by international non-government bodies like the International Organization for Standardization (ISO), who seek to inform and guide businesses with best practice principles and approaches.

Working with the ICMM

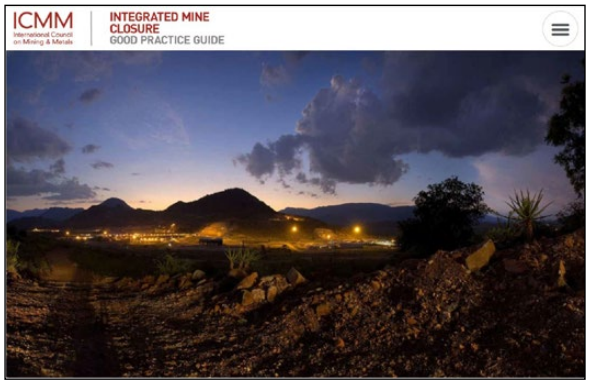
In 2018, Golder organized and facilitated a mine water stewardship workshop over a two-day period in London on behalf of the ICMM. The workshop focused on three key water sustainability issues facing stakeholders today:

- innovations in valuing water
- multi-stakeholder collaboration and novel partnerships, and
- alternative models for delivery and financing of water projects.

Participants engaged in cross-sector sharing and dialogue to dissect opportunities and constraints that underpin business decisions on water stewardship. More than 40 global mining, oil & gas, finance community, and NGO leaders attended the workshop, involving participants from our largest client organizations (Rio Tinto, BHP, Freeport, Anglo American, Teck, and NewmontGoldcorp). Scot Foster, Golder's Mining Client Program Director, and Mike Lelliott, Principal Hydrogeologist from our London office, led the creation and delivery of the ICMM workshop.

Mine Closure Toolkit

In 2007, the ICMM published a comprehensive and ground-breaking mine closure toolkit which was widely recognized and adopted by the mining community for its best practice approach. Some 10 years later, the ICMM called upon Golder to help update this guidance to ensure that it promotes standards and practices that have evolved and improved over this time in the areas of post closure land use and the social transition for mining operations and the impacts on communities. The updated document, finalized in 2018 and published in early 2019, provides a comprehensive approach to closure planning and management throughout the mining lifecycle.



Mine Closure Checklist for the APEC Mining Task Force

Through its Mining Task Force, the Asia Pacific Economic Cooperation (APEC), a 21-nation community, issued a mine closure checklist for the governments of member nations.

According to APEC some 70% of all mining output is produced and consumed in APEC member economies, resources that are vital to a wide range of industries including construction, transportation, digital infrastructure, food production and healthcare.

The pursuit of sustainable mining practices drives the policy agenda of the Mining Task Force. While the checklist is designed to support regulatory frameworks and bridge the gaps in the variability of practice across the region to support developing nations to meet economic goals, it is not meant to do so at the expense of other important sustainability measures.

https://www.apec.org/Publications/2018/03/Mine-Closure---Checklist-for-Governments

New Mining Standard for the International Standards Organization

Golder professionals are assisting the International Standards Organization to prepare a mine closure terminology standard. This is a new standard for the ISO and Golder has taken the role of international project leader, leading a committee through a complex process that must be relevant in multiple jurisdictions and local regulatory environments. The resulting terminology standards will apply to widely varied operating conditions, from the arctic to the deserts of northern Africa and the tropical climes of Indonesia. This piece of work commenced in 2013 and is expected to be published in 2020.

Preparing for a Post-mine Future

There are there are over 100 active and inactive mines in the remote and vast Pilbara region of northwest Australia, ranging from those controlled by multinationals to the smaller juniors. The Pilbara Development Commission has turned its attention to how these sites might be used productively at the end of their mine life with a long-term project focusing on a 50-year forward project.

Consideration for the future include regional development goals and economic diversification with possible uses including pastoral leases, irrigated agriculture, renewable power generation, tourism, and aquaculture in an area about the size of Spain.

We are helping the Commission to prepare a development framework that would support such activities, a process that involves multiple government agencies and balancing competing priorities to achieve workable solutions.

These projects exemplify the ongoing leadership role Golder plays on the global stage in helping our mining clients address their most complex sustainability challenges through a rare combination of technical excellence and business insight.

Reclaimed Mine Supports Species at Risk

In a long-abandoned mine in a remote location in northern Ontario, and important bat habitat for species-at-risk, Golder has designed an innovative solution that protects both people and wildlife from the dangers of abandoned mine hazards.

Silver mining at the historic Edison Mine property ceased in 1907 after a few years of operation, leaving eight unprotected physical mine hazards on site. To mitigate the risks associated with the abandoned facilities and support the bat habitat, Eaton Corporation, the mine owners, engaged Golder to find a solution to achieve both objectives.

The Ministry of Natural Resources and Forestry (MNRF) identified the underground mine workings as a potential refuge for bats and designated the mine workings as protected habitat for species-at-risk. A number of bat species are at-risk across Ontario due to white nose syndrome, and their habitats need protection to assist in their recovery. This classification required that the three physical mine hazards connected to the underground workings were to be preserved and left open, which meant existing rehabilitation practices could not be applied. Fencing the site was the most viable solution but would still require Eaton to monitor the site in perpetuity. A unique engineered rehabilitation solution for these three surface openings that prevented human entry to the hazards, but still allowed bat habitat to remain, was required. A further complicating factor was the logistical challenge of constructing these structures in a location only accessible by boat and helicopter.

Two permanent engineered bat cupolas and a bat gate were designed and constructed with reference to specific load requirements that account for the dead weight of structure, snow loading, tree impacts and vehicle traffic. Stainless steel was used for its longevity and rust resistant properties, and the cupolas have been anchored to bedrock. A further five standalone mine hazards were backfilled with locally sourced material.

The fabrication and installation of these structures was one of the first bat-friendly rehabilitation solutions to be constructed by a private enterprise in Ontario, successfully meeting regulatory requirements, protecting bat habitat and the public's safety by preventing inadvertent access into the underground mine workings.

Paul Palmer, Mine Engineering & Stability Division Leader from the Toronto (Canada) office was the Project Director, with Mine Closure Specialist Project, Josip Balaban from the Mississauga (Canada) office, Project Manager and Field Supervisor.

Bat refuge at the historic Edison Mine in northern Ontario, Canada

Reviewing Occupational Hygiene

Protecting employees from ill health that could be caused by their work environment is a core business requirement and one that directly relates to an organization's ability to sustain their workforce. Best practice in this area necessitates a process of continuous improvement and Golder has undertaken one such review for global gold producer Barrick Gold Corporation.

Over a 16-week period in 2018, Golder conducted a comprehensive occupational health and hygiene audit and gap analysis covering all facets of occupational health and hygiene for their 10 operated sites in Canada, US, Caribbean, Middle East, Australasia and Africa. Barrick has relied on Golder's expertise to analyze each operating environment to identify gaps and improvement opportunities based on known best practice and will use the findings to adjust their policies and processes and to inform future audits for the benefit of their people and their business.

Bryan Wilson, Associate and Senior OH&S Specialist, Courtney Gendron, Occupational Hygienist, Katia Rivera, Industrial Hygienist, Rob Stoyanoff, Senior Industrial Hygienist, and Evan Jones, Senior EHS Consultant, all from various Canadian offices, collaborated on this project.

Engineer of Record at El Soldardo

For the past five years Golder has fulfilled the role of Engineer of Record at Anglo American's El Soldado mine in Chile. Mining began on this site in the 1840s and currently around 12,500 tonnes of copper ore is produced each day. Golder as Engineer of Record is responsible for the safety of the five tailings dams on the mine site. Our work includes the design of monitoring systems, geotechnical investigations, stability analysis, seismic risk assessment and dam breach analysis. We are currently supporting Anglo American in the permitting of a further expansion of the tailings dam which will give another 10 years of mine life, protecting the livelihoods of 1000+ people, an important result for Anglo American who are committed to working with their local communities to achieve better health, education and employment outcomes.

The El Torito tailings dam at El Soldado Mine, Chile: water reclaim pond and barges, wet beach and sand wall in the distance.

Sustainable Development Outcomes Drive Approval for an Amazon Mining Project

Sustainability outcomes that reach beyond regulatory requirements and standard procedures is the intent of the proponents of a major greenfield potash project located in the environmentally sensitive junction of the Amazon and Madeira Rivers in Brazil. Potash is widely used as a fertiliser in Brazil where soils typically lack the nutrients that support healthy plant growth. The size of the potash deposit in Autazes is significant and is expected to reduce Brazil's need to import this product—critical to the agriculture economy in that country.

For the past six years, Golder has played a key role in helping Potassio do Brasil navigate the complex regulatory process that will enable this project to proceed. The location of the potash deposit is characterized by populations of traditional communities, sites of archaeological importance, and significant biodiversity that needs to be preserved and protected.

Over this time, Golder has supported our client through stringent approval pathways requiring multiple government agencies at state and federal levels, undertaken detailed environmental studies, and social impact assessments. Interactions with traditional people who have lived in in the area for centuries has been a feature of this work. The livelihoods of these communities are protected by law and they will benefit from the investment in the mine through employment, education, and support for the local economy.

Aerial mapping has enabled a detailed assessment of the of the site, part of which is seasonally flooded by the Amazon and Maderia Rivers. The Golder team has helped Potassio do Brasil select an optimal mine site on high ground to avoid flooding, and the positioning of the elevator shaft giving access to the potash deposit some 800 meters below the surface. The project master plan, which includes a 12 km road connecting the mine and processing plant with the Madeira river port for the transportation of potash, avoids areas of archaeological significance and minimizes the project's footprint on habitat of protected species.

The project received its preliminary license in 2017, a significant milestone. Gaining a construction license is the next step in the development of the mine for Potassio do Brasil.

Alexandre Pena is the Project Director, Leandro Jardim Arruda (M.Sc.) the Project Manager, and they are supported by Lucio Cadaval Bede (PhD), the Project's Senior Biodiversity Specialist, Daniel Corrêa (M.Sc.), Senior Geographer, and by a multidisciplinary team from the Belo Horizonte office in Brazil.

Renewables on the Rise

Across the globe renewable energy is at the center of the transition to a less carbon-intensive and more sustainable sources of energy. The renewables sector has grown rapidly over recent years, buoyed by cost reductions achieved on the back of the investment in solar photovoltaics and wind power, making these technologies more commercially attractive.

The Intergovernmental Panel on Climate Change (IPCC) established by the United Nations (whose remit is to provide the world with an objective, scientific view of climate change and its political and economic impacts) reported in 2018 that the effort to tackle climate change must be accelerated at scale in order to limit global temperature rises, an urgent reminder that global warming poses a grave risk to our planet.

In their 2018 report, the International Energy Agency forecasts that the share of renewables contributing to global energy demand over the next five years will reach 12.4% by 2023, a 20% increase on current levels. The fastest growth is anticipated in the electricity sector, with renewables expected to meet almost 30% of power demand in 2023, up 24% from 2017, and contributing more than 70% of global electricity generation growth. Solar photovoltaics, wind, hydropower, and bioenergy will all contribute to this outcome.

Golder is making a substantial contribution to this growing sector, providing a range of environmental, geotechnical and design services to hundreds of renewable projects worldwide.

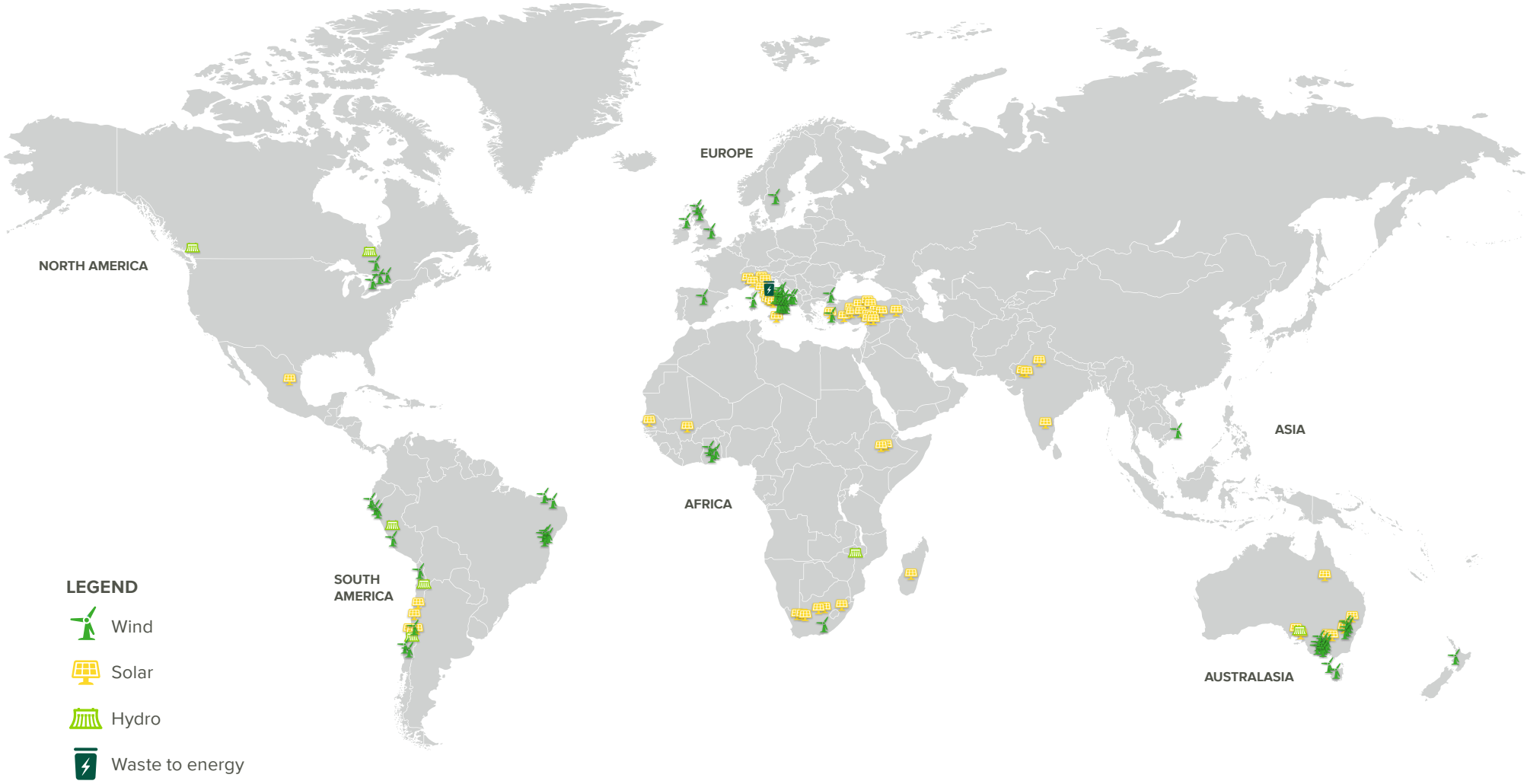
External Panel for the Canadian Centre for Climate Services benefits from Golder expertise

The Canadian Centre for Climate Services (CCCS) was established in late 2018 to help Canadians to adapt and increase their resilience to climate change and support the implementation of the Pan-Canadian Framework on Clean Growth and Climate Change. The CCCS is intended to be Canada's source of reliable climate information, data, and tools and provide training and support to help Canadians understand their current and future climate vulnerabilities, risks, and opportunities.

Sean Capstick, Principal and Senior Air Quality and Climate Change Specialist from the Toronto (Canada) office, has been appointed to the CCCS external advisory panel to provide expert advice for the development of the Canadian Climate Information Portal. The portal will leverage other online climate analytics systems from CCCS partners providing climate data and tools with analytic functionality to help strengthen national and regional capacity to guide decision-making that will help Canada adapt to climate change.

Renewables across the globe

Over the past five years Golder has provided expert advice to hundreds of renewable energy projects across the world supporting the development of over 20,000MW from renewable sources. These include wind, solar, hydro and waste to energy projects replacing the use fossil fuels with sustainable alternatives.



Supporting Enel Green Power to Strengthen Sustainable Energy Generation

Enel Green Power, a long-term client Italian multinational renewable energy producer, has looked to Golder to help them make their energy business operate in a more sustainable manner. As a producer of energy from renewable sources, EGP's commitment to sustainability is absolute, and looking inwards to improve their own sustainability performance reflects their central ethos. An employee contest held in 2018 revealed hundreds of opportunities to operate their sites more sustainably and with over 1200 wind, hydro, geothermal, solar, and biomass operating sites in 29 countries, the potential impact was substantial.

The catalog of improvement opportunities garnered from the ideas of employees was the starting point for Golder's involvement in this project. Our task was to expand on this work and look outwards to identify practices that could be adopted and adapted by EGP. This was an extensive desktop and field work exercise for Golder, a world-wide scan of competitors practices and published research. Golder was also able to tap into its own internal network, reaching out globally to colleagues for ideas and examples. In the first screening, over 120 potential improvement opportunities were identified by Golder. Enel have selected 18 of these and in a second phase of work, Golder took a deep dive investigation into each of these.

Golder consultants Emanuele Bobbio, Marcello Ciancaglioni, Roberto Mezzalama all from the Turin (Italy) office, and Adriana Fagone from the Padova (Italy) office worked on this project together.

Improving On-site Circular Economies

With three billion new consumers expected to enter the global market by 2030[1] and the resultant demand for goods and services, there is little doubt that the linear model of our industrial economy (take, make, waste) is not sustainable. The notion of the circular economy where resources, waste, and emissions are minimized by closing or narrowing energy and material usage loops, is gaining momentum. The World Economic Forum predicts that the transition towards a circular economy is estimated to represent a $4.5 trillion global growth opportunity by 2030 and has invested in this activity through the establishment of PACE, the Platform for Accelerating the Circular Economy.

During 2018 Golder worked on a project for global energy company Eni to improve the circular economy at two separate operations, a green refinery in Venice (formerly producing hydrocarbon-based products that was upgraded in 2014 to produce biofuels from vegetable-based oils and fat) and a fuel deposit close to Torino.

Golder analyzed the current performance of each operation focusing on water, resource, and energy use, waste production and impacts on biodiversity, identifying further actions that Eni can implement to improve the green refinery performance in terms of circularity. Feasibility studies have been undertaken for six of the recommendations made by Golder and are currently being considered by the client for their adoption on the sites.

[1] World Economic Forum Report, Towards the circular economy: Accelerating the scale-up across global supply chains

Golder consultants Nicola Antonicelli, Emanuele Bobbio, Lorenzo Fassino and Roberto Mezzalama all from the Turin (Italy) office, Stefania Magnani and Carlo Zaffaroni from the Milan (Italy) office, and Paola Bottega, Silvia Cestaro and Federico Rizzo from the Padova (Italy) office worked on this project together.

Renewables in Australia

A 2018 report by the Clean Energy Council of Australia details record investment in the renewable energy sector of US$9billon in 2017. 450MW watts of large scale solar, and 547MW of wind capacity was added in 2017, bringing total generation capacity to 4816MW, contributing to approximately 17% of Australia's electricity generation. Over the past five years Golder has contributed expertise to multiple renewable projects in Australia which together have the capacity to generate over 3000 MW of power or enough to power 1.8 million average Australian households*, and save 15 million tonnes of greenhouse gas emissions.**

Through our comprehensive and contemporary understanding of the renewables market, we've provided developers and contractors with a range of permitting, ground engineering and environmental services, helping to bring many projects to life. We have helped clients select sites, seek development approvals, and have undertaken Environmental and Social Impact Assessments in support of their projects. Golder is also involved with the design of many projects where our geotechnical input has realized significant material savings for developers, reducing project costs and CO_2 impact.

* *Based on a typical Australian customer type consuming 5000kWh of electricity annually, AEMC 2018 Residential Electricity Price Trends Review.*

** *Calculated using the NSW Wind Farm Greenhouse Gas Savings Tool.*

Australia is known as a "land of drought and flooding rains". This climate variability presents design challenges for large scale solar farms when combined with expansive soils that are prevalent over much of the continent. By tapping into our leading experts, Golder has developed design methodologies that reduce the depth of foundations needed to support solar arrays by around 20%. The reduction in steel and mechanical effort needed to install the foundations not only equates to a significant dollar saving but also a major reduction in the carbon footprint of the project.

In Tasmania, Golder's geotechnical expertise has resulted in an optimal foundation design for over 30 wind turbine foundations. This has translated into project cost savings in the order of AU$500,000 through reducing the amount of concrete required by 1200 tonnes and steel by 50 tonnes, with a resultant positive CO_2 impact of over 520 tonnes.

Investing in Innovation

Golder invested in a program aimed at supporting innovation in all its forms in 2018. This is an important initiative for Golder; not only is the ability to innovate a crucial aspect of technical excellence, it is also key to our ability to deliver a more sustainable future in partnership with our clients.

Pit lake water sampling using drone technology

The framework for Golder's innovation program encourages partnerships with industry, academia, and clients to develop real-world solutions. Golder's Technical Communities (communities of consultants linked by their specialist skills) serve as incubators to test and cross-fertilize ideas and generate new concepts as improvements to the services we provide to clients.

Four projects were funded through the Innovation Program in 2018:

- A collaborative research and development project for **remediating per- and polyfluoroalkyl substances (PFAS) contamination** in soil and water. PFAS have become of increasing concern around the globe due to their widespread use in a wide range of industrial processes and products creating a legacy of contamination and a potential risk to human health and the environment, and an unexpected liability for numerous businesses and governments.
- A new approach to the **assessment of the potential for tailings dam breaches**, an operational and enterprise risk faced by the mining sector which can have sudden and sometimes catastrophic human, environmental and economic impacts.
- A **pit lake water sampling method** using aerial drones solving several HSSE challenges relating to dangerous access to pits, working on water, and potential exposure to hazardous substances while in the pit.
- Using **machine learning models** to optimize mine material management, helping mining clients manage their materials more efficiently through the entire mine life cycle.

GTEC – Golder's first technical excellence conference

Golder is known for technical excellence – a foundational element of our organizational identity. In 2018, Golder held its inaugural technical excellence conference (GTEC) to further cultivate and advance this position at a global scale.

Golder has 26 specific Technical Communities that support the work of our consultants through networking, sharing ideas and best practices, and collaborative problem solving. GTEC takes this a step further by bringing together a cross-section of people from our technical communities in a single forum, focused on showcasing innovative practices and examples of technical and client-focused excellence.

Over 320 submissions were made to the organizing panel, a strong indication of the internal support for this initiative and the value it brings to Golder. After a rigorous review process, 80 submissions were accepted and eventually presented at the inaugural GTEC conference which was attended by over 200 people from across our organization.

GTEC will become a regular feature on the Golder calendar, promoting knowledge sharing and collaboration, and continually strengthening our Technical Communities of practice and supporting the long-term sustainability of our organization.

"My takeaway was just how inter-connected we really can be. Not just on the work that we do but the knowledge we have to work on bigger, better more innovative projects. When you start talking to people who are in different disciplines, and geographic locations a spiderweb of knowledge forms and you realize what a great suite of services we offer our clients."

Daley Clohan, Vancouver, Canada

"The variety, strength and breadth of Golder's offer was readily evident from the insights into colleague's work in delivering technical excellence and the promotion and monetization of innovation."

Henlo du Preez, British Columbia, Canada

AWARDS AND ACCOLADES

Portageville Bridge Replacement - ERA Award of Merit 2018

Golder served as the geotechnical Engineer-of-Record for the Portageville Bridge Replacement Project, located in western New York State, which received an “Award of Merit” from the New York division of Engineering News Record (ENR), an integrated media platform providing construction industry analysis, data, opinions, and news.

The new bridge (renamed the Genesee Arch Bridge) is the first steel arch bridge built since the 1940s for the US railroad industry and is a central connector on the railway’s Southern Tier Line, between Binghamton and Buffalo. Following a comprehensive study, it was determined that a new bridge was needed to improve train movements along the rail line, which were restricted to speeds less than 10-miles-per-hour, due to bridge’s age (built in 1875) and deteriorating condition.

The new steel arch bridge spans the Genesee River Gorge, which runs through Letchworth State Park, often referred to as the “Grand Canyon of the East”. Design of the new bridge required that its foundations be cut upwards of 120-feet into the river gorge sidewalls, significantly constraining and complicating bridge construction, as any activity could not adversely impact the river or park. As a result, the new bridge was constructed utilizing cantilevered construction methods.

Foundation design required extensive geologic/geotechnical assessments, and a detailed subsurface exploration program. Golder personnel rappelled down the river gorge sidewalls to develop a comprehensive understanding of ground conditions.

Impacts to wildlife within Letchworth State Park required careful consideration. The project team closely monitored a nearby American Eagle nest, a protected species. Tree clearing activities were limited to the period between late fall and early spring to protect and minimize impacts on the roosting habitat associated with a local population of bats. The old bridge was demolished and pier foundations in the river below were removed, restoring the river to its natural, unobstructed condition.

Construction of the new Genesee Arch Bridge is an engineering marvel, made possible by meticulous consideration to its foundation design. For Golder this was a decade-long project and is an example of how we can bring together a diverse, collaborative team (including staff from 13 offices across the US and Canada) to deliver technical ingenuity and practical solutions to complex challenges.

Bob Stetkar Principal from the Bristol (US) office was the Project Director. Mark McNeilly, Principal (Newark, US) was the Project Manager, and Jay Smerekanicz, Associate, from the Manchester, (US) office was the Lead Geologist / Engineering Geologist on the Portageville Bridge Replacement Project.

AWARDS AND ACCOLADES

Institution of Civil Engineers – George Stephenson Gold Medal

Dr Martin Cross, Technical Director, based in the Leeds (UK) office was awarded the George Stephenson Gold Medal by the Institution of Civil Engineers for his paper entitled, “Wallasea Island Wild Coast Project, UK: circular economy in the built environment”, published in the Proceedings of the Institution of Civil Engineers - Waste and Resource Management.

Dr Cross’ paper detailed the work he undertook as Project Director on the Wallsea Island Wild Coast Project. It is a ground-breaking conservation and engineering project creating Europe’s largest wetland nature reserve, transforming 670ha of farmland back to its original coastal marshland habitat of saltmarsh, mudflats and lagoons, and re-establishing lost populations of various wetland birdlife species. The island was reclaimed from the sea by Dutch engineers centuries ago but was finally ploughed flat 20 years ago to allow intensive wheat and rapeseed farming.

Construction excavation materials from the Crossrail project in London have been reused in the Wallsea Island project, a high-value conservation scheme, providing benefits for both people and wildlife. In total, 98% of excavated material from the project in London has been recycled and reused, with almost half being shipped to Wallasea Island – more than 3 million tonnes. A total of 2400 shiploads of material were delivered, removing the requirement for 150,000 haulage lorry movements from London’s roads. Further studies are being carried out to determine the overall CO_2 per tonne saving relating to lorry movements on the project.

The recycled excavation material has been used to raise land levels at Wallasea by approximately 1.5m and an innovative flood defense system incorporating new seawalls to protect vulnerable coastal areas from flooding has also been designed into the project.

Partnering with the nature conservation charity, the Royal Protection of Birds (RSPB,) was a key part of Crossrail’s sustainability policy. The RSPB hopes the new nature reserve will see the return to England of lost breeding populations of spoonbills and Kentish Plovers, as well as increasing already internationally important flocks of avocet, dunlin, red-shank and lapwing, along with Brent geese, wigeon and curlew in the winter months. The creation of these new habitats is designed to contribute towards UK biodiversity action plan targets and help mitigate the losses of these habitats elsewhere in Essex where they are under increasing threat because of climate change and rising sea levels.

This is a project that exemplifies the principles underpinning the circular economy, moving from a system of waste to one of ‘endless resourcefulness’, a model which presents a viable investment option to successfully tackle environmental priorities, drive performance, innovation and competitiveness while stimulating economic growth and development.

Dr Martin Cross, Technical Director from the Leeds (UK) office specializes in geotechnical engineering and engineering geology. He is passionate about what can be gained from the clever application of circular economy models and is currently working on a new project relating to the reuse of tunneling material from the Western rail access tunnel to Heathrow Airport, London, UK. The plan is to reuse this material to restore a gravel quarry at the site of the main shaft of the tunnel near Heathrow Airport.

Aerial view of Wallasea Island with reclamation works underway.

AWARDS AND ACCOLADES

Maria Ekblad (right) of Golder was appointed as project leader, supported by Louise Askear-Hune of STARK GROUP, and Morten Standlod (center) of Solum.

Golder wins Circular Construction Challenge

Golder, together with Stark and Solum, was one of three winners of the Circular Construction Challenge, an innovative competition set by Realdania, a philanthropic organization dedicated to improving quality of life for the people of Denmark focusing on the impact the built environment has on the fabric of everyday lives.

Golder's entry GENTRÆ – Circular Alternative: Reused timber in large-scale retail sale is specifically designed to address timber waste created by the building industry in Denmark. Each year approximately 55,116 tonnes of timber is used for temporary construction activity on building sites. Timber used for guardrails, toe board stairs, framework panels, and plywood hoardings are disposed of as combustible waste less than six months after being used on site.

This waste timber makes an ideal product from a circularity perspective. The volumes disposed of as waste are significant, it has a short life span and is not significantly changed during use or exposed to hazardous substances. GENTRÆ will collect timber from constructions sites, sort and repackage the wood at Solum, Denmark's largest waste recycling operator, and then resell the material via building supply company STARK. The GENTRÆ proposition is that by making recycled products available alongside conventional building materials, they become an attractive and natural choice for designers and craftsmen, thereby contributing to a paradigm shift towards increased circularity in the construction sector. So far five major contractors will provide access to waste collection at their construction sites.

The team received EURO130,000 (USD 150,000) to implement a prototype of this business model and over the course of the coming year the circular value chain will be analyzed to achieve optimal environmental, social and economic outcomes.

The idea for recycling timber originated with Golder, Stark and Solum. Maria Ekblad from the Golder Copenhagen office has been appointed supported by strategic partners; entrepreneurs Jensen A / S, C.G. Jensen A / S, Adserballe & Knudsen A / S, NCC, Enemærke and Petersen A / S, legal aid, Horten, and logistic support from WasteApp.

AWARDS AND ACCOLADES

Dr Hisham Mahmoud named EFCG CEO of the Year

Golder CEO, Dr Hisham Mahmoud, was named CEO of the Year (2018) by the Environmental, Financial, Consulting Group (EFCG), a leading global advisory focused on consulting, engineering and construction sectors. EFGC present this award each year to a CEO who has demonstrated outstanding leadership in the industry.

Dr Mahmoud has been a participant in EFCG's CEO Conference for nearly a decade and is a regular panelist on several key topics impacting the consulting industry. In 2018, Dr Mahmoud participated in the CEO panel for large companies alongside leaders from Stantec, HDR, CDM Smith, Ramboll, Jacobs, and SWECO, and moderated the Employee Ownership session.

EFCG's President Paul Zofnass was direct in his assessment of Dr Mahmoud's industry leadership. "We selected Dr. Mahmoud based upon his extraordinary leadership in the key executive positions he has held over the last two decades. Specifically, his leadership and impact on Golder's performance since he took over three years ago as Golder's first externally appointed CEO has been nothing short of tremendous, creating a lot of value in a short period of time," says Zofnass. "While it is easy to focus solely on the financial success of the business, we realize that such performance improvement is impossible without significant cultural alignment, which in our view only comes from strong leadership, starting with the CEO."

Top Supplier to the Mining Industry

Market research company PhiBrand has recognized Golder as a top supplier to the mining industry in Chile in a performance-based annual ranking exercise in the engineering category.

Deloitte Platinum Best Managed Company Award

Deloitte recognized Golder as a Best Managed Company for the 19th consecutive year. It is also the 12th consecutive year that Golder has been designated Platinum Elite status, assigned to companies that maintain their Best Managed status for seven years or more. Golder was selected from amongst the best-in-class companies with revenues over $15 million demonstrating strategy, capability and commitment to achieve sustainable growth.

CANADA BEST MANAGED COMPANIES Platinum member

AWARDS AND ACCOLADES

Canadian Brownfields Network (CBN) Brownie Awards

The Brownie Awards recognize the organizations and individuals who work to rehabilitate brownfield sites that were once contaminated, under-utilized and undeveloped to create productive residential and commercial projects, helping to grow healthy communities across Canada.

Golder received the 2018 RENEW: Development at the Community Scale Award for the Greystone Village Development Project in Ottawa, Ontario; was recognized as part of the winning team on the Bentway Project in Toronto, Ontario that won the REINVEST: Financing, Risk Management and Partnerships Award; and was short-listed in the REMEDIATE: Sustainable Remediation and Technical Innovation category for the Avenir Centre Sustainable Remediation Project in Moncton, New Brunswick.

Greystone Village Development Project in Ottawa, Ontario

The Greystone Village project was awarded LEED ND v4 SILVER certification in 2018, the first project in Ontario to achieve this designation and one of only three other projects within Canada. Located in the Old Ottawa East neighbourhood that is rich in history and nature, Greystone Village is a 26-acre master planned community being developed in three phases by the Regional Group - a Golder client for more than 20 years. It had been used for institutional purposes since 1876, and some buildings on the site have heritage designation. Once complete, the community will comprise 950 homes, retail, and recreational spaces. Golder supported this award-winning project with geotechnical engineering, environmental site assessment, site remediation, natural environment and archaeology services, from its embryonic stages through to detailed design and construction.

Working closely with the local community association and other public groups, the project realises practical and measurable environmental strategies and solutions including sustainable site development and landscape design, preservation of the historic Deschatelets buildings and Grand Allee entrance feature, priority for pedestrians and access to transit and the Ontario's multi-use pathway network. With Golder's guidance, the riverbank slope and adjacent parkland corridor area was excluded from the remediation effort, which would have disrupted the existing tree cover and adversely affected shoreline aquatic habitat. Bedrock removed from the City of Ottawa Light Rail Transit tunnel was reused and compacted as engineered fill to provide foundations for low rise building construction, thereby not using new aggregate resources and having to truck them large distances from quarries to the site; surplus soils from other projects in the city were also used for backfill.

Greystone Village

AWARDS AND ACCOLADES

Remedial Action Plan for Avenir Centre

Golder worked with the City of Moncton in New Brunswick Canada to develop a Remedial Action Plan detailing the necessary risk management measures for the construction of the Avenir Centre, a CAN91.5million recreation facility on an abandoned site in the heart of the downtown area.

The greenhouse gas impact of site development activities was significantly reduced by minimizing the amount of impacted soil removal from the site and the associated treatment at, and transportation to, a landfill recycling facility.

The facility itself will also have environmental benefits with a design that is more than 45% more energy efficient than the National Energy Code and meeting Green Globes Standards.

AWARDS AND ACCOLADES

Gary Zimmerman and Joseph Xi accepted the Best in State Gold Award on behalf of Golder.

Reda Mikhail and Ali Khoja accepted the Bronze Award. Attending the awards banquet was Josh Hanson, Jim Johnson, Alan Keizur, Ali Khoja, Jim Kleppe, Reda Mikhail, Margie Pryor, Cathy Smith, Joseph Xi and Gary Zimmerman.

Two Engineering Excellence Awards for Golder from the American Council of Engineering Companies (Washington, US)

The Best in State Gold Award for Unique or Innovative Applications was won by the Del Monte Fresh Produce (Hawaii) Inc phytoremediation project. You can read more about the project on pages 15-16.

The Arrivé Tower project in downtown Seattle received a Bronze Award for Unique or Innovative Applications. Golder used advanced 3D modelling technology normally associated with mapping subsurface structures for the mining industry to create an optimal shoring design for the tower. Using this method, and with in-depth knowledge of construction practices, Golder's 3D approach took advantage of the specific dimensions of the site to realistically shoring loading that resulted in a significant saving on construction materials, a welcome cost and CO_2 reduction for the project.

AWARDS AND ACCOLADES

CalGeo Volunteer of the Year Award – Lindsey Angell

Lindsey Angell, Senior Project Engineer from Golder's Sacramento (US) office was named CalGeo's inaugural Volunteer of the Year in recognition of outstanding service and leadership as the President of their Sacramento Emerging Professionals Group. CalGeo is California's only professional organization committed to unifying, strengthening and advancing the geotechnical consulting industry. Lindsey has been involved with CalGeo for four years, the past two serving as Vice President of the emerging professional's group. Under Lindsey's leadership, membership of the group has grown and Lindsey plays a key role in the professional development of young engineers.

Lindsey is clearly community minded: she also organizes teams for the annual Eppie's Great Race, a no-swim triathlon held in the Sacramento area. 2018 marks the fourth year that Golder competed in the event, raising funds for Therapeutic Recreation Services, a Sacramento County program serving people of all ages with special needs and developmental disabilities.

Above and Beyond Award for Nikki Delude Roy

Nikki Delude Roy, Group Leader and Senior Geologist, from the New Hampshire (US) office received the New Hampshire Business and Industry Association's "Above and Beyond" award for her contributions to the BIA's Manufacturing and End Users Policy Committee. The award is given annually to individuals who have demonstrated extraordinary service and commitment to BIA's mission to "promote a healthy business climate and robust economic future for New Hampshire."

AWARDS AND ACCOLADES

2018 Vancouver Geotechnical Society Award to Dr Upul Atukorala

Dr Upul Atukorala, Principal, Senior Geotechnical Engineer from the Vancouver (Canada) office is the recipient of the 2018 Vancouver Geotechnical Society Award which is given each year to a member who has made a significant contribution to the Society, and the practice of geotechnical or geo-environmental engineering.

Dr. Atukorala receiving his award from Roberto Olivera, Geotechnical Engineer

Future Leader Honor for Saurabh Saini

The American Industrial Hygiene Association (AIHA) selected Saurabh Saini from the Golder's Singapore office to participate in its prestigious 2018 Future Leaders Institute.

Saurabh is a Senior Industrial Hygiene Consultant and is a part of the industrial hygiene services team in Asia. He is a Certified Industrial Hygienist and is a member of the AIHA organization and the Singapore Occupational and Environmental Health Society.

Saurabh Saini presenting to clients

EBC Ascending Leader Award – Danielle Sylvia

Danielle Sylvia, Environmental Engineer (Manchester, New Hampshire) received the 2018 Environmental Business Council of New England (EBC) Ascending Leader Award. The award recognizes young professionals in the energy and environmental sectors demonstrating exceptional leadership and industry involvement early in their careers. Danielle was recognized for her team leadership at Golder and active presence on the EBC Ascending Professionals Committee.

Pictured: Paul Sutton (Senior Consultant), Danielle Sylvia (Environmental Engineer) & Alistair Macdonald (Senior Program Leader and Principal)

AWARDS AND ACCOLADES

Su Kwon Tan

ARC Linkage Grant to Build a Brick for the Future

Su Kwong Tan, Senior Geotechnical Engineer from the Perth (Australia), is one of three partners working on a project that has been awarded an ARC Linkage Grant by the Australian Research Council.

ARC Linkage Grants are designed to promote national and international collaborative research focused on Australia's national science priorities. Su Kwong and his project partners have designed an interlocking brick system that is resistant to seismic activity. The grant will fund the research and development work of a PhD student at Curtin University (Western Australia) to advance the product to commercial production. This project will have significant impact on construction technology for the benefit of earthquake prone countries such as Indonesia, PNG, New Zealand, and East Timor.

Australian Geomechanics Society – Don Douglas Youth Fellowship

Geotechnical Engineer Nikki Manche, from the Brisbane (Australia) office has been awarded the prestigious Australian Geomechanics Society- Don Douglas Youth Fellowship. This award is given to the author of the most outstanding paper from Australia at the Australian New Zealand (ANZ) Young Geotechnical Professionals Conference. The award went to Nikki for her paper "The use of early-works embankments in soft soil areas to optimize detailed design: Gateway Motorway Case study".

Nikki is the third consecutive Golder professional to receive the fellowship, and the sixth winner from Golder of the nine times the award has been given. All six recipients of the fellowship are still with Golder.

Nikki Manche, Geotechnical Engineer, receiving her award from Nigel Ruxton, Associate, the 2017 recipient of the same award.

AWARDS AND ACCOLADES

Tom Peters Memorial Mine Reclamation Industry Award

The Ontario Chapter of the Canadian Land Reclamation Association (CLRA) recognized Golder's work on the the bat-friendly progressive rehabilitation of the historic Edison Mine, via the Tom Peters Memorial Mine Reclamation Industry Award. These awards honor Tom Peters a founding member of the CLRA. See page 21 for more information about this project.

Project leads Paul Palmer & Josip Balaban receiving the Tom Peters award.

2018 Victor Milligan Award Winners

Named after Victor Milligan (1929 - 2009), one of the founders of Golder Associates, the Victor Milligan Award is an internal award given to the best technical paper published by a Golder employee in a given year and open to ground engineering practitioners in any Golder office worldwide. Victor was recognized worldwide for his expertise in geotechnical engineering and served as president of Golder from the early 1960s until the early 1980s, after which he continued as Chairman of the Board.

Daniel King and Joel Gniel are Golder's 2018 Victor Milligan Award Winners. Daniel, Senior Geotechnical Engineer, and Joel, Geotechnical Engineer both work out of Golder's Melbourne (Australia) office and co-authored their paper "Load-transfer platform behaviour in embankments supported on semi-rigid columns: implications of the ground reaction curve" with Abdelmalek Bouazza and Ha H. Bui at Monash University (Melbourne) and R. Kerry Rowe at Queen's University (Ontario, Canada). The paper was published in the Canadian Geotechnical Journal and was selected as one of the "Editor's Choice" papers by the publication.

Joel Gniel and Daniel King

CONNECTED TO OUR COMMUNITIES

Golder is deeply connected to communities worldwide through our work as engineers and scientists and through our giving which is focused on applying our skills and time to education, community enhancement, conservation and disaster recovery.

Orlinda Dineyazhe

Orlinda Dineyazhe recognized by Navajo Nation Environmental Protection Agency

Project Site Engineer Orlinda Dineyazhe, based out of Golder's St. Louis (US) office, was nominated for an Environmental Excellence Award by the Navajo Nation Environmental Protection Agency (NNEPA). Orlinda organized a huge clean-up effort in her home community of Blue Canyon—located on the Navajo (DINE') Reservation, approximately 160 kilometers north-east of Flagstaff, Arizona.

The Navajo Nation is the largest Native American territory in the United States covering 71,000 square-kilometers of land in north-eastern Arizona, south-eastern Utah, and north-western New Mexico.

Having lived in Blue Canyon for more than 30 years, Orlinda was concerned about the amount of waste being dumped along Blue Canyon Road—a beautiful and sacred five-kilometer stretch of red rock canyons, pinyon trees and sagebrush, and stepped in to act. Orlinda organized a community clean-up for the area on Labor Day in 2017, after a call out for volunteers in the local Navajo Times newspaper.

More than 60 volunteers showed up on the clean-up day, disposing of 60 cubic meters of trash, 300 tyres, and 18 liters of used motor oil from the area.

Dumping is a frustrating problem on the Reservation and there is no landfill or trash pick-up service. While residents can pay for this service, most people on the Reservation can't afford the fees, hence the illegal dump sites.

Orlinda hopes to influence a change in behavior by appealing to the resident's love of their country and respect for nature. She can see that much can be achieved when everyone works together. There are plans in place to make this an annual event and Orlinda is currently planning the next campaign in the Blue Canyon area.

OUR COMMUNITIES | LOCAL COMMUNITIES

Each year Golder employees around the world initiate activities to raise funds for local community organizations. Here is a small sample of this good work.

Festive Jumpers for Save the Children

Golder's Bourne End team wore their favorite festive jumpers for Save the Children's Christmas Jumper Day, raising funds for disadvantaged and vulnerable children across the world.

Adopt a Family Program Supported by Local Offices

Golder people from the London and Sudbury (Canada), offices have both supported Adopt a Family Programs. The Community Living London program matches organizations like Golder with families who need support. These families have at least one child in the home with an intellectual disability and require some help over the holiday period. In Sudbury, Golder supports the YWCA's program.

OUR COMMUNITIES | LOCAL COMMUNITIES

Jacksonville Golf Day Makes Dreams Come True

The Jacksonville (US) office hosted their annual Client Appreciation Golf Tournament in March 2018 raising $3,500 for Dreams Come True, a local non-profit organization supporting children with life-threatening illnesses. They are a community minded bunch in Jacksonville, also supporting the *Stuff-the-Bus* initiative collecting school supplies in Duval County so children in need can start the year with the supplies they need.

Octubro Rosa Shines a Light on Breast Cancer in Brazil during Breast Cancer Month

Colleagues from Golder's Brazil office turned out in solidarity with people in the community who are affected by breast cancer and to raise awareness about this disease by dressing in pink, a worldwide symbol of the fight against the disease.

Baseball Competition to Support the Sick Kids Foundation in Ontario

The Golder Boulders took on their rivals for a friendly game of baseball to raise funds for Ontario's Sick Kids Foundation. In 2018 this annual event raised $5000 to advance scientific research into childhood illnesses.

Team from Tampa Annual Giving

Each year Golder's team from Tampa, Florida, support two local not for profit organizations, the Metropolitan Ministries and Crisis Center of Tampa, donating food, clothes, toys, and items for personal hygiene at Christmas and Thanksgiving.

Golder Peru Annual Collection Supports Teenagers in Need

Every year the team in Lima (Peru) collects donations of warm clothing, toiletries, and non-perishable food to help people in need. The Don Bosco Foundation, which shelters children and teenagers in need during the frost season, was the recipient of these donations in 2018.

OUR COMMUNITIES | LOCAL COMMUNITIES

Eat My Lunch in New Zealand

People in the Auckland New Zealand office regularly buy their lunch from the Eat My Lunch organization. It is a buy one, give one free transaction. For every lunch purchased, a free lunch is given to a young person in need. In the three years since it was established over one million lunches have been distributed this way, the impact being felt in improved learning and social interactions in schools across the country.

Growing a 'mo for Men's Health

Golder teams in Australia grew beards and mustaches during Movember helping to raise funds to support men's health. Over $5K was raised in total, including Melbourne Principal Peter Brown's personal tally of AUD2,000.

Golder Employees Donate Sleeping Bags

Heather Jackson, Senior Project GIS Analyst from the Portland (US) office mobilized her office to support a sleeping bag drive organized by a local non-profit which assists low income senior citizens to find and secure safe, affordable housing. One in every five people living on the streets of Multnomah County is aged 55 or older, and while it is unacceptable that any citizen is living on the street - the 13 sleeping bags rated down to 0°F donated by the Golder Portland team provide some comfort during the cold Northwest winter while the local community grapple with the affordable housing crisis.

Obliteride – Riding for a Reason

Cliff Knitter, Principal and Practice Leader from the Redmond (US) office, and his wife Karen (pictured above) rode in the 80 km Obliteride, an event that supports cancer research at the Fred Hutchinson Cancer Research Center in Seattle. The Hutch, as it is fondly known, is widely acknowledged as one of the leading cancer research centers in the world. Supported by his colleagues, the 2018 event was Cliff's third Obliteride, helping to raise over US $2.5M for medical research.

The Redmond Office have Adopted a Road

Golder's Redmond office is part of the Adopt-A-Road program in King County, Washington and have volunteered on multiple clean up events each year for the past four years.

Golder adopted a 1.5 mile stretch of roadway in 2015 to become part of the King County Adopt-a-Road program. In the spring and fall each year since, a Golder crew has worked to remove litter from the county roads and improve the quality of the environment in the greater Redmond community. The most recent event was in the northern Spring.

The team begins each cleanup effort with a safety tailgate meeting and discuss the hazards of working alongside a road, program policies, what types of trash they would not pick up (dead animals, drug paraphernalia), how they would communicate and travel, and hydration. The team are passionate volunteers who care about the community they live in and want to keep it green and healthy. They are rewarded by the "thumbs up" and "thank you's" from runners, bikers and drivers along the route and by seeing the stretch of roadway left in a more pristine condition.

Photo from left to right PJ Nolan, Aaron Rydecki, Joseph Miller, and Peter Fahringer

Rivers Alive in Georgia

Golder's Atlanta (US) office has supported the Rivers Alive stream clean-up initiative for the past 12 years. Georgia's annual volunteer waterway clean-up event targeting all waterways in that State including streams, rivers, lakes, beaches, and wetlands. The aim is to involve the community in the preservation of Georgia's water resources and in 2018 the clean-up event was at the John Homestead Park in the upper Chattahoochee River watershed. Approximately 20 Golder people and their families gathered to pull non-native invasive vegetation, remove trash, and maintain trails.

Golder Brazil Donates Equipment to Local University

Golder Brazil donated 29 Tigrinus camera traps, used for photographing animals in the wild, to a local university. The equipment was no longer in use by Golder but will be very handy for the students and researchers at the Biological Science Institute of Universidade Federal de Minas Gerais.

Community Recognition for Golder in Queensland, Australia

Golder was nominated for the Queensland Volunteering Awards in recognition of the Brisbane office's long-term involvement with the restoration of Cubberla Creek. It's a project that commenced in 2010 as part of Golder's 50th birthday celebration with Golder volunteers and their families working to restore and maintain native plant species along the creek, helping to re-establish and maintain the ecological health of the Cubberla-Witton catchment in the inner-western suburbs of Brisbane.

Tree planting along Cubberla Creek in suburban Brisbane, Queensland, Australia.

Golder Young Graduates Program: Nokuphila Fun Day

Volunteers from Golder's South African Young Graduates Group from the Midrand, Pretoria, and Florida offices took some time out of their regular work schedules to spend a morning with first and second grade students at the Nokuphila School in Tembisa.

The program included many fun activities including face-painting, a photo booth, soccer, and novelty races, but importantly, two short educational presentations covering personal hygiene and water conservation were part of the event. The children were enthusiastic participants in the discussion about water as a vital resource.

Face painting at Nokuphila fun day

Raising Awareness about Urban Watershed Management

In Newfoundland, Canada, Golder supports the Quidi Vidi Rennie's River Development Foundation, an organization established to provide leadership in urban watershed management and operate *The Fluvarium*, a public center for environmental education, delivering environmental education programs to over 12,000 school children annually.

Supporting Client Initiatives

Golder staff from the Florida (US) office supported client Duke Energy with their "Duke Energy In Action" month where employees spend time volunteering in their community. During the month of March each year Duke Energy aim to undertake 31 community activities, one for each day of the month. Golder lent their support to a habitat restoration project at a property within the Lake Wales Ridge Wildlife and Environmental Area, near Auburndale Florida. The state-owned property is managed by the Florida Fish and Wildlife Conservation Commission. Together with Duke Energy, Bok Tower Gardens, and Green Horizons Land Trust, Golder helped to restore biodiversity to the habitat by removing exotic species, improving the area for pollinators, and improve the scrub lupine habitat.

Volunteers

Tim Mullings, Associate, from the Whitby (Canada), office, volunteers at Durham College to teach the procedures of an environmental soil sampling lab using soil cores collected for this purpose by Golder's local construction division.

Rowland Atkins, Principal and Geomorphologist from the Victoria (Canada) office, volunteers each year to direct an undergraduate applied geoscience project at the University of Victoria British Colombia for 4th year students, the objective being to show students how to apply what they have learned to a real-world problem. 2018 marks the fifth year that Golder has volunteered as a sponsor. Since 2016, Rowland has also given an Applied Geoscience lecture at Camosun College to help students connect their studies to employment prospects.

Employees from **Golder's Victoria (Canada) office** are involved in four local educational institutions Camosun College, Northern Lights College, Yukon College, and University of British Columbia in the Okanagan, supporting indigenous students pursuing post-graduate studies.

In the wake of the 7.0 magnitude earthquake that struck Anchorage, Alaska in December 2018, **John Thornley**, an Associate and one of Golder's senior geotechnical engineers, volunteered as an Earthquake Engineering Research Institute Reconnaissance Co-Lead to coordinate with Institute members and other organizations and agencies on the assessment and recovery effort.

Lynse Stafford, Senior Project Environmental Scientist, from the Horseheads (US) office, participated in the Habitat for Humanity Womens' Build in Chemung County in May 2018. Golder contributed USD500 in recognition of her substantial efforts on this community project.

Gyula Danko, Leader of the Nuclear Group in Budapest (Hungary) volunteers at the Miskolc University, Faculty of Hydrogeology as a member of the evaluation committee - at the final examination of BSc and MSc students.

OUR COMMUNITIES | GOLDER TRUST FOR ORPHANS

Golder Trust for Orphans

Established in 2003 by Golder employees, the Golder Trust for Orphans works to empower African communities to develop sustainable solutions that improve the lives of vulnerable children.

15 Years of Support

This year marked the 15th year the Golder Trust for Orphans (GTO) has led philanthropic programs that make a difference in the communities in which we live and work! As an employee-driven, corporate social responsibility initiative of Golder, the GTO measures success by how our donations can break the cycle of poverty and change mindsets in order to provide opportunities to improve the quality of life of vulnerable children.

We measure the impact of our work via two main metrics: survive and thrive. Survival impacts are immediate and are defined by how GTO donations contribute directly to helping vulnerable children and their families survive in the near-term. Thrive impacts represent a more long-term view and are defined by how GTO donations contribute to improving the quality of life for a generation, providing hope and a better future in a stronger community. Ultimately, our goal is to build more sustainable communities.

2003-2018 - 15 YEARS OF THE GOLDER TRUST FOR ORPHANS
Our distributed funds over the life of the GTO is US$15,000,000 USD

SURVIVAL IMPACTS

- **Food** – we contributed to providing meals for over 3740 vulnerable children per annum.
- **Water** – we contributed to providing access to clean water for 4300 people per annum.
- We are supporting **4 clinics** providing basic health care.

THRIVE IMPACTS

- We have established 7 solar projects that provide ongoing hot water and electricity to over 1000 children.
- Enterprise development – we supported the creation of 20 businesses that continue to provide over 300 jobs for local communities.
- Education – we created capacity for an additional 1100 children in schools who would otherwise not have access to education.

OUR COMMUNITIES | GOLDER TRUST FOR ORPHANS

Educational Materials for the Nokuphila school in South Africa

Education in Tembisa is under-resourced, particularly in pre-school education. Children at Nokuphila School are admitted based on their vulnerability and willingness of their caregivers to participate in school life. The Golder Trust contributed funds in 2018 to assist the school to purchase a range of education materials including textbooks, educational toys, stationary, ebooks and a range of equipment.

Malelane Greenhouse Project

Recognizing the benefits of growing green peppers in a more controlled environment, the GTO funded five greenhouses at the Malelane farm. The first crop of peppers was planted in April 2018 and harvested later in the year. Besides the improved yield, red and yellow peppers are now grown, and higher profits are achieved, due to the increased price potential for colored varieties.

Entrepreneurial Programs and Small Business School training

During 2018 around 90 people participated in an intensive training program at Philangethemba for small business owners covering record keeping, costing, pricing, and marketing. Golder volunteers helped to deliver some of the course modules which has been a success with many participants reporting significant increases in their business revenues.

Entrepreneurial Training in Tanzania

Golder volunteers facilitated a two-day business entrepreneurs' course at the Small Business School and helped to set up the shop front for one of the graduates of the course who has opened a mobile phone-based money transfer, financing and microfinancing service for the local community.

Bulembu Water Cooler Upgrade

The people of the small town of Bulembu in Swaziland, work to create a sustainable community by providing health services, orphan care, education, spiritual nurturing, employment and income generation. In 2018 Golder supported the expansion of an important social enterprise, a water cooler rental business that operates throughout the country by contributing to the purchase of 100 new cooler units and 500 18-litre refillable bottles.

Sustainable Power for the Philangethemba Impact Trust

Golder donations funded a solar project to provide a more reliable source of power. A 5kW PV(photovoltaics) system was installed and commissioned in February 2018 and is now operational. The system is designed to provide 60% of Philangethemba's overall power needs for the early childhood development program, workshops, and computer training labs.

OUR OPERATIONS

Our People

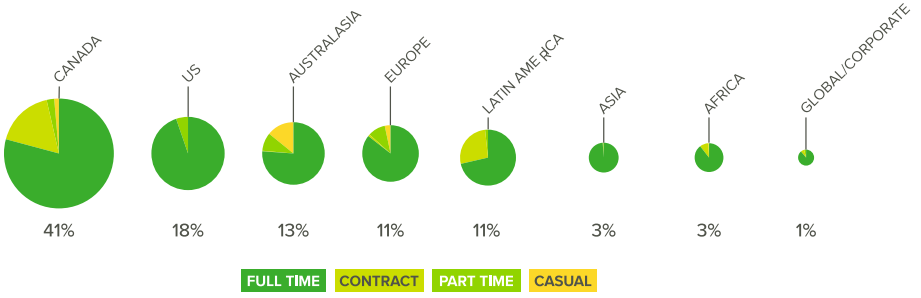
Golder's ongoing success, indeed the future sustainability of our enterprise, is linked to our ability to develop, retain, and attract talented individuals who are adept at delivering quality solutions and outcomes for our clients. Golder fosters a diverse and inclusive work environment where people are encouraged to learn and develop their skills, collaborate with colleagues to reach the best outcomes for our clients, and are rewarded for their contribution to our overall success.

The efforts of our human resources practitioners are geared towards this purpose, with specific objectives set out in our 2020 Strategy: defined roles and responsibilities with accountability for results, career development pathways, meaningful recognition and reward with a competitive, performance-driven compensation system, and a formal succession process for key leadership roles.

The HR function is organised around four centers of excellence focused on key HR functions, programs and systems, talent acquisition, global mobility, and compensation. The intent is to minimize and streamline administrative tasks and focus on strategic input, ensuring that Golder's present and future workforce meets its strategic growth objectives. The deployment of the Oracle platform globally advances this objective.

Total employees in 2018*

TOTAL NUMBER OF EMPLOYEES BY EMPLOYMENT CONTRACT & BY REGION



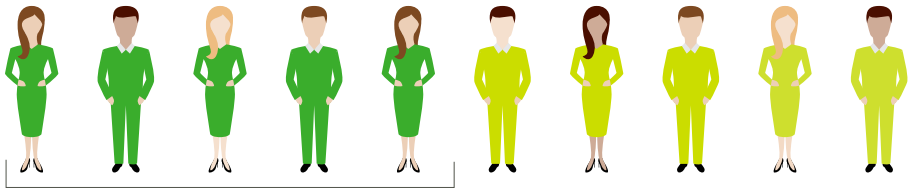
Programs and Systems Progress

Golder continues to make progress in creating a globalized and streamlined suite of programs and systems that underpin the human resources function. Employee Self-Service (ESS) and Manager Self-Service (MSS) were deployed in all our regions globally in 2018, both easily used and accessible tools replacing multiple systems across our business.

In 2017 the **High Performance and Contribution (HPC)** program was introduced in response to our employees' request to have ongoing performance and career input from their leaders and mentors. It involves multiple employee engagement points including career development and performance objective planning, a schedule of regular career development check-ins and a real-time feedback process with mentors. The second HPC cycle has been run in 2018 as an entirely paperless process, replacing the annual employee self-assessment as the single check-in point on performance, and fostering quarterly career development check-ins with mentors and a minimum of two formal scheduled conversations with leaders.

A formalized **succession planning** exercise commenced, an important plan for the long-term sustainability of our organization. Identification of critical roles and identified successors for each incumbent have taken place. Succession plans with specific development requirements for identified successors will be the focus of 2019.

SHAREHOLDER OWNERSHIP



55%

Of full-time employees own shares

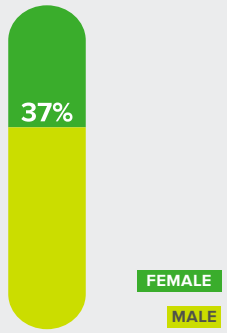
39,226

Courses completed in 2018

51%

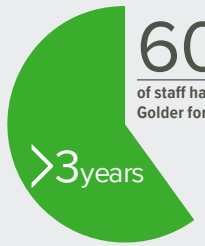
Increase from 2017

HEADCOUNT BY GENDER*



6,664

TENURE*



60%

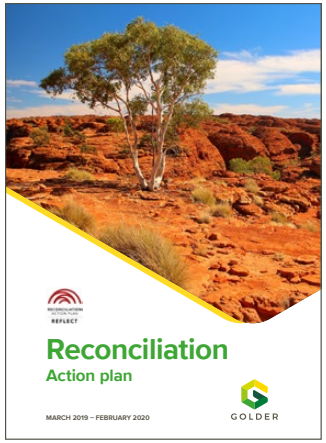
of staff have been with Golder for more than 3 years

60% have been with Golder for more than 3 years.

OUR OPERATIONS | OUR PEOPLE

An expanded **Talent Acquisition** team has been assembled with representation from each of our geographical regions, ensuring a consistent approach to recruitment across the organization. The team is focused on developing partnerships within their regional operations that meet strategic human resource needs, concentrating on local supply to attract talented people to our organization.

Reconciliation Action Plan in Australia



The Australian operation has established a Reconciliation Action Plan (RAP) following the process set out by Reconciliation Australia, an independent national expert body established to foster a just, equitable and reconciled Australia. Golder wants to develop a greater awareness and understanding of the cultures of Traditional Owners and also seeks to increase engagement with these groups. The process involves developing a RAP and having it ratified by Reconciliation Australia, an important step that formally recognises our commitment to this issue.

Golder's RAP plan sets out actions around three focus areas, each with ongoing future commitments that are integrated into normal operations to achieve a sustainable impact:

- **Relationships** – building stronger relationships with Traditional Owners in our local area.
- **Respect** – developing a deeper understanding of the cultures of traditional owner groups.
- **Opportunities** – actively seek opportunities to work closer with traditional owner groups.

While aspects of our plan are not widely visible because they involve changes to recruitment practices and other process, Golder will be an active participant in NAIDOC week in Australia and will sponsor high school and university students from Aboriginal and Torres Strait Islander communities to develop a greater interest in the Science, Technology, Engineering and Mathematics (STEM) pathways to boost indigenous participation. We will actively seek like-minded subcontractor and subconsultants and develop stronger relationships with these groups.

Golder's First Health and Wellness Exhibition

Golder's first Health & Wellness Exhibition for employees was held in the Mississauga (Canada) office giving our people the opportunity to meet and ask questions of representatives from the organizations that provide the various health, wellness, recognition and retirement savings programs and services available to them. Around 100 employees attended the event, and feedback from employees and company representatives alike was positive, with employees indicating that they received valuable information and insights about the programs and services they could access through Golder. Following on from the success of the initial event, a second exhibition was held in Calgary in November 2018 and a third in Vancouver in early 2019.

Gender Diversity at Golder

Golder ranks highly amongst 32 peer organizations on various measures of diversity in a survey conducted by an external specialist consultant. At Golder, we are enriched by the diversity of our workforce, not only because our geographic footprint represents the societies in which we work and live, but because we value diverse groups of people who bring different talents, skills, experiences, and viewpoints to teams, enhancing the learning we gain from each other and providing an environment where innovation can flourish.

WE'RE NUMBER 1!

50%

of senior managerial positions are occupied by women

WE'RE NUMBER 1!

22%

minority representation on the EHL Board of Directors

WE'RE NUMBER 3!

42%

of Golder's professional Millennials (people aged < 35 years) are women

WE'RE NUMBER 4!

35%

of professionals aged over 35 years are women

WE'RE NUMBER 4!

17%

of senior managerial positions are occupied by people identifying as a racial minority

WE'RE NUMBER 10!

27%

of EHL Board Directors are women

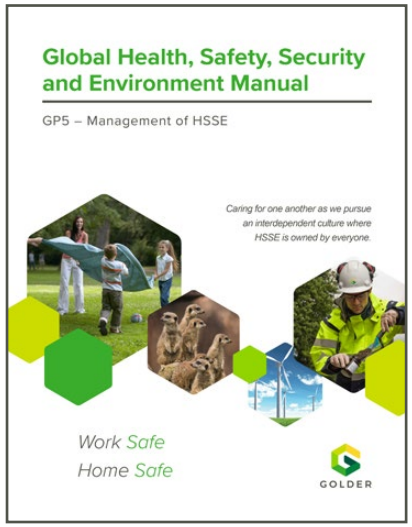
OUR OPERATIONS | HEALTH, SAFETY, SECURITY & ENVIRONMENT

Consolidating the benefits gained through the introduction of a globally consistent approach to health and safety practice has been the focus of work for our health, safety, security, and environment team in 2018. With a common approach our HSSE efforts can be more efficiently and effectively undertaken and that philosophy has propelled the changes that have now been adopted across the organization.

Embedding the Use of the Global HSSE Manual

In 2018, Golder introduced the Global HSSE Manual under the umbrella of the Golder Integrated Management System (IMS). While specific requirements about roles and responsibilities relating to HSSE had been in place, they were regionalized, and in some instances localized. In developing the global approach, Golder has brought together best practices gleaned from within the organization and from the close observation of clients and addressing the obvious risks and challenges of having differing requirements in various jurisdictions.

Over the past year, HSSE practitioners have worked closely with employees across the business to help them interpret and apply the global requirements to embed a consistent HSSE approach, a process that will take time to achieve the desired outcomes. Consistently applying global requirements has not resulted in a cookie cutter approach to HSSE, rather cultural and other idiosyncratic differences are supported within the framework without the need to depart from the overarching intent of global standards.



OVERVIEW OF HSSE STATS FOR 2018

2,501 Visible felt leadership events

7,077 International trips supporting our needs

19,888 Total number of reported learnings

2,191 Total number of senior leadership site visits

OUR OPERATIONS | HEALTH, SAFETY, SECURITY & ENVIRONMENT

Golder has over

75

Local Health and Safety Committees

HSSE tools reviewed

Golder's suite of HSSE tools used by employees to identify, assess, and mitigate risks on work sites, or as part of the project planning process, have been reviewed and adjusted to improve clarity of purpose and application. These tools are available globally and our people are trained in their use. Training on their use is ongoing to refresh employee's knowledge of these tools and the changes that have been made.

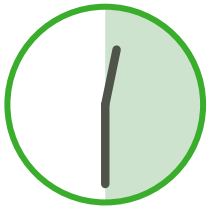
Mining our HSSE Learnings

In an average year an HSSE Learning is entered into the Learning's Database every six minutes; that's some 17,000 learnings each year and an indication of a strong HSSE cultural where people are keen to share their experiences and ideas to continuously improve HSSE performance and keep each other safe from harm. Learnings can take several forms, from near-misses, improvement ideas, and commendations for particularly good leadership or outcomes.

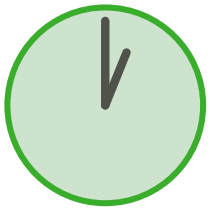
Digging deep into the data base to purposefully look for correlations and trends has been a body of work that commenced in 2018. With 20 specific data points for each Learning entered, on any given year there are over 300,000 pieces of data, multiply that by the number of years the Learning's Database has been operational and there are millions of data points available to us to mine, a substantial reservoir of useful information that we are developing useful ways to analyze.

With this project now underway, Golder is setting the foundation to undertake predicative analysis on an ongoing basis, so we can proactively implement control measures to reduce foreseeable risks from occurring.

Every 6 minutes
we enter a learning



Every 30 minutes
we capture a Visible Felt Leadership moment

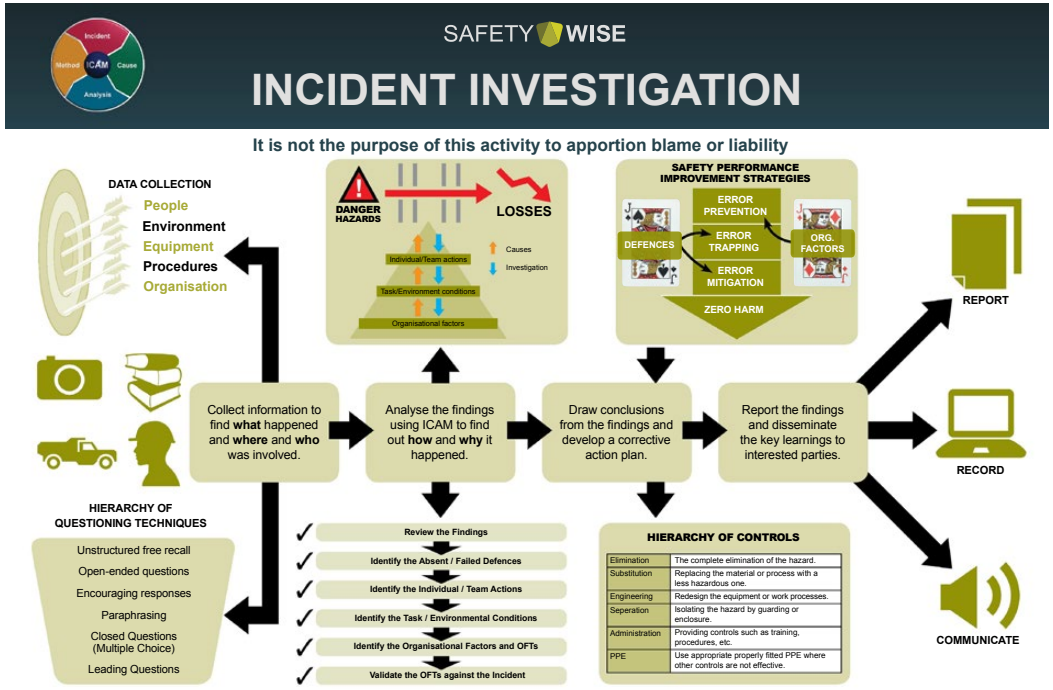


Every 60 minutes
a senior is visiting a site and sharing their experience

Global Application of ICAM Investigation Procedure

Golder takes particular notice of incidents that have the potential for serious injury or that could be fatal. Knowledge of these incidents arises via the regular monitoring of the Learnings database (although sometimes such incidents are visible before they are formally entered into the database) and once identified they are escalated to be investigated by senior practitioners in the organization.

During 2018 Golder began investigating these incidents using the Incident Cause Analysis Method (ICAM) process designed to unearth the underlying causal factors. There is a process in place to widely communicate about such incidents to share what has been learned and what could have prevented it from occurring.



"To have an accident is unfortunate. To have an accident and learn nothing from it is unforgivable."

R U OK? Day
Continuing the Conversation

Golder has marked R U OK? Day for the third consecutive year. The suicide-prevention and awareness campaign, which began in Australia in 2009, reminds us to check-in with our colleagues, and others we care about in our lives, to make sure they are ok—something we should be doing regularly. Every Golder office held activities to raise awareness and encourage engagement about mental health and the importance of continuing the conversation about this issue.

Caring is a core value at Golder and as a further demonstration of our commitment to supporting a strong and resilient work environment where people can thrive.

Colleagues in the Johannesburg office in South Africa celebrate R U OK? Day

2018 CEO Health Safety Security and Environment Awards

The CEO HSSE awards recognize those individuals and teams who advance Golder's health and safety culture. There are winners in three award categories and special commendations given to those who demonstrate exemplary achievements.

John Martinez from Albuquerque (US) received the **Proactive Measures Award** recognizing an outstanding contribution in the area of proactive measures taken to identify and mitigate risk, resulting in the preservation of the health, safety and security of our people and others.

John is the Site Safety Supervisor for water treatment at a former mining site in rural New Mexico. His leadership is notable in the supervision of 20 full-time staff working on 24/7 rotating shifts with multiple high-risk activities and zero recordable incidents.

Amy Suto, Environmental Scientist from Auckland (New Zealand) received the **Responsive Measures Award** recognizing exemplary actions taken in response to unforeseen events that endangered the health, safety and security of our people and others. Amy's quick response to seeing smoke near a terminal on an ExxonMobil site kept the on-site personnel safe and recognition from our client who also noted Amy's sustained dedication to promoting the full range of safe behaviors that create a culture of safety.

Krystle-Rae Biram, Associate and Senior Geotechnical Engineer, from the Brisbane (Australia) office received the **Care for Our Future Award** which recognizes an individual who demonstrates intentional investment in mentoring, coaching and instruction in health, safety and security, on a day-to-day basis.

Krystle-Rae has a well-deserved reputation for going above and beyond when it comes to safety, regularly training staff one-on-one, in addition to their Golder training, to create a safe and trusting environment and one in which they can receive detailed and personal answers to their questions regarding safety.

OUR OPERATIONS | CEO HSSE AWARDS

CEO Commendations

Commendations were given to the following people who demonstrated personal bravery and caring for their colleagues deserving of special recognition, or leadership and advocacy in creating a stronger HSSE culture within Golder by fostering an environment where awareness of potential hazards is driving a behavior-based rather than procedures-based approach.

The quick actions of **Chris Chesworth** and **Ken Allen** from the Calgary (Canada) office coming to the aid of a swimmer in cold lake waters was credited for saving a life.

The calm and quick response of **Vincent Reed** and **Jonathan Gutsche** from the Mt Laurel (US) office was credited by medical staff for saving their colleague's eyesight after chemical exposure.

The **Steveston Island team** (Vancuover, Canada) were well prepared to respond to an on-site emergency when a colleague suffered a heart attack. They continued to look out for one another and the greater community around then after their colleague sadly died, demonstrating Golder's core value of caring.

The **Imperial Oil team of Principals and Associates** have made P-Led (or Partner-Led) health and safety a top priority, setting a higher standard of behavior and creating a differentiated culture within the group who are team leaders for more than 130 people across Canada. As a team, they have built HSSE into the execution and management of their projects efficiently, and created a long-standing, extensive, national program of safety.

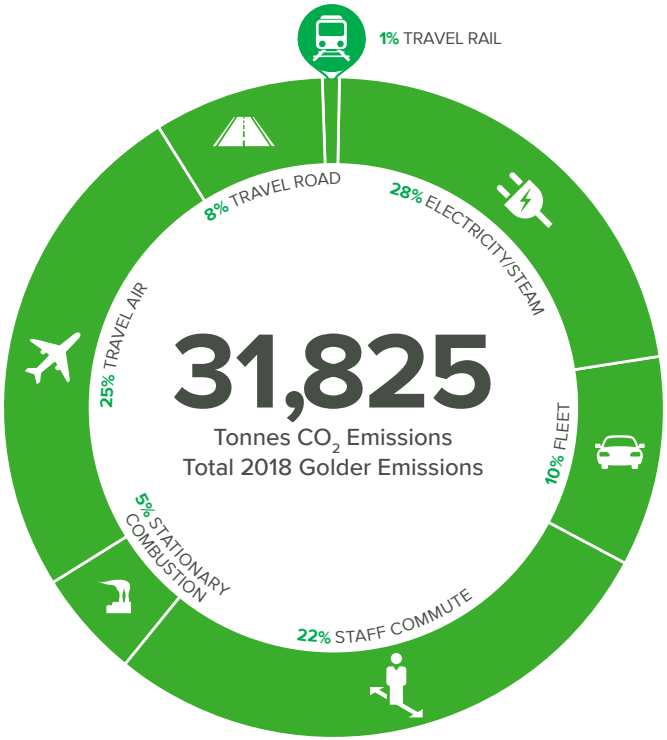
Tina Gauthier, André Bom (Sudbury) are credited for their proactive and innovative approach to address health and safety and for successfully advocating change in industry standard procedures to reduce risk and address the long-term health effects of chemicals used in laboratories.

The **Richmond (US)** office was the source of 15% of our submittals to the CEO HSSE Award in 2018, the highest concentration of participation in the award program. The office is also one of the most active in submitting learnings and proactively managing safety procedures. A leading example of the culture we aspire to have everywhere.

Carbon Footprint

Across Golder operations our internal commitment to the responsible use of energy and energy resources is steadily gaining momentum. This is evident in our year on year reduction of CO_2 output with our 2018 result 13% lower than our 2015 baseline 36,923. At this rate we are on track to meeting our 2020 objective of a 15% reduction by 2020.

Usage on some measures increased slightly and We recorded decreases in electricity consumption, business travel by air and road against an increase in employee numbers of 6.4%. We are pleased with this progress and understand we must continue to work with our employees and clients to continue and enhance this momentum.



Supply Chain

In 2018 Golder's Global Procurement continued its investigation to develop consistency in global procurement policies, procedures and systems that are needed to support improved supply chain performance. To aid this objective, Strategic Sourcing Specialists in each Golder region conducted an initial analysis of overhead spend. This analysis lead to strategic sourcing plans at a regional level. At the same time, the Procurement team has been conducting a global assessment of existing processes and systems that support our project supply chain. Particular emphasis is being given to identifying and managing supplier risk. The outcome of these two investigations will inform the design of a future global procurement program that will bring together the requirements of Golder's Procurement, Legal, HSSE, Quality and HR functions.

This is a **13% reduction** on the 2015 base year.

We are aiming for a **15% reduction** on the 2015 number by 2020.

GOVERNANCE

The Board of Directors of Enterra Holdings Ltd, the holding company of Golder's business, has ultimate responsibility for the governance of the organization. In 2018, the Board progressed a range of initiatives that advance sustainability at Golder, with both internal and external dimensions.

2018 EHL Board *– Back Row (L-R): Hisham Mahmoud, Neil Benson, Rens Verberg, Paul Cohen, Lisa Coyne, Jan Hermanson. Front Row (L-R): Richard Beddoes, Amy Langhorne , Marcelo Bastos, Denise Fletcher.*

Denise Fletcher

New External Board Appointment

Denise Fletcher was appointed as an external Director in August of 2018. With an extensive background in finance, mergers and acquisitions and corporate strategy in diverse public and private businesses, Denise's skills and experience will be well-utilized.

Preparing Future Directors

For over 50 years Golder has been a proudly employee-owned organization. The Board of Directors comprises 11 members, eight of whom (including the CEO) are Principals or Associates of Golder. The endurance of this business model has been further enhanced through the introduction of a Director Development Program. This program is designed to orient potential Directors for a future role by participating in a learning program with content delivered internally and externally, and augmented with Board mentorship, over a period of two to three years. Besides serving Golder's needs, this leadership development initiative contributes to the sustainability of industry professional bodies and not-for-profit organizations as participants will be encouraged to support the governance of such organizations as office holders and Board members.

GOVERNANCE | INITIATIVES

Anti-Bribery Anti-Corruption

Golder's global Anti-Bribery Anti-Corruption (ABC) Policy sets out the requirements for our business to comply with the anti-bribery and corruption laws in the countries in which we do business, or intend to do business, and prohibits corrupt payments or other improper conduct. All employees are required to participate in annual training concerning anti-bribery and anti-corruption and confirm their understanding of the provisions of the policy and the results of non-compliance. Non-compliance is monitored through Golder's Ethics and Compliance Hotline, Region Legal Counsel and self-awareness. Golder maintains a list of restricted countries where bribery and corruption are deemed a risk and undertakes the necessary assessments and third-party screening in line with our policy.

Evolving Partner Structure

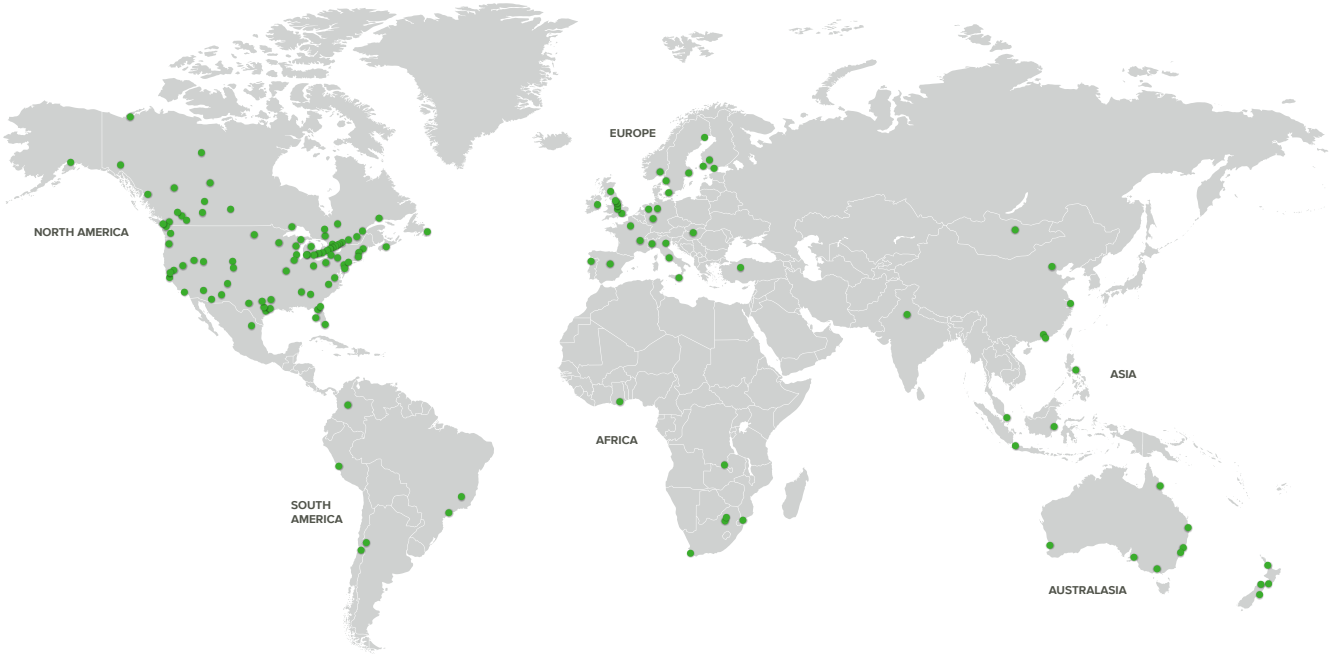
Each year Golder appoints new Principals and Associates (Partners) to the business through a robust nomination and selection process. These are critically important leadership roles and are central to the success of our ownership model and the long-term sustainability of our business. New Principals and Associates have demonstrated significant contributions to the delivery of our strategy, they are share owners, and have the potential to be Golder's future leaders.

Orienting our New Principals and Associates

In 2018 we adopted a new approach to welcome our new Principals and Associates. Led by our CEO and other key leaders, our newly appointed Principals and Associates gathered for an interactive immersion program designed to launch them in their new roles from a common platform of knowledge. In addition to the value gained through a deeper understanding of the global business, the personal connections made at the meeting are critical to sustaining the collaborative culture on which the company is founded.

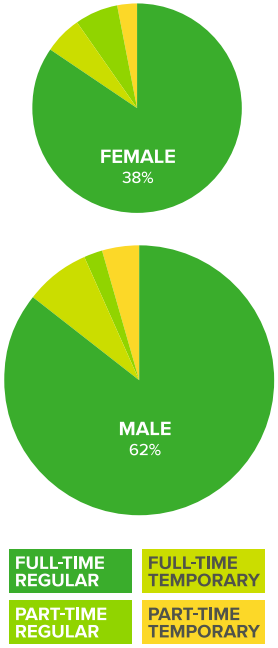
ABOUT US

Our Global Footprint



Who We Are

TOTAL NUMBER OF EMPLOYEES BY EMPLOYMENT CONTRACT & BY GENDER



By the Numbers

50+ Years — Founded in 1960 as H.Q. Golder & Associates by 3 industry-leading experts

6,600+ Employees

$1B+ Revenue — Annual Gross Revenue of $1B USD

165+ Offices

150+ Countries — We have conducted projects in over 150 countries

Industries We Serve

MINING · OIL & GAS · MANUFACTURING · TRANSPORTATION · GOVERNMENT · POWER

Services We Provide

ENVIRONMENTAL · GROUND ENGINEERING · REMEDIATION · REGULATORY COMPLIANCE · TUNNELLING · PIPELINES · DESIGN · CONSTRUCTION SUPPORT · WASTE · WATER

GRI REFERENCE TABLE

GRI REF	INDICATOR	LOCATION/COMMENT
GENERAL DISCLOSURE – ORGANIZATION PROFILE		
102-1	Name of the organization	Introduction – page 2
102-2	Activities, brands products and services	About Us – page 62
102-3	Location of headquarters	Golder does not have a designated headquarter location About Us – page 62
102-4	Location of operations	About Us – page 62
102-5	Ownership and legal form	About Us, Governance – pages 60-62
102-6	Markets served	About Us – page 62
102-7	Scale of the organization	About Us – page 62
102-8	Information on employees and other workers	About Us – page 62 Our People – pages 51-53
102-9	Supply chain	Carbon Footprint – page 59
102-10	Significant changes to the organization's size, structure, ownership, or supply chain	There are no significant changes to report. About Us – page 62
102-11	Precautionary principle or approach	Intoduction – Page 2, Governance – page 60
102-12	External initiatives	Golder is a signatory to the UNGC Global Compact
102-13	Membership of associations	Golder is a member of the Zofnass program at Harvard University, the Sustainable Development Council of New Zealand, Consult Australia, CIAC, and the ICMM.
STRATEGY		
102-14	Statement from senior decision-maker	Introduction – page 2 Governance – page 60
ETHICS & INTEGRITY		
102-16	Values, principles, standards, and norms of behavior	Governance – page 60 All employees are encouraged to complete training and understanding of the Code of Conduct.
GOVERNANCE		
102-18	Governance structure	Governance – page 60

GRI REF	INDICATOR	LOCATION/COMMENT
STAKEHOLDER ENGAGEMENT		
102-40	List of stakeholder groups	Materiality – pages 3-7
102-41	Collective bargaining agreements	Governance – page 60
102-42	Identifying stakeholders	Materiality – pages 3-7
102-43	Approach to stakeholder engagement	Materiality – pages 3-7
102-44	Key topics and concerns raised by stakeholders	Materiality – pages 3-7
REPORTING PRACTICE		
102-45	Entities included in the consolidated financial statements	As an employee-owned privately held company there are no publicly available consolidated financial statements or equivalent documents.
102-46	Defining report boundaries	The boundaries of the report are the Global operations and alignment of Clients priorities for sustainable development. Materiality – pages 3-7 About Us – page 62 Our Operations – pages 50-59 Our Work – pages 8-29
102-47	List of material topics	Materiality – pages 3-7 Material topics: 205 – Anti-corruption (Page 61) 302 – Energy (Page 59) 305 – Carbon Emissions (Page 59) 401 – Employment (Page 51) 403 – Occupational Health & Safety (Pages 54-58) 404 – Training and education (Page 54) 405 – Diversity & Equal Opportunity (Page 53) 413 – Corporate Social Responsibility (Pages 41-49)
102-48	Restatements of information	Not applicable in this reporting period
102-49	Changes in reporting periods	About Us – page 62
102-50	Reporting period	Calendar year
102-51	Date of most recent report	2017
102-52	Reporting cycle	Annual
102-53	Contact point for questions regarding the report	Wendy Stoveland
102-54	Claims of reporting in accordance with the GRI standards	This report has been prepared in accordance with the GRI Standards: Core option.
102-55	GRI Index Table	Evident herewith
102-56	External assurance	Not verified

Sustainable Development Goals

17 GOALS TO TRANSFORM OUR WORLD

GRI REF	INDICATOR	LOCATION/COMMENT
ANTI-CORRUPTION		
103	Management approach	Governance – page 61
205.1	Operations assessed for risks related to corruption	Governance – page 61
205.2	Communication and training about anti-corruption policies and procedures	About Us, Governance – page 61
ENERGY		
103	Management approach	Carbon Footprint – page 59
302.1	Energy consumption within the organization	Carbon Footprint – page 59
302.2	Energy consumption outside of the organization	Carbon Footprint – page 59
302.3	Energy intensity	Carbon Footprint – page 59
302.4	Reduction of energy consumption	Carbon Footprint – page 59
302.5	Reduction of energy requirements of products and services	Carbon Footprint – page 59
CARBON EMISSIONS		
103	Management approach	Carbon Footprint – page 59 Given the nature of our operations, Golder is not subject to any specific industry level emissions regulations and or policies.
305.1	Direct GHG emissions	Golder does not have any significant Direct Scope 1 emissions
305.2	Energy indirect	Our energy indirect (Scope 2) emissions are reflected in the energy consumption figures set out in: Carbon Footprint – page 59
305.3	Other indirect	Our other indirect (Scope 3) GHG emissions are given under Carbon Footprint – page 59
305.4	GHG emissions intensity	Our emissions intensity data is given on a per person basis. Carbon Footprint – page 59
305.5	Reduction of GHG emissions	CO2 emission reduction target set out on: Carbon Footprint – page 59
305.6	Emissions of ozone depleting substances	Not applicable to our business
305.7	Nitrogen oxides, sulfur oxides and other significant air emissions	Not applicable to our business

GRI REF	INDICATOR	LOCATION/COMMENT
EMPLOYMENT		
103	Management approach	Our People – pages 51-53 Code of Conduct – Golder code of conduct, built on and reflective of our values, guides the behaviors of all our employees, at all levels, wherever they conduct business. It sets out the expectations of Golder conduct towards her employees, employees conduct towards Golder, and conduct with clients and suppliers.
401-1	New employee hires	Our People – pages 51-53
401-2	Employee benefits	Our People – pages 51-53
401-3	Parental leave	Specific parental leave metrics not collected. Parental leave is accommodated according to different requirements in different jurisdictions.
OCCUPATIONAL HEALTH & SAFETY		
103	Management Approach	Health, Safety, Security & Environment – pages 54-58
403.1	Workers representation in formal joint management – worker health and safety committees	Health, Safety, Security & Environment – pages 54-58
403.2	Types of injury and rates of injury	Health, Safety, Security & Environment – pages 54-58
403.3	Workers with high incidence ir high risk of diseases related to their occupation	Health, Safety, Security & Environment – pages 54-58
403.4	Health and safety topics covered in formal agreements with trade unions	Health, Safety, Security & Environment – pages 54-58
TRAINING & EDUCATION		
103	Management approach	Health, Safety, Security & Environment – pages 54-58
404.1	Average hours of training per employee per year	Health, Safety, Security & Environment – pages 54-58
404.2	Programs for upgrading skills and transition assistance programs	Health, Safety, Security & Environment – pages 54-58
404.3	Regular performance and career development reviews	Health, Safety, Security & Environment – pages 54-58
DIVERSITY & EQUAL OPPORTUNITY		
103	Management approach	Our Operations, Diversity – page 53
405.1	Diversity of governance bodies and employees	Our Operations, Diversity – page 53
405.2	Ratio of basic salary and remuneration of women to men	Information not available
LOCAL COMMUNITIES		
103	Management approach	Our Communities – pages 41-49
413-1	Operations with local community engagement, impact assessments, and development programs	Our Communities – pages 41-49
413-2	Operations with significant actual and potential negative impacts on local communities	Golder has no operations with significant and potential negative impacts on local communities.