Banking on biodiversity

The thirst for liquid fuels

Banking on biodiversity
It’s important to look at the bigger picture

Which is why we’re proud to be an EPCM service provider for major mining projects across the globe

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Welcome to Issue 136 of GHD NEWS, a publication that captures our commitment to delivering value to clients and communities around the world.

In this edition, we focus on energy and resources, a sector that is experiencing a significant surge in investment to meet rising demand for commodities and cleaner energy supplies.

Showcased here are a selection of GHD’s projects including our work with one of the biggest copper producers in the world and our strength in Engineering, Procurement and Construction Management (EPCM) services.

There is also a wide range of insightful commentary on how to mitigate material fatality risks in mining operations, why a new approach to infrastructure investment in Australia is needed to realise economic benefits and how shale gas may be the solution to the industry's thirst for fuel.

Contributing to our local communities is extremely important to us. In addition to our ongoing support of the Christchurch rebuilding efforts, we are working with numerous indigenous communities in Australia, New Zealand and Papua New Guinea to support economic capacity building efforts. We have extended this commitment within the company by creating career pathways for 13 indigenous cadets, for which we have received six achievement awards from CareerTrackers.

I hope you enjoy reading this newsletter and look forward to your feedback.

Ian Shepherd
Chief Executive Officer

FRONT COVER: Courtesy of BHP Billiton
Access GHD NEWS online at www.ghd.com/ghd_news
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A recent merger with The Sernas Group (Sernas) broadens GHD’s presence in the Americas.

220 people have joined GHD across four new offices in Canada’s Greater Toronto Area (GTA) in Whitby, Mississauga and Kitchener and in the USA in Madison, Wisconsin. Sernas is a well-respected firm with a 50-year history of providing services in municipal and water resources engineering, transportation planning, land use planning, geomorphology, and environmental consulting.

“We are very excited to have Sernas join our global family,” says Ian Shepherd, GHD’s CEO. “We have been in search of the right partner in the GTA for some time. In Sernas, we have found a firm that aligns well with our business. Through our combined resources, GHD has the ability to expand our global reach to serve key infrastructure markets.”

Reg Webster, former President of Sernas says, “We are excited to be part of GHD, a global company with a strong Canadian presence. With our mutual commitment to clients and people, as well as our shared values and culture, GHD is the right fit.”

Richard Wankmuller, GHD’s General Manager for the Americas says, “Working together will enable us to better serve our clients and the communities in which we operate, extend our services, and provide new opportunities for our people. We see this as a business combination that amplifies the strengths of both companies.”

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GHD broadens its water services

The Water Sciences Group (WSG) of Australian Laboratory Services (ALS) has joined GHD.

WSG is a leading consultant in catchment management, ecological assessment, drinking water quality, water reuse and environmental management.

GHD has a history with the company, having partnered on a range of projects in the past. More than 30 WSG people have been integrated into GHD’s Brisbane, Canberra, Sydney and Melbourne offices.

Rob Knott, Operating Centre Manager for Canberra says, “This integration strengthens our water and environmental management services and helps address our clients’ regulatory and operational challenges.”

See story on page 19 that highlights some of our broadened skills as a result of this merger.
Breaking news

Support for the Global Foundation

GHD was a major sponsor of The Global Foundation’s 2012 Australia Summit: ‘Australia in the Asian Century – What does it mean for you, us, Asia and the world?’

As part of our involvement, Russell Board, GHD Chairman, introduced the Hon. Julia Gillard MP, Prime Minister of Australia, who delivered the keynote address.

The Global Foundation is a citizens’ organisation, based in Australia. Working closely with governments, it is funded and supported by more than 200 companies, universities, associations, eminent persons and individuals.

GHD has a long-standing involvement with the foundation and has participated in a range activities including past missions to China and high level roundtables.

Green technology delivers savings

Through our award-winning innovation program, GHD is harnessing the creativity, experience and knowledge of our people around the world to solve our clients’ challenges and capitalise on opportunities to contribute to the infrastructure industry.

To date, we have developed a number of unique ideas for application in the energy and resources sector. These include an efficient process to extract dissolved heavy metals from wastewater that is currently being trialled by a global mining company, and a safety device for materials conveyor systems.

One of our latest innovations is the GHD Pump Efficiency Meter System (GPEMS). Designed to be integrated with existing pump controls, the system monitors pump efficiency in real-time to optimise performance.

For mining, power and oil and gas operators with pumping assets, this innovation has the potential to improve pump reliability and save significant dollars in wasted energy.

Put simply, the GPEMS calculates pump efficiency data and compares it to the expected performance of a new pump operating under the same conditions. If performance falls outside of an acceptable range, the system places the pump into ‘lag’ mode and puts a more efficient one into ‘lead’ mode. At the same time an alarm is generated to warn operators.

GHD is currently implementing this innovation at a proof of concept site in the USA.

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(innovations)
In the news

01 Best employer
GHD has been named the fourth most attractive company to work for in Australia by recruitment firm Randstad. Stemming from Randstad’s survey of 7000 participants, the results illustrate that for people looking for a shift in their career; competitive salary and benefits, work-life balance and a pleasant working atmosphere are most important.

02 Best waste consultant
A recent survey by Inside Waste Magazine has identified GHD as the best waste consultant in Australia. Respondents from industry and government ranked 15 multi-disciplinary providers based on their expertise in a number of key areas. GHD was consistently cited as having the most experience across all the service categories and was ranked first for landfill and waste facility design and engineering.

03 Plant species found
GHD’s Ecology team in Geraldton, Western Australia (WA) recently identified a plant species considered to be extinct. Gyrostemon reticulatus, a one-metre tall shrub that has separate male and female flowers on different plants, was recorded in WA’s mid-west during the spring survey season of 2011. The specimen has been incorporated into the state’s Herbarium records.

04 Water roadmap
Two industry reports produced by GHD for the Australian National Water Commission were officially launched at the recent OzWater 2012 conference. ‘The Australian Environmental Water Management Report 2012’ and companion ‘Framework Criteria Report’ present a comprehensive roadmap of Australia’s current environmental water management arrangements and chart progress since the publication of the Commission’s 2010 baseline report.

05 Right on track
GHD, in alliance with John Holland, Abigroup, Coleman Rail and AECOM, has been awarded the Regional Rail Link project - City to Maribyrnong River works package in Australia. As the country’s largest public transport infrastructure project, the Regional Rail Link is designed to remove major bottlenecks on Victoria’s train network and give commuters access to a more reliable rail service.
Mardi-Mangrove Link

GHD, Gosford City Council and Wyong City Council in New South Wales, Australia have been recognised for their contribution to the engineering design of the Mardi-Mangrove Link project with an Engineering Excellence Award (Newcastle). The water project won the 2012 Infrastructure Excellence in Regional Communities Award and received a highly commended mention for overall excellence.

Phoenix rising

Our environment team in the USA has been successful in winning a new contract with the Arizona Department of Transportation (ADOT) to provide water/wastewater operations and maintenance services. GHD has been providing these services since 2005 under a similar arrangement.

Oregon wins

GHD has won two key projects in Oregon, USA. The State of Oregon Department of Corrections (ODOC) has selected us to provide on-call electrical engineering services. In addition, the City of Wilsonville has engaged us to provide design, permitting and construction services for the second phase of the Rivergreen Storm Water Outfall, which flows to the Willamette River.

Bridge opening

The Michael Herbert Bridge - the new bridge over the Patawalonga River in Adelaide, South Australia - was recently opened. GHD worked very closely with the City of Holdfast and was intricately involved in all aspects of the project. The bridge is the largest project the council has ever delivered.

Innovation grant

GHD’s innovation program is the proud recipient of a grant from Enterprise Connect, an Australian Government initiative that assists businesses with productivity improvements and professional connections. The grant enabled our innovation team and the University of Melbourne to host a clean technology forum, exploring pathways to deliver new technology to achieve cleaner outcomes in water systems.
1. The search for efficiency

In the current uncertain financial climate, many Energy and Resources (E&R) organisations are reconsidering expenditure levels and looking inward to create efficiencies. Examining operations, standardising processes and leveraging innovative technologies to replace inefficient systems are enablers to realising savings. GHD has been working closely with Anglo American in Australia to find ways to increase underground coal production as part of expansion plans at Moranbah South’s dual long wall underground coal mine. Similarly, on the oil and gas front, international studies into gas distribution and transmission issues are helping to identify efficiencies and drive productivity.

2. Thinking inside the box

Adopting standard designs, layouts and technical specifications for infrastructure on mine sites and then modularising its components is an emerging trend that is saving clients significant time and resources. To this end, GHD is helping a new mine development in Western Australia standardise its buildings such as staff accommodation and replicate them on other sites with minor modifications. The result? This method allows for earlier contractor involvement, which in turn improves planning and safety, while reducing project costs.

3. Return on investment: getting it right

The cost of doing business continues to rise while commodity prices are falling. As a result, organisations are re-prioritising project delivery funnels to maximise return on investment. In this climate, developing new projects is becoming challenging – particularly in hotspots like Australia – where there have been changes to taxation, while capital and skilled labour costs are increasing. GHD is working with BHP Billiton, Rio Tinto, Xstrata, Vale and other clients to provide price certainty for projects through comprehensive and responsive reporting methods and tools.

4. Large, long-life mines are the key

The attraction for organisations to invest in large-scale and long-life span projects is increasing. Operators are looking at ways to diversify their investments and are spreading their interests geographically in developing regions including Africa, Mongolia, Papua New Guinea, Philippines and South America. There is also a move by large international investors to own the entire supply chain - from mining, to steel production, power generation and transport infrastructure. GHD is assisting Chinese and Indian investors develop large-scale projects in Australia to achieve continuity of supply to keep up with demand for commodities.
The balancing act of water and energy

E&R organisations are responding to the challenges of water and energy management and are looking for ways to improve water efficiency and better understand energy sources across the supply chain. To this end, GHD is working on water management projects with BMA and Xstrata in Australia to improve water efficiency in their mines. On the energy side, we are assisting Codelco, a Chilean state-owned mining company, validate that their energy usage is optimised, safe and reliable.

Growing corporate social responsibilities

The universal catch-cry of the industry is the need to improve the quality and integrity of its systems relating to health, safety, environment and community (HSEC). Organisations with well-executed HSEC policies deliver economic and social benefits to communities that provide them with a licence to operate. GHD assists many clients across the globe to manage their HSEC risks, processes, management and reporting effectively. GHD is leading the industry in helping to manage risks with its proprietary SQRA® (Semi-Quantitative Risk Assessment) methodology, which analyses process safety and other major hazards to expose critical risks and engage people to mitigate them.
With significant capital expenditure taking place in the mining, minerals and power industries around the world, the trend towards Engineering, Procurement and Construction Management (EPCM) contracting is fast becoming the new norm. Brian Brown, GHD’s EPCM Service Line Leader says, “In today’s economy, project owners expect efficient delivery, timely schedules and cost control across the entire project lifecycle. An EPCM approach allows the project owner and the delivery team to strike a balance between cost and risk.”

EPCM incorporates every aspect of a project, led through a single point of contact. While this includes the expected services (engineering, design and documentation, procurement, contract and construction management) it also extends to encompass consultancy in health, safety, environment, community and sustainability, risk strategy and management, project execution strategies and plans for the full project lifecycle.

In 2011, GHD was contracted by one of the world’s largest mining, oil and gas companies to provide EPCM services for non-process infrastructure projects to support capacity expansion in the Pilbara region of Western Australia. Work under the five year EPCM Framework Agreement has commenced on study and execution projects including accommodation facilities, mobile equipment and rail workshops, administration buildings, transport infrastructure and utilities.

Brian adds, “Clients adopting an EPCM delivery model are increasingly turning to GHD. They benefit from a collaboration of in-house professional knowledge including constructability reviews, value engineering workshops and safety in design assessments. We help tighten their cash flow from project concept to completion with cost control and estimating models.

“By having a leading hand in the management of resources on site, non-process infrastructure and associated civil works, we can identify financial and technological trends in both the project and industry and work to develop proactive trend management. Being one full step ahead of the game means we can collectively analyse changes drawn from across the project spectrum and act accordingly.

“EPCM provides a fantastic opportunity for our people to showcase the collaborative, integrated platform that GHD demonstrates in wider industry.”
Despite considerable advancements in technology as well as health, safety and environmental practices, mining remains one of the world’s most hazardous industries.

“With the help of risk management, mining today is a much safer occupation than it once was,” says Henry Reynolds, GHD’s Leader for Risk Management.

As the industry matures, risk management practices are increasingly becoming the backbone of successful mining operations. They now extend to all aspects of mining and processing operations.

“Mining companies are developing and extending the way they manage risks,” adds Henry. “We’re now seeing an increased focus on minimising catastrophic events. However, this requires a different approach to how injury risk is managed.

“That’s why the world’s leading mining operators including Rio Tinto, BHP Billiton, Newcrest, Anglo American, Xstrata and MMG are leveraging GHD’s proprietary SQRA® (Semi-Quantitative Risk Assessment) methodology.”

Widely acknowledged as the leading technique designed specifically for catastrophic events, “SQRA is effective in managing material fatality risks,” says Henry, “because it focuses on these specific events rather than broader health and safety compliance issues. It has been tried and tested around the world and enables operators to put performance indicators in place for critical controls so results can be monitored and maintained.

“The benefit of SQRA is that it allows operators to assess and manage the risks of catastrophic events with the aim of reducing the likelihood that these events will occur.

“For example, we recently assessed the catastrophic risk of a client’s mine assets in various locations around the world. The outcome was extremely beneficial. It helped the organisation get a clear understanding of the risk, probability of occurrence and critical control measures for each of their sites. And, it established a clear benchmark for measuring future events.

“Overall, mining operators are finding that explicit attention to managing the risk of fatal hazards is resulting in robust decision making and more predictable outcomes in terms of projects, people and communities.”

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Over the past decade, the New Zealand Ministry for the Environment has been working toward remediating the Tui Mine site, located on the slopes of Mt Te Aroha in the Waikato Region.

A former lead, zinc and copper mine, the operation was abandoned in 1973 due to high concentrations of mercury impurities in the ore concentrate. Over the years, the mine has leached heavy metals into Tui and Tunakohoia Streams, negatively impacting water quality.

Funded by the Ministry for the Environment and local councils, the project is split into two phases.

Phase One, which is complete, involved reflooding the underground workings and injecting a lime slurry to neutralise groundwater acidity and immobilise heavy metals.

Phase Two, which is taking place now, aims to chemically and geotechnically stabilise the 130,000 m³ tailings impoundment and reduce leaching through in-situ and ex-situ amendment. This involves using a binder recipe comprising cement, industrial fine lime and crushed limestone. At full production, the stabilisation process uses in excess of 170 tonnes of binder per day. This has posed a number of logistical challenges due to the remoteness of the site.

GHD’s environmental team has been engaged on Phase Two of the project by specialist contractor, Hiway Environmental, to manage the demanding quality assurance and quality control of the remediation works. We are also providing environmental monitoring, laboratory management, sampling, data management and reporting services.

Wijnand Udema, GHD’s Project Manager said, “Once complete the remediation will deliver considerable benefits to the environment and the community. It will improve water quality, ecological values and aesthetics of the site, while addressing the impacts of the mine on the taonga (sacred treasure) of Mt Te Aroha.”

Phase Two of the project will approach completion in March 2013.
Codelco, a Chilean state-owned mining company, has engaged GHD to carry out a study of Operational and Maintenance (O&M) services on the high and medium voltage electrical assets of the Andina mine facilities.

Located 3000 m above sea level, the Andina mine draws its energy from the national power grid via more than 100 km of transmission lines and 10 main power substations.

“The challenges of the geographic terrain combined with weather patterns impact the mine’s internal power network,” explains Eduardo Valenzuela, GHD’s Project Manager. “As power is the lifeblood of any mine, improving its safety and reliability is essential.”

As part of this project, GHD is undertaking an audit of the organisational structure including Codelco employees and the external contractors in charge of construction and maintenance activities.

“We are also developing maintenance plans of the electrical grid and associated patterns of the power network with a view to reformulating existing plans,” explains Eduardo. “Plus, we are creating a critical equipment and spare parts list of the power network that comprises the transmission, transformation and distribution networks.”

Due for completion in August 2012, the study will enable Codelco to update its maintenance practices to boost operational efficiencies and mitigate safety risks.

“When it comes to O&M, we want to be as agile and responsive as we can be,” explains Carlos Sottolichio, Codelco’s Project Manager. “This project will give us the insight we need to streamline our O&M organisation to reduce downtime and improve service recovery. In turn, this will allow us to enhance the mine’s performance.”

“One of the biggest copper producers in the world evaluates its operational and maintenance strategy.

As power is the lifeblood of any mine, improving its safety and reliability is essential.”

Eduardo Valenzuela
GHD Project Manager

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Verve Energy engaged GHD to design and manage the construction of a new administration facility at its Muja Power Station in Western Australia.

Located south east of Perth and close to the town of Collie, Muja Power Station is capable of producing 854 megawatts – of electricity – or enough energy to power about 300,000 homes.

The coal-fired power station is home to managerial, administrative and engineering personnel that were previously housed in separate locations around the site. Realising that this separation was hampering productivity and reducing opportunities for collaboration, Verve Energy decided to provide its staff with a focused and visible presence on site.

An 1800 m² administration facility that closes the physical gap amongst Verve Energy’s employees was designed. Inspired by the industrial character of the site and surrounding buildings, it features improved office facilities and provides a striking corporate presence. The key design principles included natural light, passive solar initiatives and water efficient landscaping that contributed to the sustainability of the building.

GHD provided a range of services including feasibility study, schematic design, detail design, contract administration, tender evaluation and construction support. Our multidisciplinary team included architecture, interior design and engineering professionals who worked through inception, procurement and contract administration, utilising a 3D Revit hybrid model.

“The building is now occupied and has been well received,” says Verve Energy’s Ian Norminton, A/ Station Manager, Muja Power Station.

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Tapping into shale gas.

With crude oil prices on the rise and an emerging surplus of natural gas, mining operators around the world are looking at new ways to power their operations.

Converting hydrocarbons such as shale gas into diesel is one of the options being considered. While this technology has been around since the 1950s, it has never looked quite as financially appealing as it does now, with prices for natural gas so low and those for oil-based fuels so high. Last year, a Gas-To-Liquids (GTL) facility opened in Qatar that turns natural gas into enough diesel to power 160,000 cars per day.

Jonathan Beales, GHD’s Studies Manager for Oil & Gas discussed this concept at the 2012 Australian Petroleum Production & Exploration Association’s Conference & Exhibition.

“One of the interesting opportunities we have is with smaller scale GTL developments, particularly in Western Australia,” explains Jonathan. “Many shale gas deposits are located in remote locations, far from significant infrastructure, yet quite close to many mining operations. Since the majority of mining equipment is powered by diesel that is imported into the country and transported over long distances, the GTL solution is a good fit.”

While this process has been cost-prohibitive in the past, recent technological advances and economic realities are pushing the viability of synthetic diesel to the forefront.

Jonathan adds, “When you consider that a typical mine will use up to a million litres of diesel per day and that Western Australia holds the world’s fifth-largest reserves of shale gas at 288 trillion cubic feet, the numbers start to look favourable. Apart from the positive economic outcomes that GTL technology offers, there are significant environmental benefits including a reduction in emissions and maintenance costs.

“GHD is currently discussing the introduction of GTL in Australia with its clients. Our experience allows us to provide a bridge across the mining and oil and gas sectors. We also have the knowledge to investigate potential applications for this technology and implement a turnkey solution for clients wanting to realise its potential.

“Ultimately this is a great way to use our abundant natural gas resources to enhance Australia’s energy diversity and drive our nation’s competitiveness with cleaner fuel.”
GHD has determined the route alignment options for the Bunbury to Albany Natural Gas Pipeline corridor in Western Australia (WA) using innovative homegrown technology known as INDEGO.

The natural gas pipeline will provide a secure energy supply for the future economic and social growth of WA’s south-west and great southern regions.

GHD assessed existing and potential demands for gas and determined route alignment options for the corridor that best met these demands. These options also took into account social, economic, environmental and engineering considerations.

GHD’s Project Manager, Peter Murphy, said that INDEGO was a cost-effective way to narrow down route options and support the decision making process between options.

“Pipeline routing is always a compromise between the shortest distance between point A and point B, and the various constraints between the points that prevent the corridor from taking the shortest distance. Traditionally, this was a manual and time consuming process that was often unreliable and failed to properly consider the various options.

“With INDEGO, this process is automated and allows for comprehensive modelling of various routes and consideration of the ‘what-ifs’ in context. Using INDEGO is both efficient and cost-effective.

“Ultimately, it validates the selection of the least constrained and most cost-effective route for the corridor.”

The output from INDEGO was used by our client to explain the pros and cons of particular routes to stakeholders within government.

The corridor evaluation phase of the project is now complete and an announcement is expected to be made regarding the preferred corridor. GHD will then move onto the next stage of the project, which is to determine the optimum route within the corridor for the construction of a gas pipeline.
New **insights** into the oil & gas industry

In 2009, Barbara Jinks, Project Development Manager for GHD’s Oil & Gas business, was invited by the International Gas Union (IGU) to lead two study groups and coordinate responses in each from more than 40 members in 26 countries.

Now complete, the three-year research delved into two issues affecting gas companies around the world: Unaccounted for Gas (UFG) in distribution networks and securing sufficient talent to operate gas transmission systems safely and adequately.

**Missing link**

UFG is an element of the distribution industry that is not well understood, despite being experienced by the majority of Distribution System Operators (DSO). Theoretically, the amount of gas purchased should equal the amount of gas sold. However, due to metering errors, leaks, theft and other factors, UFG occurs.

The research found that gaining a better understanding of UFG is crucial to minimising impacts on a DSO’s financial, safety, environmental and social performance including brand reputation.

“It can only be managed well if it is approached as an integrated, whole-of-business, long-term issue,” explains Barbara. “This means addressing many, if not all, parts of the value chain.”

Results show that DSO favour leakage reduction, meter accuracy and cost efficiency as solutions as well as complying with emissions regulations and improving energy efficiency.

**Talent crunch**

The threat of securing sufficient resources to operate gas transmission systems safely and adequately without limiting future production was the subject of the second study.

“Alongside ageing assets, the workforce is getting older and the demand for skills is becoming critical,” says Barbara. “In terms of ensuring technical excellence, formal knowledge management systems are shown to be successful in transferring up to 50 percent of knowledge from older to younger workers.”

Yet, while most companies address technical skills, it is the softer competencies that can matter most, particularly in emergencies. The central finding of the study was that visible leadership, a good culture and motivation were critical to attracting and retaining talent. In addition, implementing a workforce management model contributes to increased levels of satisfaction, higher rates of employee development, lower rates of voluntary turnover and decreasing levels of employee stress. It also results in increased recruitment and retention rates, reduced incident frequency and increased profits.

“With the oil and gas industry set for explosive growth in the next decade, leveraging insight from studies such as these is really important,” concludes Barbara. “It’s all about making the most of the growth opportunities.”

As part of her ongoing involvement with the IGU, Barbara has recently been appointed Vice Chair of the Union’s Marketing & Communications Committee. She will also continue her involvement with research into different aspects of gas transmission.

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Australia’s freight landscape is changing with the next generation of rail networks.

According to Bloomberg, Australia is set for an AUD112 billion infrastructure boom to support China and India’s appetite for coal and iron ore. This includes laying as much as 3,700 km of heavy haul rail track in the next ten years to speed the movement of commodities from mine to port.

Martin Baggott, GHD’s Rail Leader says, “We are playing a key role advising governments, mine operators and key stakeholders on how to optimise the supply chain.

“For example, in the Surat Basin, a developing coal and coal seam gas area, we completed a feasibility study ten years ago to extend the Moura Line network to Gladstone. This project is now moving into the construction stage and will link up to ports in the area including Gladstone and the proposed Wiggins Island terminal for which we are undertaking marine and transport services.

“In the Bowen basin, we’re leveraging our experience with Xstrata (Tahmoor mine) to advise Anglo American on the possibility of running rail lines above underground mines. This is an area where we have pioneered innovative solutions.

“On the other side of the country, we’re working on intermodal initiatives in Lincoln Gap, near Port Augusta, to service the emerging coal, iron ore, silver and nickel mines. Intermodal terminals are increasingly sought as a way of realising reduced operating costs, greenhouse gas emissions, road accidents and congestion.

“In Western Australia’s Pilbara region, we’re modelling capacity options for Port Hedland’s expansion to support a considerable increase in iron ore tonnage.

“GHD’s transport business for mining and resources clients has evolved over the years from providing feasibility, design or construction management services. We now deliver a true turnkey solution from the mine face to the port including transport strategy, economics and logistics. This is becoming a real area of focus for us as operators look for ways to improve efficiencies and become more competitive on the world stage.”

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A new approach to infrastructure investment is needed to realise economic benefits.

A surge in the demand of energy resources in Australia’s Surat Basin is presenting opportunities for economic development but also putting pressure on local transport infrastructure. The region has an abundance of resource deposits estimated at 6 billion tonnes of thermal coal resources and 18,000+ peta joules of coal seam gas. With production expected to increase ten-fold by 2031, improving the basin’s road transport network is now an urgent priority.

“The increased frequency of heavy vehicle movement required to haul supplies, project cargoes, bulk fuel and giant equipment to mine sites is transforming once-free flowing networks into congested routes that are risky to use,” says Steve Kanowski, GHD’s Transport Strategy & Economics Leader.

“This is affecting the entire supply chain and is resulting in increased delays and road works which are impacting productivity and stretching limited tax payer funds.

“This is posing a real risk to the long-term viability of the basin. If infrastructure limitations restrict the ease with which mining operators can develop and operate sites, they may defer local investment and seek alternative locations to maximise rates of return.”

Planning, managing and operating infrastructure in harmony with growing activity can only work if industry, governments and communities act as a value chain to minimise the costs and maximise the benefits.

Traditional funding approaches may not deliver the outcomes required in a timely manner, so funding needs to better reflect contributions to costs and other impacts on particular user groups.

**The network thinking imperative**

“What’s needed is a network-based approach to delivering supplies to growing towns and geographically dispersed industries in the basin. This would allow all modes of transport along the entire affected routes to be reviewed and analysed. Control measures could then be implemented to guarantee a level of service so users can have access to the right infrastructure at the right time.

“This level of service can include guaranteed journey times, lane availability, roughness limits and adjusted weight limitations. In return, users ‘pay’ a premium for this guarantee and in some cases are able to carry extra loads on these routes.

“In short, this approach can lead to tailored maintenance schedules to accommodate peak travel and haulage operations – creating a win-win for asset owners and road users.”

For more information, contact Steve Kanowski on +61 7 3316 3151 or email steve.kanowski@ghd.com
With GHD’s assistance, improvements have been completed at the Otisco Lake Water Treatment Plant under the administration of the Onondaga County Water Authority (OCWA). Located in Marcellus, New York, USA, the plant treats up to 20 million gallons of water per day and serves more than 340,000 people through 90,000+ connections in Central New York.

The treatment plant was originally constructed in 1985, and has produced high quality drinking water over the past 25 years. However due to today’s more stringent regulations by the United States Environmental Protection Agency and the New York State Department of Health on the operation of water treatment plants and the quality of the water produced, OCWA undertook to upgrade the plant.

Other goals of the improvement project were to enhance safety and security; replace ageing equipment; enhance the quality of the water produced; provide for a more consistent flow of water from the facility and increase the energy efficiency of the water system operations.

GHD’s water team in the USA provided a range of design and construction services for the capital improvement program. Our people worked closely with OCWA staff on various performance upgrades to improve the reliability and performance of building systems and process equipment. We also developed an energy model that was incorporated in the design to reduce energy use and costs.

The project is now complete and operating successfully. OCWA is benefiting from significant performance improvements including water quality and operational enhancements to filter run times and backwash volumes as well as energy reductions. In turn, this is helping the organisation meet legislative regulations with greater ease.

Further validation of the project’s success was received recently when the American Council of Engineering Companies awarded OCWA the 2012 Platinum Award in the category of water.
Increasing pressure on groundwater resources, particularly in areas where mining activities are taking place, is fuelling a surge in studies to identify, map and assess Groundwater Dependent Ecosystems (GDEs).

GHD has one of the largest teams of subterranean fauna ecologists in Australia, which was recently expanded through our merger with the Water Sciences Group of Australian Laboratory Services. Experienced in stygofauna, hyporheic fauna and troglofauna ecology, our people are assisting mining companies and associated stakeholders to manage their groundwater resources in a sustainable manner and to ensure they meet legislative requirements more effectively.

Garry Bennison, one of GHD’s senior aquatic ecologists says, “Developing a better understanding of groundwater resources including groundwater ecology will underpin sustainable groundwater management in Australia, particularly in regions that increasingly rely on subsurface water resources.

“Our work with large mining companies across Australia including BHP Billiton, Rio Tinto, FMG, Xstrata Coal, Anglo Coal, BMA, Adani, Waratah Coal, Hancock Coal as well as state based natural resource management agencies indicates that research and management interest in groundwater ecology is growing rapidly.”

Our people have recently completed a joint aquatic ecology project with a leading mining group in the Australian Bowen Basin. It involved an integrated program of surface water aquatic ecology monitoring (i.e. fish, macroinvertebrates, vegetation, water quality and geomorphology) and groundwater ecology monitoring (i.e. stygofauna) with a research project on the hyporheic fauna of ephemeral streams located within the mining lease. It has provided valuable data to our client to support the development of a site-specific water management plan, in addition to providing a critical baseline from which the client is able to monitor the impacts of mining operations – including proposed expansions – on the health of local waterways and groundwater resources.

Stygofauna are subterranean aquatic animals, highly specialised for life in groundwater. Most are unpigmented, elongated and barely visible to the naked eye and include crustaceans, molluscs, worms, beetles and other less familiar invertebrates. Troglofauna are subterranean terrestrial animals that inhabit air-filled caves or smaller cavities below the ground and include spiders, millipedes and beetles.

Both stygofauna and troglofauna contribute significantly to regional, national and global biodiversity. Following recent work in the west, Australia is now considered one of the world’s ‘hotspots’ for subterranean biodiversity with more than 750 species discovered that are entirely new to science. Work currently underway in Queensland, South Australia and New South Wales is adding to this database of information.

The high degree of uniqueness that occurs in many stygofauna and troglofauna means that many species are at risk from development (mining, agriculture, urban development etc.) which can impact the quantity and quality of groundwater. Working both locally and globally, our team of ecologists leverage an aquatic ecology laboratory in Brisbane equipped to undertake the complex taxonomy required to identify groundwater fauna, including DNA analyses if required.

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Water in mining
Mitigating risks to groundwater dependent ecosystems.
Inner city residential expansion and the desire to improve current marine facilities, both environmentally and structurally, led the Port of Townsville to embark on the concept of a new marine precinct.

The precinct, which was opened in 2011, features a marina at the mouth of Townsville’s Ross River and will consolidates a large portion of the city’s marine industry into one central location. It provides modern facilities to support boat building and maintenance including berths for various vessels, refuelling facilities, commercial and recreational businesses and cold storage and distribution facilities for the seafood industry.

GHD was initially commissioned to provide an extensive Environmental Impact Statement (EIS) for the precinct plan which included a multi-use facility and required extensive investigation of both offshore and onshore elements.

“Key considerations in our planning were individual proponents’ requirements for effective workspaces, impacts on coastal processes, sediment transport down the river and within the bay, vessel navigability and the sensitive environments surrounding the port,” explains Brian Heggie, GHD’s Project Director.

“At part of this project, we delivered a range of services including historical data reviews, construction and infrastructure information, marine and terrestrial field investigation, hydrodynamic and sediment transport investigations, public consultation and project management services.”

In 2010, GHD began to bring the concept to life through detailed design and documentation works for Laing O’Rourke, who was commissioned as a sub-alliance partner with the Port of Townsville in the Townsville Marine Precinct Alliance. The project has evolved into a development featuring six wharfs, 450 linear metres of walling, the dredging of the harbour and reclamation and ground improvement of 11.25 hectares, development of pavement, civil works, drainage and site services and building concepts.

Brian continues, “The precinct has allowed Townsville businesses that were previously operating further upstream to move into purpose-built premises.”

A more environmentally and structurally robust marine precinct has been realised.

For more information, contact Brian Heggie on +61 7 4044 2203 or email brian.heggie@ghd.com

Photo courtesy of Cam Laird Photography on behalf of the Townsville Marine Precinct Alliance.
A 4.2 km stretch of Perth’s Great Eastern Highway is being upgraded from four lanes to six lanes between Kooyong Road and Tonkin Highway. Scheduled for completion by December 2013, key improvements include a widened central median, on-road cycle facilities, a continuous pedestrian path and bus priority lanes.

The investigation, design and construction is being delivered by the City East Alliance (CEA), comprised of GHD, Leighton Contractors, NRW and Main Roads Western Australia (Main Roads).

The project presented key risks in areas of utility impacts and road network operations. The team generated more than 100 qualifying innovations during the costing phase of the project spanning technological, process, methodology, materials and delivery improvements.

Adam Wilmot, GHD’s Services Design Manager for the project says, “The effort put into brainstorming, identifying, verifying and most importantly implementing ideas was validated by the client’s innovation panel, which awarded the CEA an Innovation Bonus. This achievement recognises a number of approaches that deliver immediate social, environmental and economic benefits for the project that can be transferred to other Main Roads initiatives.”

The most significant innovation is the development of a 3D model of all underground elements on the project, including existing and designed services, retaining walls, excavation extents, water table and foundations for all road furniture. The model has reduced the risk of impacting utilities, enabled collaborative solution development between utility authorities and the Alliance, dramatically reduced delays due to ‘unknown’ utility relocations, minimised customer disruptions, enhanced road design compatibility with utility asset locations and reduced the original project schedule by almost 18 months.

The project has recently won four excellence awards from Leighton Contractors - Western Australia in the areas of innovation, safety and health, community consultation and environmental / sustainable practices.

Innovation helps increase the efficiency, capacity and safety of one of Western Australia’s principal transport corridors.

For more information, please call Adam Wilmot on +61 419 927 949 or email adam.wilmot@ghd.com
George Weston Foods (GWF) has completed an upgrade of its bakery ingredients processing facility in Sydney’s Wetherill Park, to meet growing customer demand for bread and cake premixes.

GHD was involved throughout the lifecycle of the project. At the onset, our team consulted with GWF internal stakeholders to define the project. We then developed a 3D concept model of the entire site and the tender packages for the works and acted as Owner’s Engineer during the construction and commissioning phase. A range of specialist services including hazardous area compliance works were also provided.

The result is a state-of-the-art facility that has reduced the total number of production lines from seven to five and increased throughput while at the same time reducing labour and manual handling. Key production processes have been automated and the traceability of finished products and ingredients has been improved.

Eric Bugeja, GHD Job Manager says, “What’s innovative about this project is that 3D modelling was used both as a design tool and as a way to engage with stakeholders. This assisted us to workshop various options for the layout of the plant and ultimately optimise the design. The technology was also applied during construction to develop staging plans for the works so GWF could maintain production and minimise safety risks.”

Robin McConkey, Operations Director for GWF says, “GHD has displayed a sound technical base on this project and a strong commitment to a team approach to communication across all levels. It was also good to see GHD develop the youth in their organisation to ensure longer term benefits are achieved with maintaining an ongoing level of skills and competency. I was impressed by the calibre and culture of young people coming through the GHD organisation and working with us at site level.”
GHD has developed the Low Carbon Strategy for the UK’s National Health Service (NHS) in Wales.

This framework to reduce carbon emissions is being implemented through the participation of numerous regional and organisational functional units, and targets a diverse range of emission sources.

Completed in April 2012, the project saw our team in the UK develop a new approach to carbon management. As part of our engagement, we held a series of workshops with NHS and government stakeholders to shape and inform the new Low Carbon Strategy before it was submitted for approval to the Welsh Government.

Delivered in partnership with the Stockholm Environment Institute at the University of York, the strategy includes policy objectives as well as a carbon management process and reporting tool known as CarDio (Carbon Diagnostic). It covers three principal emissions categories:

- **Building Energy Use**: Electricity used by NHS equipment and fuel consumed for heating and hot water
- **Travel**: Emissions from NHS vehicles as well as patient, visitor, and business travel in vehicles belonging to third parties
- **Procurement**: Emissions created by suppliers and the extended supply chains associated with NHS procurement

CarDio is a simple spreadsheet tool that allows the local health boards and trusts in Wales to measure their carbon footprint and to monitor progress in carbon reduction year-on-year. It also enables the organisations to benchmark and compare against each other on a regular basis and share good practice.

Eric Thomas, Head of Environmental Management and Engineering for NHS Wales Shared Services Partnership – Facilities Services commended the GHD project team. He said, “The attitude and diligence of the GHD project team in scrutinising current practice and delivering innovative solutions was excellent.”
Liz Shelly, GHD’s Principal Environmental Scientist, said the biobank was a significant milestone for the country. “It brings wonderful social benefits to Aboriginal people in this area by providing money to manage their land, protecting cultural heritage and creating employment opportunities. This historic event was celebrated recently with key representatives from the Hunter 8 Alliance, the local Aboriginal community and the NSW Minister for Environment and Heritage (as pictured below).

As part of our work on the Hunter 8 Alliance, GHD has worked with the Wonnarua Nation Aboriginal Corporation to establish Australia’s first indigenous biobank site under the New South Wales Government’s BioBanking Scheme.

The Hunter 8 Alliance is a partnership between GHD, ARTC and John Holland tasked with designing and constructing the 40 km Maitland to Whittingham Third Track to improve rail reliability and capacity between Hunter Valley mines and the Port of Newcastle.

Biobanking is a market-based mechanism used for offsetting biodiversity impacts from development. In this case, biobanking credits from the 75 hectare site will be bought by ARTC to offset the project’s native vegetation impact. The site will be permanently conserved under the BioBanking Agreement and managed by the Wonnarua people, with young Indigenous Australians trained and employed in land management.

Australia’s first Indigenous biobank opens.

Top: Sharon Edgar-Jones, Wonnarua Elder, pictured on the biobank site.
Right: Pictured from left to right are Daniel William, GHD, Laurie Perry, CEO Wonnarua, Liz Shelly, GHD, Hon. Robyn Parker NSW Minister for Environment and Heritage and Wonnarua representatives Arthur Fletcher, Maxine Conarty, and Luke Hockey.

For more information, contact Liz Shelly on +61 2 4979 9942 or email liz.shelly@ghd.com
GHD has been actively engaging with Indigenous communities and associated stakeholders around Cairns, Cape York and the Torres Straits in North Queensland as well as Papua New Guinea.

“GHD has a long tradition of undertaking infrastructure works in indigenous communities,” explains Peter Sharry, GHD’s Indigenous Services Manager for North Queensland. “Today this work continues, and in addition, we have been focusing on how we can support economic capacity building efforts within the communities.

“For example, by working closely with people at Yarrabah Aboriginal Shire Council, we are helping to make a difference. We first became involved with the community when asked to fix a problem with the sewerage system. Since then, we have worked on a number of smaller projects to benefit health and safety.”

More recently, GHD has been working closely with the Queensland Department of Local Government and Planning (DLGP) tasked with managing government funded Indigenous infrastructure projects.

Peter adds, “Being involved in economic capacity building opportunities that help Indigenous communities foster change for the better is very rewarding. One such project is our work with Yuku-Baja-Muliku land-owners, where we are in early discussions regarding concepts for a sustainable residential development project, the vision for which has been developed by the local elders. Once complete the project will enable the community to live on their traditional land and better meet the needs of its people.”

GHD’s role in Indigenous development also extends outside of Australia, where our team in the USA and Canada is working with Indigenous communities.

“Overall, GHD’s aim is to facilitate improvement in the development outcomes for Indigenous communities around the world – not just today – but well into the future. We have a fantastic opportunity to be part of a positive change for these communities.”

For more information, contact Peter Sharry on +61 7 4044 2207 or email peter.sharry@ghd.com
Indigenous employment boost

GHD has been recognised by CareerTrackers – an Australian not-for-profit organisation that works with Indigenous university students and private organisations to create career pathways.

At the recent gala awards celebration dinner, GHD received a total of six awards including the Trailblazer Award and the overall Corporate Plus Award for our contribution and efforts in placing Indigenous cadets across Australia.

Jill Hannaford, GHD’s Manager – Community Consultation & Social Planning New South Wales was named Business Supervisor of the Year and Peter Dunn, our Indigenous Services Business Leader received an MVP Award for his active promotion of the CareerTrackers program within GHD and the broader business community.

In addition, two of our interns received student awards. Charlee-Sue Frail received an Academic Excellence Award for achieving a yearly grade average of distinction in her Political Science and Anthropology degree course with the Australian National University. Devyn Jackamarra received a Community Award for his outstanding commitment to the development of his own individual community.

CareerTrackers currently has 125 cadets in Australia, of which 13 are placed with GHD, making the company the single largest supporter of this program.

24-hour mega swim

The GHD Guppies, a team of 15 swimmers from our Canberra office in Australia, recently participated in the annual Multiple Sclerosis (MS) 24-hour Mega Swim.

Team captain, Samantha Patterson says, “This is the third year that a team from GHD has taken part in the event and our involvement continues to grow.”

This year the team raised more than AUD30,000 and took out first place as the highest fundraising team in the ACT.
**RANKINGS**

**RANDSTAD AWARD 2012**
Fourth most attractive company to work for in Australia (2012)

**INSIDE WASTE MAGAZINE**
2012 Best waste consultant in Australia

**RECOGNITION**

**ENGINEERS AUSTRALIA**

GHD CEO, Ian Shepherd, named one of the top 100 most influential engineers in Australia for 2012

**AWARDS**

**AUSTRALIA & NEW ZEALAND**

**ENGINEERS AUSTRALIA**

- 2012 Infrastructure Excellence Award (Newcastle) Regional Communities Category – Mardi-Mangrove Link Project
- 2012 Award for Excellence (Newcastle) Highly Commended – Mardi-Mangrove Link Project

**SMART WATER FUND**

2012 Service Provider Innovation Award – Water Atlas

**LEIGHTON CONTRACTORS WA**

2012 Excellence Awards – City East Alliance (of which GHD is a member):
- Innovation Excellence Award
- Safety & Health Excellence Award
- Community Excellence Award
- Environmental Excellence Award

**PLANNING INSTITUTE OF AUSTRALIA**

2011 Award for Excellence – Canning Bridge Precinct Vision

**INTERNATIONAL WATER ASSOCIATION (IWA)**

- 2011 Project Innovations Award – Honour Award Small Project Category – TetraTrap device to manage stormwater contaminants for Auckland Transport’s road network
- 2011 Development Award – Honour Award Hardware Water Category – MSABI Safe Water for Better Health Project (sponsored by GHD in the Community)

**MIDDLE EAST**

**MIDDLE EAST ECONOMIC DIGEST (MEED) AWARDS**

2012 Leisure & Tourism Project of the Year (UAE) – Matajer Al-Quoz Project (Shopping Mall)

**OVERSEAS BETCHEL**

2011 Award for Safety Performance – Long Term Environmental Monitoring Program New Doha International Airport (NDIA), Qatar

**USA**

**AMERICAN COUNCIL OF ENGINEERING COMPANIES (ACEC)**

2012 Excellence Awards:
- Platinum Award – Water Resources Category – Otisco Lake Water Treatment Plant Improvements Project
- Grand Award – Building/ Technology Systems – Portland State University Campus (Infrastructure for steam and chilled water utilities)

**AMERICAN SOCIETY OF CIVIL ENGINEERS**

2012 Outstanding Architectural Engineering Project of the Year State Award (Region 9) - City of Santa Rosa Utilities Field Office
01 Bryce Taplin recognised
One of our civil engineers, Bryce Taplin, has received a Future Leader Award from Consult Australia. This prestigious award is one of only three such awards given nationally to professionals in Australia, and is testament to Bryce’s commitment and leadership skills.

02 NYWEA Hall of Fame
Robert Butterworth, a civil engineer from our Cazenovia, USA office has been inducted into the New York Water Environment Association’s (NYWEA) Hall of Fame. He was chosen for his commitment to improving the quality of the waters of the State of New York during his career and providing many years of leadership to NYWEA.

03 ISI Board Chair
Howard Lafever, a Board Certified Environmental Engineer (BCEE) has been appointed to chair the board of directors of the newly-formed Institute of Sustainable Infrastructure (ISI) in the USA. Based in our Cazenovia office, Howard is well respected for his contribution to a range of infrastructure developments and commitment to sustainability.

04 Guiding development
Simone Fogarty, one of GHD’s Principal Planners has been appointed as a Member of South Australia’s Development Assessment Commission for a period of two years. Along with other members, Simone will be involved in providing advice to the Minister for Planning on proposed developments.

05 World’s greatest shave
GHD’s Newcastle office has once again provided support to the Leukaemia Foundation’s World’s Great Shave event. The team, led by Operating Centre Manager Tasos Katopodis, raised significant funds for the charity.

06 Don Ferlow honoured
One of our US-based senior landscape architects, Don Ferlow, has been named the 2011 recipient of the Distinguished Practitioner Award in Private Practice by the New York Upstate Chapter of the American Society of Landscape Architects. Don has been honoured for his service and dedication to the profession over four decades.
07 Riding in the Mont

Three teams of cyclists from GHD’s Newcastle and Canberra offices in Australia recently participated in the Mont, a 24-hour mountain bike challenge. This endurance event required our cyclists to complete as many laps of the 18 km track as possible during the day.

08 Manila gives back

GHD in the Philippines has donated 15 computers to the elementary school of Tibig, a barangay (village) located on the Taal Lake about 50 kms south of Manila. A team of GHD Young Professionals took time out to set up the computers and software at the school and received a great welcome from the children.

09 MSABI wins award

The GHD in the Community sponsored MSABI project in Tanzania has received the 2011 International Water Association (IWA) Development Honour Award in the hardware water category. GHD’s Dale Young, the creator of the initiative, recently attended the biennial IWA Development Congress to accept the award.

10 ACEC Award for GHD

Our work on the Otisco Lake Water Treatment Plant Improvements Project in the USA has earned us an Engineering Excellence Award from the American Council of Engineering Companies (ACEC) of New York. We received the 2012 Platinum Award in the category of Water Resources. (See story on page 18).

11 Traffic/highway excellence

Anthony Fichera, a traffic and transportation engineer from our Sunshine Coast office in Australia has been awarded the Royal Automobile Club of Queensland (RACQ) Prize for Traffic/Highway Engineering from the University of Southern Queensland. The prize was awarded to Tony for his thesis on ‘A Practical Comparison of VISSIM and SIDRA for the Assessment of Development Impacts’.

12 Railway appointment

Our Operating Centre Manager in the UK and Europe, John Dutton, has been appointed to the board of the Permanent Way Institution (PWI) as a non-executive director. PWI is one of the world’s leading associations for railway track engineers involved in the design, construction and maintenance of track and infrastructure.