

# BIRD IN HAND WASTEWATER TREATMENT PLANT UPGRADE

## A GOLD MEDAL UNION

**MAIN CONSTRUCTION COMPANY : GOLD Alliance -  
Leed Engineering and Construction Pty Ltd and  
Guidera O'Connor Pty Ltd**  
**DEVELOPER : SA Water Corporation**  
**PROJECT END VALUE : \$60 Million**  
**COMPLETION : End 2011**

The joint venture between Leed Engineering and Construction Pty Ltd and Guidera O'Connor Pty Ltd is certainly a gold-medal winning one.

GOLD Alliance was engaged by South Australia Water to deliver the upgrade for the Bird in Hand waste water treatment plan. The scope included the detailed design, construction, installation, testing and commissioning of the works including earthworks, civils, buildings, mechanical, electrical, instrumentation, control & automation components.

The wastewater process comprises of screening, grit removal, bioreactors, clarifiers, flocculation tank, disc filters & UV disinfection. alum & caustic chemical dosing.

The sludge stream comprises of waste activated sludge pumping station, gravity drainage deck sludge thickening, poly make up and dosing, anaerobic sludge digestion & sludge dewatering.

Bird In Hand is not the first time Guidera O'Connor and Leed Engineering & Construction has worked together delivering water and wastewater Projects. "We have worked together in the past on a number of projects, under a variety of contractual relationships. We have a good cultural fit" says Mike Hargreaves of Leed Engineering and Construction Pty Ltd. "Guidera O'Connor is a privately owned South Australian company that specialises in mechanical and electrical engineering with particular expertise in the water and wastewater sector. Leed Engineering and

Construction also has strong track record in delivering water related civil infrastructure projects so we fit well".

One of the obstacles Gold Alliance had during the construction process was to keep the existing plant operational during the works. Strategies were agreed with SA Water to ensure the construction of the works did not preclude the existing treatment stream.

"This project is a significant one for South Australian Water outer metro regional operations" says Hargreaves. We put a lot of effort into understanding the factors that were important to the Operators in order that we could drive these through the design process".

"In terms of sludge solution, we agreed an option for an anaerobic digester when we were awarded the contract. This was clearly a preferred solution which we were able to design and deliver within the budget. As part of this we were presented with a constraint of not having a flare stack which is a more traditional way of managing waste gas. South Australian Water did not want the risk of a flare stack in the Adelaide Hills so we engineered another solution".

Gold Alliance started construction in March 2010 and began commissioning it by September 2011. Overall the project is being delivered six months ahead of programme via a combination of construction efficiencies and collective management of the constraints on site," says Hargreaves.

"Our supply chain was approximately 300 suppliers and subcontractors, and around 20 of those were significant contributors".

"We put a program in place with all aspects of the job, from design, procurement, earthworks, civils, mechanical installation, electrical installation & commissioning.

"A comprehensive set of integrated project management plans was produced to provide a framework by which we successfully delivered the project."

We believe the product of the project & the spirit in which it has been delivered will be seen as a success by our our key client.

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## WASTE WATER KNOW-HOW

With more than 50 years of experience in the treatment of waste water EPCO Australia was the logical choice to help design the state-of-the art Bird in Hand Digestion project for SA Water in South Australia.

With clients that include all levels of government, statutory corporations, utilities, oil companies, mining companies, food, textile and leather producers, hotels, hospitals and tourist developments EPCO was well aware of the needs of the project and worked to provide the most efficient and economical system available.

For the Bird in Hand project EPCO designed and supplied the digester system which comprises sludge heating, sludge mixing with gas lances and the mobile gas holder roof.

“The mobile gas holder roof is for collecting methane gas and using it for heating of the sludge via a boiler. The unique thing about this site is that we were not allowed to physically flare the waste gas and had to capture the excess that wasn’t used for heating. There are still concerns over the potential for bushfires in the area after the damaging fires of a few years ago so we had to design a system where the excess gas was used to heat the water which would in turn go through a cooling radiator and circulate back through the digester system,” said Grant Cobbin, Managing Director of EPCO.

The digester uses microorganisms to break down the biodegradable material in the treatment plant.

“Digester systems are not as common as they once were. In this system the sludge comes to the digester tank on top of which is a mobile roof. The gas emitted by the digestion process builds up a pressure under the mobile roof so it can be moved to the water heating unit. The whole system is self-generating,” Mr Cobbin said.

“Eliminating the flare is quite extraordinary in these types of systems and it was an interesting exercise. It was not at all straight forward and we had to work with the client to ensure that it was right.”

The work was completed within the contract time. Although the majority of EPCO’s principal activities are centred in Australia, the company also carries out business in offshore markets. Its products are represented in Papua New Guinea, South East Asia, The Middle East, The Pacific Islands and New Zealand.

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## THE STEEL EXPERTS

F. Miller & Co. is a general engineering company which has supplied industry sectors including water treatment, chemical, mining and wine since 1945 and services all Australia from its headquarters in South Adelaide.

The charter of the company is to provide a versatile engineering service delivering high quality products and its client list reads like a portfolio of Blue Chip companies from around Australia including BHP Billiton, Lend Lease, Leighton Contractors and the Treasury Wine Group (formerly Fosters).

The company’s professional service is in line with its ISO 9001:2000 accreditation. Its fully equipped workshop can manufacture components from small stainless steel items to large tanks and bins made from stainless steel, carbon steel, aluminium and duplex stainless steel.

The Bird In Hand project required the company to complete three main areas of work the first of which was to supply and manufacture the pipe work required in the waste water treatment facility and pipe spools using grade 316 stainless steel pipes. These ranged in size from 100-400 nominal bore pipe. This work was built to AS4041 class 2B.

Secondly, it had to supply and manufacture components and items from grade 316 steel including chutes, baskets, ductwork

and brackets with all fabrication and welding done to Australian Standard AS1554.6.

The final component of the project for F. Miller was the fabrication and welding of tank access platforms and walkways including stairs and associated handrails and support structural steel.

The project involved nine people and four months. The company is now working on manufacturing and installing the pipework for water treatment projects and the manufacture of grade 316 stainless steel separation tanks for another water treatment plant.

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## A FLAWLESS REPUTATION

With a reputation of delivering projects on time and on budget BGI Building Group was a logical choice for the Gold Alliance (Leeds Engineering & Construction + Guidera O'Connor) to provide the expertise and experience to fulfill the steelwork and structural design requirements for the Bird In Hand project.

Since 1977, BGI Building Group has established an impeccable reputation for service, quality and expert advice.

BGI specialize in steel section from cold formed Cee section through to structural steel, they work extensively in fields that require challenging design and attention to detail, "We offer a complete service, from the initial concept stages right through to hand over" says Paul Brown, Civil Engineer & General Manager.

For the Bird in Hand project, BGI Building Group was responsible for all the steel work associated with the buildings including the complete fit out of the Office / administration block.

"It was essentially a design and construct project, we did all the engineering, shop drawing and fabrication in house" said Paul. "We have an extensive team of both employees and contractors who then erected and clad all the structures on site".

"As is typical with these jobs the design and erection had to suit the position, and work around the important pipe work and electrical layout of the plant" said Brown. Obviously steel was chosen for the project for its ease of construction and cost effectiveness.

Paul feels that BGI was chosen for the project because they are aware of the specific requirements of their clients and work with them to ensure the project runs smoothly. BGI also have the in house ability to design off minimum specification. BGI Building Group has also worked hard to ensure all OH&S and environment matters are dealt with prior to the project commencement.

"The site at Bird In Hand is extremely tight and we had to work closely with a large number of different contractors to ensure the buildings were erected in the small windows open to us. As with all projects the ability of the contractors and the client to have a close working relationship was essential and with Bird In Hand this was no exception as we have all worked together before on similar projects".

"It has been extremely rewarding to be part of a project that has run so smoothly, even with the site specific challenges" said Paul Brown.

BGI Building group are also currently working on a number of other projects around South Australia, including a new administration complex for Lion Nathan at St Hallett Wines, extensions to the Jacob Creek Visitors centre and an interactive Bush Garden centre in the Barossa Valley.

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