



## Preventing odour complaints

Ajman, the smallest of the seven emirates making up the UAE, has installed a new sewer network and wastewater treatment works for the city. As part of this network, one of the pumping stations was located in a built up area, where odours needed to be controlled.

ERG successfully supplied and commissioned the first of a new generation of odour control systems for use at the pumping station. This system uses the novel combination of a catalytic iron roughing filter followed by a carbon polishing filter that uses the latest water regenerable carbon technology. Thanks to the regenerable carbon, this system's operating costs are 75% lower than an odour control system using conventional impregnated carbon.

Black & Veatch, the main contractor, selected ERG as the provider for the system based on our long experience in sewage treatment odour control systems. We recommended the design using catalytic iron in the first stage filter to reduce H<sub>2</sub>S levels by 50% or more. This is followed by the water regenerable carbon filter, which has been proven at the site to reduce odour below detectable limits.

The 1 tonne of carbon media in the second stage filter is designed to perform for up to 6 months, after which it can be regenerated in the vessel via a simple process. The filter is filled with fresh water and left to soak for 30 to 60 minutes. It is then flushed through with more water and once dry it is good to perform for a further 6 months. The carbon will last for up to 8 regeneration cycles, giving 4 years of performance. This compares with a traditional caustic impregnated carbon filter that would be spent after only 6 months and would need to be completely replenished.

Water regenerable carbon is an ideal technology for the Middle East where reduced running costs and minimal operator involvement are so important in technology selection. We expect it to become widely adopted, especially as the climate is so completely suited to the regeneration cycle of warm water washing and drying.

## Chlorine gas protection

As part of a scheme to bring safe drinking water to 1.5 million people in Omdurman City, part of Greater Khartoum, the Sudanese Government commissioned Biwater International to undertake a major turnkey design and construction project.

### The challenge

Chlorine is the conventional means of water disinfection, so Biwater brought in ERG to design and manufacture an emergency gas scrubbing system.

### The solution

In the extremely unlikely event of a serious accidental chlorine leak from the storage cylinders on site, ERG's scrubber comes online and rapidly neutralises the toxic gas, guaranteeing the safety of the workforce and surrounding population. The scrubber sump tank stores enough caustic solution to deal with a worst-case scenario release of 1 tonne of chlorine.



ERG is a leading supplier of air pollution and odour control systems and services to many industrial sectors. We have a successful track record spanning more than 30 years with over 1000 of our systems in operation globally.

Our team of qualified and experienced engineers, which includes several native Arabic speakers, offer the full range of technologies, and are ready to provide cost-effective, high quality solutions to your odour control or gas cleaning problems.

We provide turn-key tailor made systems that are optimised to give the best technical result for the lowest capital and running cost, guaranteed to meet the required discharge standards. Within the Mena region, we have many plants operating in the chemicals, fertiliser and wastewater sectors.

## For more information

ERG Air Pollution Control has the knowledge to design and deliver the solution to all your odour, gas cleaning and airborne pollution challenges.

Contact our office where our engineers are ready to help.

## Gas conditioning

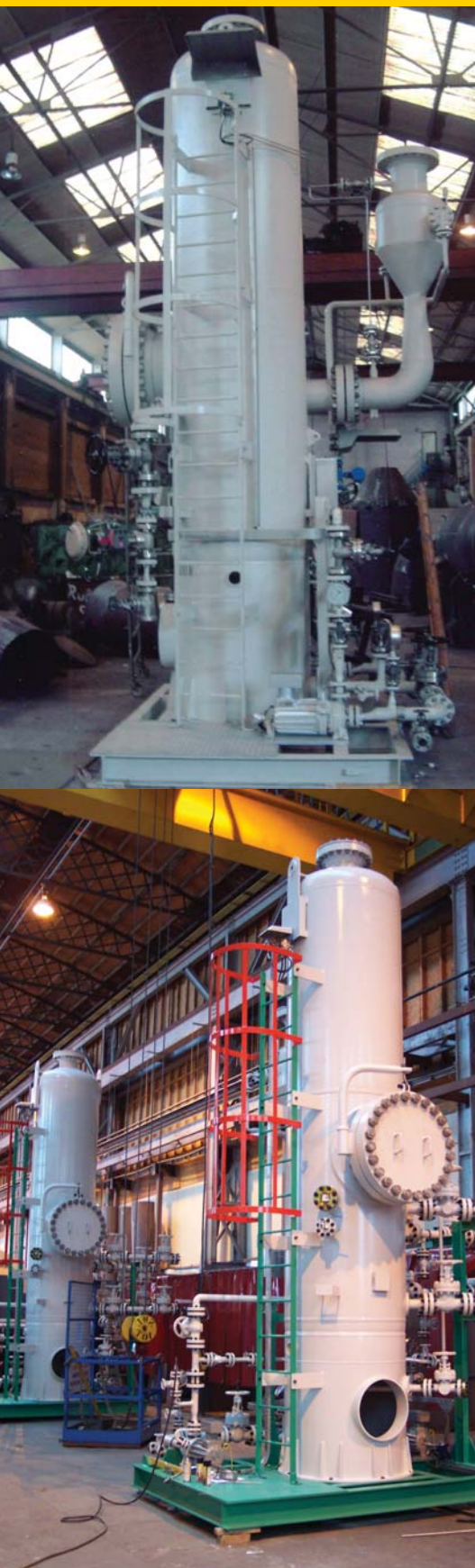


## Air pollution



## Odour control





## Protecting downstream process plant

QAFCO (the Qatar Fertiliser Company) operates the world's largest ammonia and urea production site at Mesaieed City, Qatar. The QAFCO 5 expansion project is a \$3.2 billion investment to expand capacity to help meet the increased demand from agriculture. It is scheduled to come on stream in 2011.

### The challenge

Each of the QAFCO plants uses highly explosive high-pressure natural gas from offshore as the principal raw material for the ammonia and urea production. However the natural gas is contaminated with  $H_2S$  that corrodes the pipework, and entrained particles that form scale. These contaminants must be removed from the gas stream prior to downstream processing.

### The solution

To accomplish this critical gas cleaning role, ERG has supplied two specially designed high-pressure venturi scrubbers to remove >99.5% of particulates. The QAFCO 5 scrubbers are constructed from 25mm thick 316L stainless steel and certified to 48 bar, ASME VIII Div 1. Each system is capable of conditioning 90,000Nm<sup>3</sup>/hr of gas. This successful installation follows the earlier QAFCO plants 1 to 4, which also included high pressure venturi scrubbers provided by ERG's wholly-owned subsidiary APC Process Engineering.

Each system incorporates a venturi scrubber and dis-entrainment vessel with a built-in mist eliminator. The venturi is fed with scrubbing liquor from the vessel's integral sump tank by duty and standby recirculation pumps.

The systems are supplied skid-mounted complete with ladder access, and are fully piped, wired and tested prior to dispatch.

**Air pollution can take many forms, from process gas and flue gases to particulates suspended in air flows. Our capabilities cover both wet and dry chemical scrubbers, variable throat venturi and sieve tray towers as well as the V-tex® vortex scrubbing system.**

**Whatever the contaminant, ERG has the process solution.**



**APC Process Engineering Limited**  
A wholly-owned subsidiary of ERG (Air Pollution Control) Ltd

## Protecting the environment

### The challenge

Mindful of the harmful impact of fluorine compounds on health and the environment, the Bradley Pulveriser Company needed to incorporate a gas scrubbing system into the design of a new fertiliser production facility. At Aswan Fertiliser and Chemical Company's new Aswan site in Egypt, which produces 1600 tonnes per day of fertiliser, phosphate-containing rock is crushed and mixed with acid, releasing large quantities of  $SIF_4$  gas and particulate.

### Solution

Through its subsidiary APC Process Engineering, ERG supplied a venturi scrubber and spray tower to capture the dust, before hydrolysing and scrubbing the fluorine compounds from the process air. The open design of the venturi prevents clogging due to the build-up of gelatinous silica, produced by the reaction taking place in the scrubbing liquor. The system is designed to minimise effluent, operating at a high dissolved solids concentration, and returning the waste liquors to the manufacturing process to enhance the nutrients in the product fertilizer, thus reducing the volume of waste water to be treated. This is one of three similar plants supplied, all of which remove fluorine compounds to below the required limits.

The scrubber unit is constructed from polypropylene/GRP and the spray nozzles from Hastelloy C276.

## Capturing vent gas emissions

Tengizchevroil, which is a joint venture between Chevron, Exxon Mobil, and local Kazakhstan operators KazMunaiGas and LukArco, needed a scrubber to treat hydrogen chloride fumes given off from a 50m<sup>3</sup> hydrochloric acid storage tank.

### The challenge

ERG had to meet some very strict parameters. Tengizchevroil required a discharge standard of <2ppm HCl and specified a design temperature range of -40°C to +75°C to allow for extreme Kazakh weather conditions, with a 6 bar design pressure.

### The solution

Under normal operation, the concentration of HCl in the extracted fumes is 130,000ppm, but this can rise to in excess of 500,000ppm at the extreme operating limits. The ERG designed scrubber reduces the HCl content down to less than 2ppm - an impressive removal efficiency of more than 99.999%.

The key part of the system is a packed tower scrubber which uses water to capture fumes expelled as the storage tank is filled. The scrubber is mounted on a Derakane 470 GRP 3.4m<sup>3</sup> recirculation tank, and along with a PTFE lined recirculation pump and associated PFA lined pipe-work, the complete system is supplied on a 304L stainless steel skid.

The scrubber package was fully assembled and tested at ERG's UK base before being shipped by road to the site, 2,000 miles away.

