

<b>NATIONAL GRID TERM CONTRACT</b>	
<b>Description:</b>	Remediation of former gasworks
<b>Form of Contract:</b>	ICE 7 <sup>th</sup> Edition
<b>Duration:</b>	April 02 to date (Nov 08) and ongoing
<b>Contract Value:</b>	Confidential
<b>Client:</b>	National Grid Property Holdings
<b>Clients Representative:</b>	Various

This twice-renewed contract encompasses the remediation of former gasworks throughout Scotland and has seen us undertake 34 projects to date. The term contract approach is one which fits well with our company ethos.

Early involvement of all project stakeholders is a strong feature in National Grid contracts. This allows I & H Brown to play an active role in building constructive relationships with local regulators throughout the project, from early planning stage through the construction phase to final validation. We have also contributed the contractor's insight into project scoping, health & safety and cost planning. Such an approach helps to ensure that everyone's requirements are considered and satisfied, and assists in the smooth running of the project.

In addition to the top priority placed on health and safety, the project teams also place strong emphasis on aspects such as community relations, environmental management and the quality of the site end-condition. Regular site audits, covering all aspects of site management, are undertaken to monitor compliance.

Project objectives focus on removal of potential sources and pathways of contamination by means of selective excavation, sentencing and predominantly minimising the volume of material consigned for off site disposal to landfill; thus maximising the volume that can be retained for re-use on site.

We routinely adopt a detailed selective dig approach, with large volumes of material being crushed and screened prior to recovery, and now more often than not being introduced to further on-site treatment processes. An intensive sampling and analysis programme is also undertaken to ensure that all materials (pre and post treatment) are suitable for use.

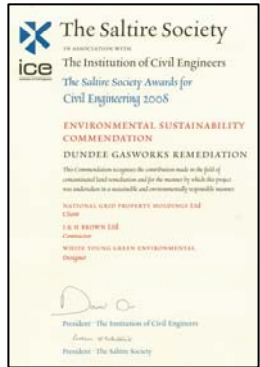
Every effort is made to reduce material sent to landfill. We have amassed extensive experience of a variety of pre-treatment techniques, including ex-situ bioremediation, soil washing, solidification/stabilisation, thermal desorption and water treatment. We have helped to promote innovation, such as the first commercial uses of soil washing and thermal desorption in Scotland and the first use nationally of sea transport for off-site disposal.

This page overleaf contains outline descriptions of a number of typical projects carried out under the term contract. Detailed individual Case Studies are available on request.



**Dundee and Leven Gasworks**

In summer of 2006, we excavated, screened and crushed material at Dundee to provide a suitable feedstock for treatment by **thermal desorption**. This process, still new to the UK, was successfully completed in 2007. The project extended to encompass Leven Gasworks in the first UK realisation of the Cluster Site concept. All of the 38,000m<sup>3</sup> of contaminated material was re-used on site. The scheme won an Environmental Sustainability Commendation in the Saltire Society Civil Engineering Awards 2008.



**Dumbarton Gasworks**

Contamination, predominantly comprised of coal tars and heavy hydrocarbons, was addressed by a combination of physical pre-treatment and **ex-situ bioremediation**, using our own resources.

**Buckie Gasworks**



Over 5,000m<sup>3</sup> of material required excavation and off-site disposal. Of this, over 1,000m<sup>3</sup> was classified as hazardous, with the nearest suitable landfill 350 miles away. We used **sea vessels** to transport material to landfill. Excavated materials were screened several times, down to 20mm. Oversize material was analysed to ensure its suitability for re-use on site, with contaminated fines tested to guarantee accurate waste classification. This reduced material disposal volumes by 30%.

**Elgin Gasworks**

**Soil washing** was adopted to address hydrocarbon contamination resulting from the sites former gasworks use. Its application was instrumental in achieving the on-site reuse of up to 90% of 8,500m<sup>3</sup> of excavated materials. On-site water treatment system allowed contamination in groundwaters to be managed such that waters were suitable for discharge to foul sewer



**Dundee Gasworks**

During the excavation of 10,000m<sup>3</sup> of contaminated gasworks waste from within 8m-deep former gasholder bases, an on-site **water treatment** system was used to treat 1,250m<sup>3</sup> of perched groundwater encountered within the below ground structures, allowing disposal to foul sewer network and minimising the need for tanker disposal. Similar water treatment is routine on many of these projects.

**Dunfermline Gasworks**

**Selective digging, sorting and screening** processes were used to ensure that of a total 30,500m<sup>3</sup> of excavated materials, only 10,500m<sup>3</sup> was disposed off-site with the remainder suitable for on-site reuse as backfill. In combination with a scheme in Glasgow, this project was awarded National Grid Transco Chairman's Award for Safety, Health and Environment.

