



**Remediation Statement**

**25-71 Joss Street, Invergordon**

**Part IIA of the Environmental Protection Act 1990**



**February 2009**

## Contents

1. Introduction.....	2
2. The Site .....	3
3. Description of Significant Pollutant Linkage.....	4
4. Name and Address of Remediation Contractors .....	5
5. Remediation Summary .....	6

	Name	Signed	Date
Record Prepared By	Esther MacRae Scientific Officer		February 2009
Record Checked By	Dr Anthony Luke Principal Contaminated Land Officer		February 2009

This Remediation Statement should be read in conjunction with the Record of Determination of Contaminated Land for the site, prepared in June 2006.

## 1. Introduction

Powers and duties with respect to land contamination were conferred on Local Authorities when the Contaminated Land Regime came into force with the Contaminated Land (Scotland) Regulations 2000. The legislative basis for the regime is contained in Part IIA of the Environmental Protection Act 1990 (inserted by s57 of the Environment Act 1995). The Regime has since been updated by The Contaminated Land (Scotland) Regulations 2005. Statutory Guidance is available published by the Scottish Executive in May 2006.

The above legislation provides the following definition of contaminated land:

“Contaminated land” is any land which appears to the local authority in whose area it is situated to be in such a condition, by reason of substances in, on or under the land, that –

- (a) significant harm is being caused or there is a significant possibility of such harm being caused;
- or
- (b) significant pollution of the water environment is being caused or there is a significant possibility of such pollution being caused

Highland Council on 1<sup>st</sup> June 2006 identified land at 25-71 Joss Street, Invergordon as contaminated land.

This Remediation Statement has been prepared pursuant to section 78H (7) of the Environmental Protection Act 1990 and Section 14 Schedule 4 of the Contaminated Land (Scotland) Regulations 2000. The Remediation Statement contains:

- the location and extent of the land sufficient to enable it to be identified;
- the significant harm or pollution of controlled waters by reason of which the contaminated land in question is contaminated land;
- the substances by reason of which the contaminated land in question is contaminated land and, if any of the substances have escaped from other land, the location of that other land;
- the current use of the contaminated land in question;
- the name and address of the person who it is claimed has done each of the things by way of remediation;
- a description of anything which it is claimed has been done by way of remediation; and
- the period within which it is claimed each such thing was done.

## 2. The Site

The site was formerly a town gasworks which was redeveloped as two blocks of mainly local authority owned flats totalling 24 in number, landscaped and car parking areas. The area of the site is delineated in red in the below Site Location Plan.

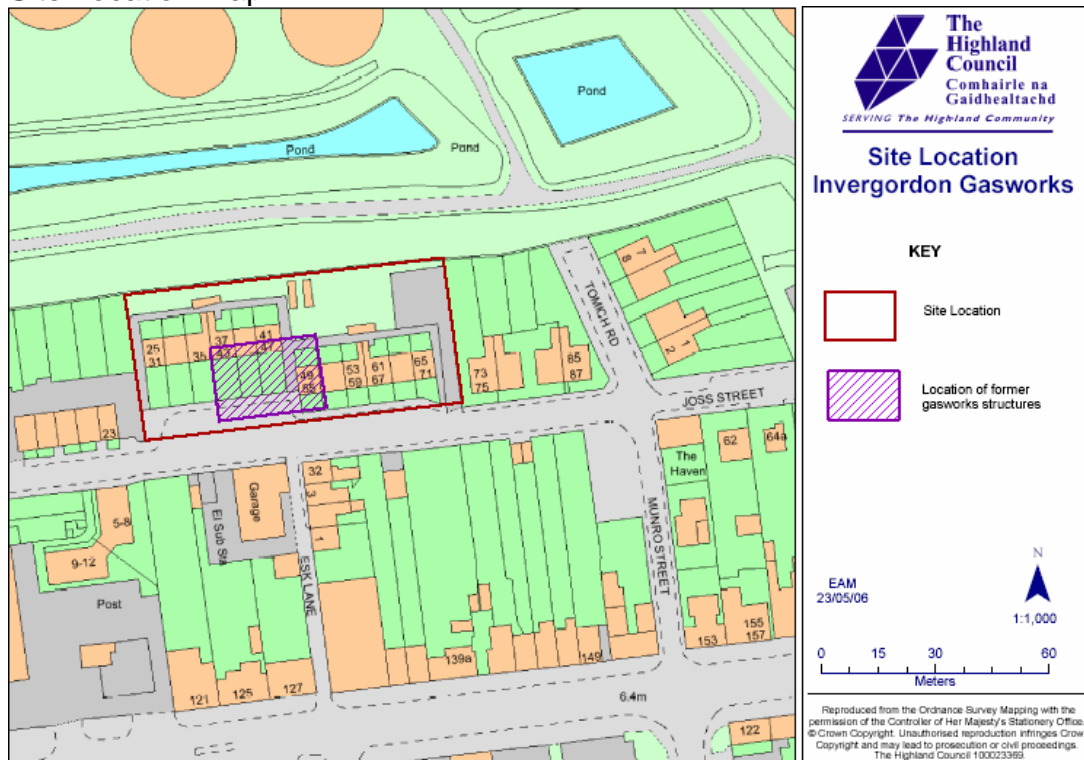
Site Address: 25-71 Joss Street  
Invergordon  
IV18 0AP

Area: 0.31ha (total); Area of Former Gasworks structures: 0.06ha

NGR: 270963, 868700

Current Use: Unoccupied; previous to August 2007 the site was Residential

### Site Location Map



### 3. Description of Significant Pollutant Linkage

A pollutant linkage is defined in the Statutory Guidance as a linkage between a Contaminant and a Receptor, by means of a Pathway. It is considered that the following significant pollutant linkage was present at Joss Street:

Contaminant	Pathway	Receptor
Poly-cyclic Aromatic Hydrocarbons, in particular the risk driver at the site – Benzo (a) Pyrene	Ingestion of soil (indoor and outdoor) Dermal contact with soil (indoor and outdoor)	Residents at the site – the most vulnerable of which are assessed to be females in the 0-6 year age group.

Based on this linkage, the site was identified as Contaminated Land on 1<sup>st</sup> June 2006 due to **significant possibility of significant harm to human health.**

#### **4. Name and Address of Remediation Contractors**

The Highland Council appointed IKM Consulting Ltd as the Project Manager. I&H Brown Ltd were appointed as the Principal Contractor.

IKM Consulting Ltd Park House 39 Bo'ness Road Grangemouth Stirlingshire FK3 8AN	I&H Brown Ltd PO Box 51 Dunkeld Road Perth PH1 3YD
--	--

The following reports have been prepared which give a full description of the remediation, and can be viewed at the Highland Council headquarters:

- Site Remediation and Design Strategy. IKM Consulting, September 2006.
- Site Remediation Report. IKM Consulting, November 2008.

## 5. Remediation Summary

The following summary has been taken from the IKM November 2008 report. The remediation was carried out between 13 August 2007 and 16 November 2007.

### Demolition Works

- A dilapidation survey was carried out of the existing site buildings and neighbouring buildings.
- Soft stripping of the internal fabric and potentially hazardous materials of the site buildings was undertaken prior to main demolition works.
- Gable ends and roofing joists were removed prior to demolition works to reduce the risk of damage to neighbouring properties.
- The buildings were demolished by a mechanical claw, each being demolished in on itself to prevent damage to neighbouring properties.
- Resulting demolition material was segregated and disposed of to off site facilities.
- Concrete and masonry demolition rubble was sent to a local quarry for crushing and processing, and was subsequently re-used as backfill material.

### Delineation Works

- The desk top delineation plan was used to identify potentially hazardous areas and to carry out a programme of trial pitting to delineate the extent of contaminated soils on site.
- The contaminated area was noted to be in excess of that anticipated in the desk top assessment and to extend to depths greater than that indicated in the previous site investigations.
- The extent of the contaminated area was identified and validated with laboratory testing.
- Additional trial pits were undertaken below the footprint of the former buildings outwith the contaminated area in order that an assessment of these soils could be undertaken.

### Soil Remediation Works

- Panels of contaminated soils were sequentially excavated and stockpiled for off site disposal.
- On site testing to allow the assessment of contamination was undertaken, so controlling the extent of remediation works.
- As sections of contaminated area were excavated, validation samples of the walls and base of excavations were collected for analysis.
- Additional on site testing to allow the segregation of hazardous and non-hazardous waste streams was carried out.
- Material within the buried gas holder was identified as asbestos hazardous waste and was excavated separately and disposed of appropriately.

- The gasometer was found to be watertight and was used to temporarily contain groundwater encountered during remediation works, the gasometer was subsequently removed.
- Groundwater was removed by a local waste water contractor and disposed of in an appropriate manner.
- Due to the potential destabilisation of Joss Street and the presence of a live gas main, a strip approximately of land 2m wide by 30m long remained partially un-remediated on the southern boundary of the site. Partial excavations were carried out in this area to create a protective batter and to remove as much material as possible.
- The remediation comprised the removal of all surface soils to 1m below ground level, and the delineation and excavation of a localised area of contamination around the former location of the gasworks structures in the centre and west of the site. The depth of excavation in this area extended to between 3.5m and 4.5m below ground level. The table below records the volumes of material removed from site and the destination landfill.

Waste Classification	Volume (tonnes)	Landfill Site
Inert Waste	5,400	Caplich Quarry, Alness
Non-hazardous Waste	174	Avondale Landfill, Polmont
Hazardous Waste (asbestos)	146	Avondale Landfill, Polmont
Hazardous Waste (general)	2,410	Avondale Landfill, Polmont

### Backfilling & Reinstatement

- The processed demolition rubble from the demolition of the flats was imported to site and used as backfill in the deeper excavations.
- As the required volume of backfill material exceeded that available from the crushing of the buildings, additional, similar material was imported from a local source.
- The area of unremediated soil along the southern boundary of the site is entirely covered by the re-instated carriageway and associated carparking. Samples of the unremediated soil were taken for chemical analysis.
- Samples of the backfill and proposed topsoil material were collected for chemical and geotechnical analysis.
- Compaction of the backfill was undertaken in keeping with the specification prescribed by IKM Consulting Engineers and the Department of Transport Specification for Highway Works, Part 2, Series 600.
- Geotechnical analysis of the imported backfill material indicated the materials were in accordance with the Highways Specification for a Class 1A General Fill.
- A 150mm thick mantle of topsoil was imported to finish the site to surrounding site levels. This was seeded and turned in the spring of 2008.



## **Post Remediation Risk Assessments**

- All results were considered in a post remediation detailed quantitative risk assessment. Using additional data from the remediation works, a post remediation conceptual site model was prepared and the screening criteria established in the project strategy document were revised to allow the comparison of validation samples and residual soil conditions.
- Where screening criteria for human health were not available these were calculated in a detailed risk assessment using the RISC 4 programme.
- A series of detailed risk assessments using the CONSIM and EA Remedial targets methodology were completed, to assess the risks to the water environment from residual contaminants within the soils and backfill.
- The risk assessment confirmed, that the underlying soils do not present a significant possibility of significant harm to human health.
- The risk assessment confirmed, that the underlying soils do not present a significant possibility of significant pollution of the water environment. As part of this assessment IKM do not consider that the tests of significance (with the exception of those tests that cannot yet be answered) with regard to pollution of the water environment from residual soil contaminants are being realised at the compliance point adjacent to the site.

## **Site Status & Future Works**

- The site remains clear of structures and has been levelled in keeping with its surrounds.
- The site has been protected by the installation of palisade fencing encompassing all sides of the site. Double access gates are located on Joss Street.
- The site has been backfilled and compacted in general accordance with the specification for Highways. Future developers should undertake a geotechnical assessment to satisfy themselves with regard to soil properties, load bearing requirements and foundation designs.
- The post remediation conceptual site model (CSM) should be made available to developers, the planning authority, utility companies and local road maintenance departments in order that they can make provisions for protecting their workforce and locating site services accordingly.

## **Conclusion**

It is IKM Consulting's opinion that the site has been appropriately remediated in keeping with the agreed remedial strategy and does not pose a significant possibility of significant harm to human health or the significant possibility of significant pollution to the water environment post remediation.

Highland Council is satisfied that the remediation work specified in this Remediation Statement has been carried out. The significant pollutant linkage which formed the basis of the site being identified as Contaminated Land has been removed.