

**The Highland Council
Local Air Quality Detailed Assessment 2005**

**TEC Services
October, 2005**

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1 INTRODUCTION

Part IV of the Environment Act 1995 introduced Local Air Quality Management, whereby local authorities have a statutory duty to carry out reviews and assessments of local air quality from time to time. Local Air Quality Management has an important role in helping to deliver the air quality objectives which are set out in the Air Quality Strategy for England, Scotland, Wales and Northern Ireland (January 2000) and the Air quality (Scotland) Regulations 2000 (as amended).

The first Review and Assessment of Air Quality in Highland was completed in 1998.
A Local Air Quality Updating and Screening Assessment was produced in June 2003
A Local Air Quality Progress Report was published in June 2005.

The Local Air Quality Updating and Screening 2003 identified that a Detailed Assessment would have to be carried out.

Benzene. The screening assessment indicated that the running annual mean air quality objective for Benzene may be exceeded

- (a) in the vicinity of petrol terminals at Inverness harbour, and
- (b) near the Talisman Energy UK Ltd, Nigg Oil Terminal petroleum refining process at Nigg.

Sulphur Dioxide. The screening assessment indicated that:-

- (a) there was a risk that the 15 minute mean air quality objective for SO₂ could be exceeded in Castletown in Caithness as a result of the density of dwellings which burn solid fuel, and
- (b) a Detailed Assessment would need to be carried out in respect of the ALCAN Aluminium Smelter in Fort William as the number of stacks which emit SO₂ at that site, did not lend themselves to simple screening techniques.

Nitrogen dioxide. Both the Scottish Executive and the Scottish Environment Protection Agency voiced concern over levels of NO₂ in Inverness City Centre as measured by passive diffusion tube and so a Detailed Assessment was also undertaken for Nitrogen dioxide.

2 Benzene

The Local Air Quality Upgrading and Assessment 2003 report concluded that a detailed assessment of benzene emissions was required in the vicinity of the petrol terminals at Inverness harbour and the Talisman Energy (UK) Ltd petroleum refining process at Nigg in Easter Ross.

Monitoring by passive diffusion tube was undertaken at Lotland Street, Inverness and at Nigg. The location of the diffusion tubes are shown in the maps in APPENDIX 1 and APPENDIX 2. The monitoring commenced in March 2004 and the diffusion tubes were exposed on a monthly basis.

Details of Diffusion Tube Sampling Method and Analysis are shown in Figure 1

Figure 1 Details of Diffusion Tube Sampling Method and Analysis

Benzene	
Sampling Method	Sampling is carried out following the guidance contained with the Instruction manual for exposure and location of Passive Diffusion Air Monitors supplied by Gradko International Ltd.
Analytical Laboratory	Gradko International Ltd
Accreditation	Diffusion tubes are tested within the scope of Gradko International Ltd. Laboratory Quality Procedures. The Laboratory analytical method is accredited by UKAS.
Type of Tube	Chromasorb 106
Absorbent/Tube preparation method	Chromasorb
Limit of Detection	2.80 ng
Uptake Rate	1.28 ng.ppm-1min-1

A field (transport) blank benzene diffusion tube was submitted with each tube exposed at the Nigg site. All results for RC5 – Nigg have therefore been blank subtracted. The results for Lotland Place are not blank subtracted.

Figure 2 details the results obtained over a 12 month period from March 2004 to February 2005.

Figure 2 Benzene diffusion tube monthly results 2004 -2005

Exposure Month	Nigg	Lotland Street
2004-Mar	0.28	0.49
2004-Apr	0.40	0.51
2004-May	0.37	0.48
2004-Jun		0.36
2004-Jul	0.12	0.34
2004-Aug	0.17	0.29
2004-Sep	0.1	0.3
2004-Oct	0.16	0.68
2004-Nov	0.21	0.71
2004-Dec	0.13	0.39
2005-Jan	0.14	0.56
2005-Feb	0.22	0.52
12 Month Mean Concentration	0.21	0.47

2.1 Conclusion for Benzene

The air quality objectives for Benzene are shown in Figure 3

Figure 3 Air quality objectives for Benzene

Pollutant	Air Quality Objective		Date to be achieved by
	Concentration	Measured as	
Benzene All authorities	16.25 µg/m ³	running annual mean	31.12.2003
Authorities in Scotland and Northern Ireland only	3.25 µg/m ³	running annual mean	31.12.2010

Although the annual mean obtained by passive diffusion tube cannot be compared directly with the 2003 air quality objective of 16.25 µg/m³ the diffusion tube levels are low enough to conclude that the air quality objective is being met and that the 2010 objective of 3.25 µg/m³ running annual mean will also be met in Highland Council areas.

3 Sulphur dioxide

The Highland Council contracted netcen to carry out measurements of air quality at three locations in the region, for a period of six months. The netcen report summarises the results from this study, and provides a comparison with the National Air Quality Objectives as set out by defra and the Scottish Executive.

The programme included the following monitoring sites:

- Fort William, Lochaber Sulphur dioxide, SO₂ Wind speed and direction
- Castletown, Caithness Sulphur dioxide, SO₂

The results from the sites show that no relevant air quality standards for SO₂ were exceeded during the period 8 December 2004 to 30 June 2005.

The netcen report AEAT/Env/R/2005/Issue 1 August 2005 is reproduced in full at APPENDIX 3

3.1 Conclusion for Sulphur dioxide

The air quality objectives for Sulphur dioxide are shown in Figure 4

Figure 4 Air quality objectives for Sulphur dioxide

Pollutant	Air Quality Objective		Date to be achieved by
	Concentration	Measured as	
Sulphur dioxide	266 µg/m ³ not to be exceeded more than 35 times a year	15 minute mean	31.12.2005

The Detailed Assessment indicates that the air quality objective for Sulphur dioxide (that the 15 minute mean of 266 µg/m³ should not to be exceeded more than 35 times a year) is being met in the Highland Council area.

4 Nitrogen dioxide

The Highland Council contracted netcen to carry out measurements of air quality at three locations in the region, for a period of six months. The netcen report summarises the results from this study, and provides a comparison with the National Air Quality Objectives as set out by defra and the Scottish Executive.

The programme included the following monitoring site:

- Inverness city centre Nitrogen dioxide, NO₂

The results from the sites show that no relevant air quality standards for NO₂ were exceeded during the period 8 December 2004 to 30 June 2005.

The netcen report AEAT/Env/R/2005/Issue 1 August 2005 is reproduced in full at APPENDIX 3

4.1 Conclusion for Nitrogen dioxide

The air quality objectives for Nitrogen dioxide are shown in Figure 5

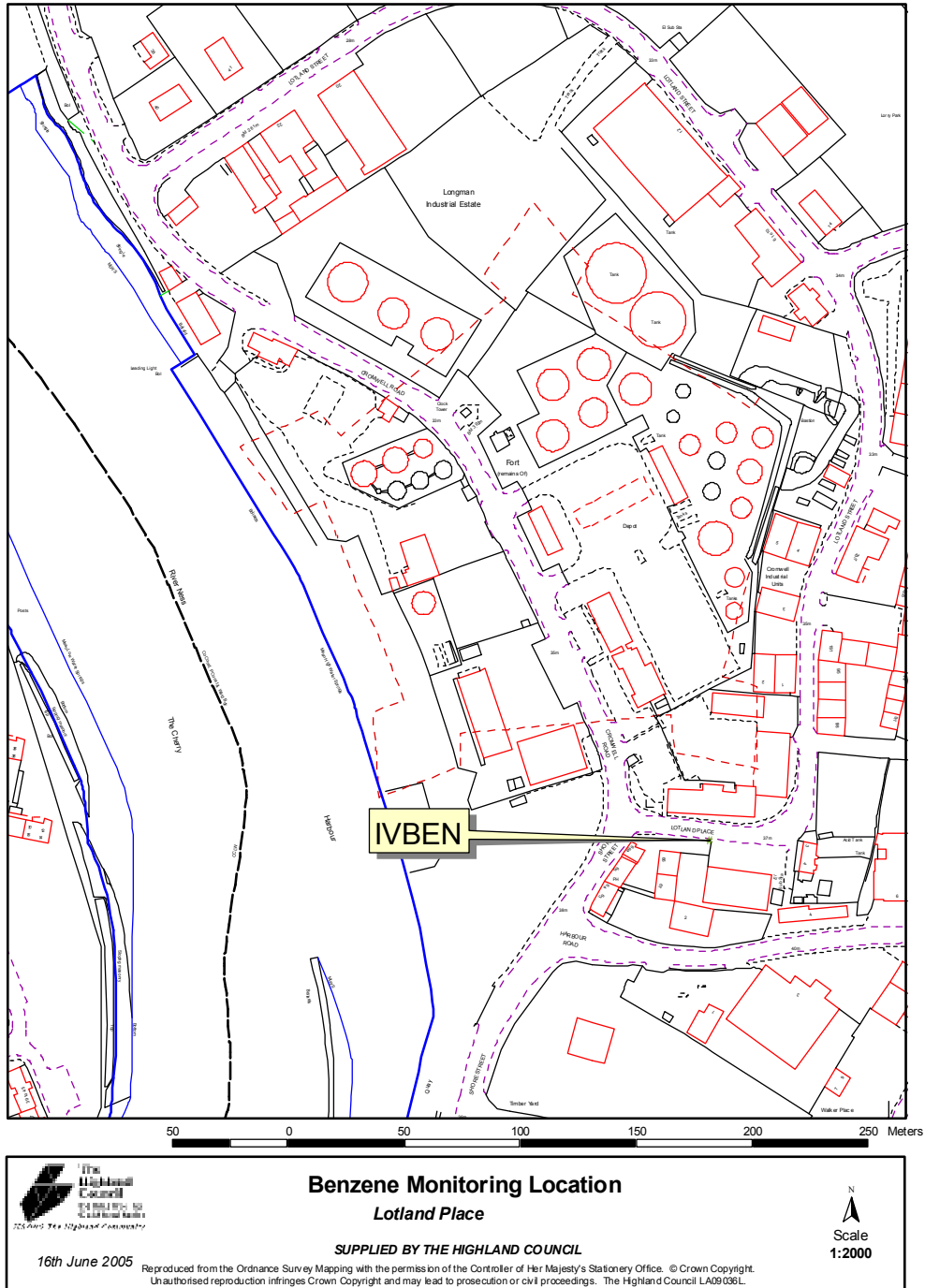
Figure 5 Air quality objectives for Nitrogen dioxide

Pollutant	Air Quality Objective		Date to be achieved by
	Concentration	Measured as	
Nitrogen dioxide	200 µg/m ³ not to be exceeded more than 18 times a year	1 hour mean	31.12.2005
	40 µg/m ³	annual mean	31.12.2005

The Detailed Assessment indicates that the air quality objectives for Nitrogen dioxide are being met in the Highland Council area.

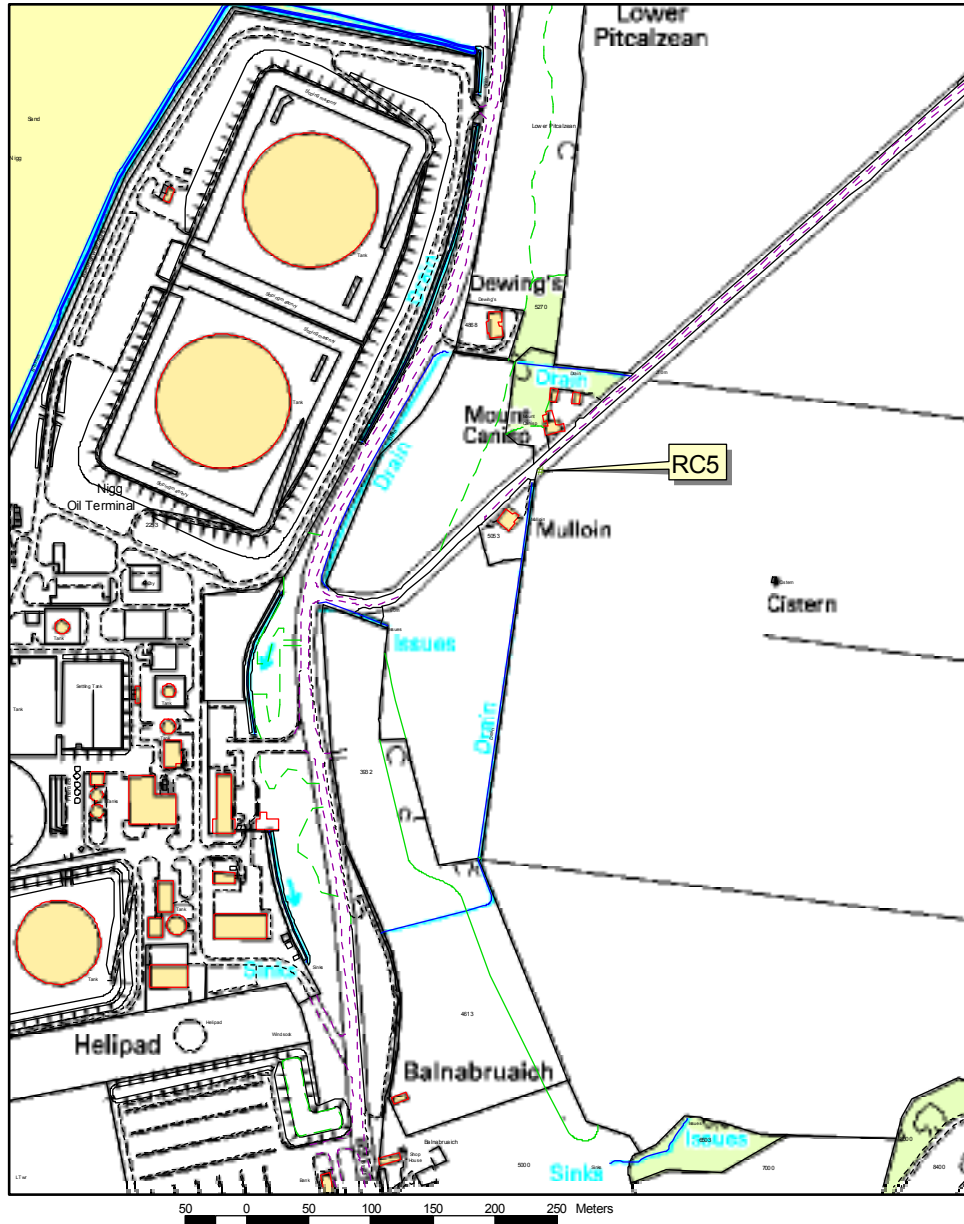
5 APPENDIX 1

Benzene diffusion tube location – Lotland Street, Inverness



6 APPENDIX 2

Benzene diffusion tube location – Nigg



Benzene Monitoring Location
Nigg Oil Terminal

SUPPLIED BY THE HIGHLAND COUNCIL

16th June 2005

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7 APPENDIX 3 Air Quality Monitoring: Report to Highland Council -AEAT/Env/R/2005/Issue 1 August 2005