

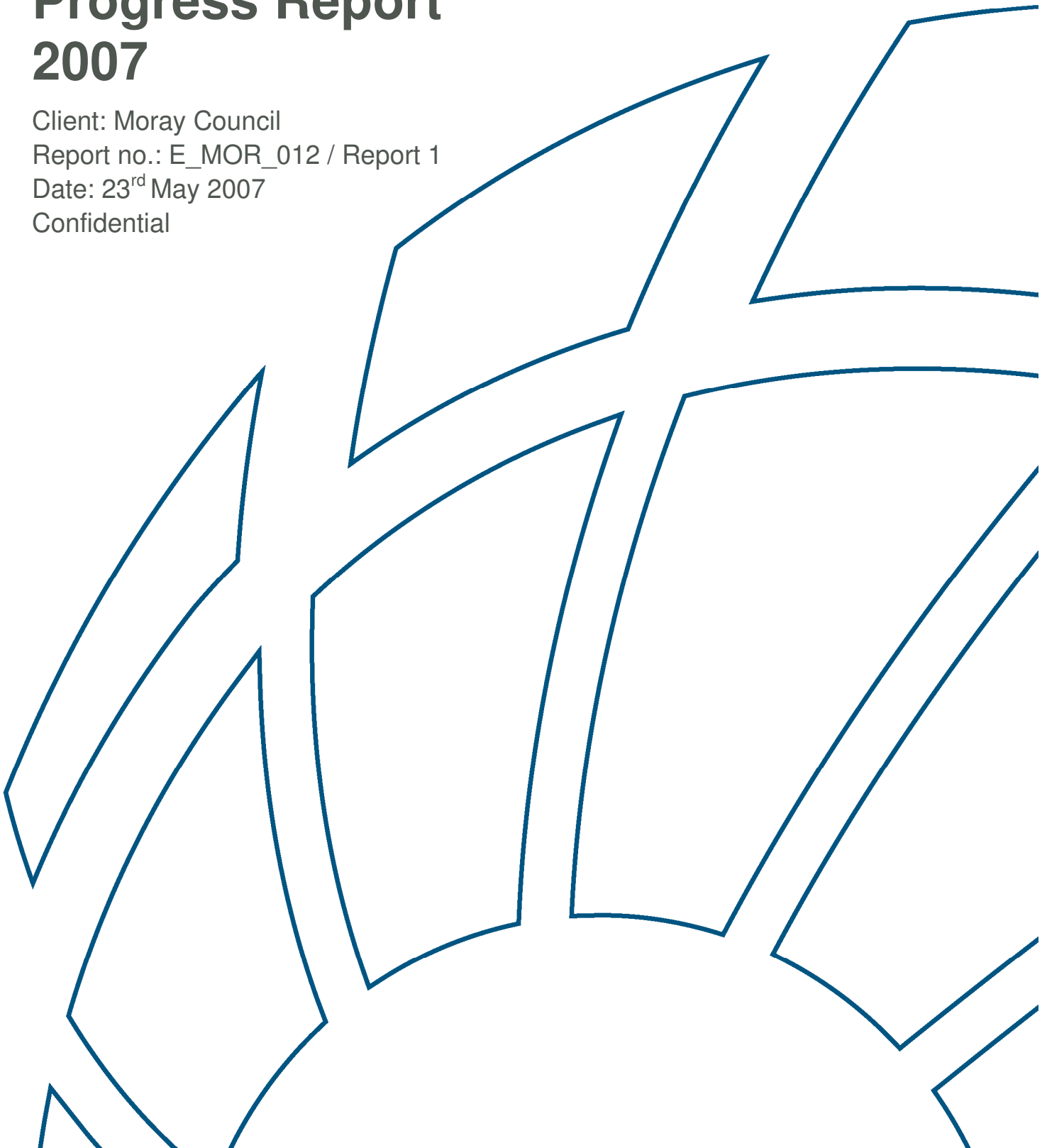
Local Air Quality Management Progress Report 2007

Client: Moray Council

Report no.: E_MOR_012 / Report 1

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1 INTRODUCTION

BMT Cordah Ltd has been commissioned by Moray Council to carry out the 2007 Local Air Quality Management (LAQM) Progress Report. The report has been completed in collaboration with personnel from Moray Council.

1.1 Purpose

The aim of the report is to provide details of air quality monitoring undertaken by the Council since the 2006 assessment and identify any changes to local policy and atmospheric emission sources that will impact local air quality.

The assessment uses updated information for industrial, transport, commercial and domestic atmospheric emissions combined with current monitoring data to identify if there is potential for exceedence of the air quality objectives contained within the Air Quality Strategy for England, Scotland, Wales and Northern Ireland 2000 (NAQS)¹.

The report follows guidance set out in LAQM.TG(03) technical guidance², LAQM.PRG(03) progress report guidance³, LAQM.PG(03) policy guidance⁴ and subsequent guidance amendments⁵.

1.2 Review and Assessment process

The Environment Act 1995 and subsequent regulations require local authorities to assess compliance of air quality in their area with the standards and objectives set out in the NAQS. For local authorities within Scotland further regulations are set out in the Air Quality (Scotland) Regulations 2000 and Air Quality (Scotland) Amendment Regulations 2002.

The LAQM framework requires that local authorities carry out regular reviews of air quality. The Review and Assessment process comprises two phases. The first phase of the Review and Assessment is an Update and Screening Assessment (U&SA). The U&SA considers any changes that have occurred in pollutant emissions and sources since the last round of Review and Assessment that may affect air quality. The second phase is either a Detailed Assessment or a Progress Report depending upon the outcome of the U&SA.

¹ The Air Quality Strategy for England, Scotland, Wales and Northern Ireland, Working together for clean air, Defra, January 2000.

² Part IV of the Environment Act 1995, Local air quality management technical guidance, LAQM.TG(03), Defra et al, January 2003.

³ Part IV of the Environment Act 1995, Local air quality management progress report guidance, LAQM.PRG(03), Defra et al, January 2003

⁴ Part IV of the Environment Act 1995, Local air quality management policy guidance, LAQM.PG(03), Defra et al, January 2003.

⁵ Part IV of the Environment Act 1995, Local air quality management technical guidance update, LAQM.TG(03) – update: January 2006, Defra et al, January 2006 and Part IV of the Environment Act 1995, Local air quality management policy guidance: Addendum, LAQM.PGA(05), Defra et al, January 2005

The Review and Assessment process requires that where a risk of exceedence of an air quality objective at a location with relevant public exposure is identified then a Detailed Assessment is required. A Detailed Assessment considers any risk of exceedence of an objective to greater depth in order to determine whether it is necessary to declare an Air Quality Management Area (AQMA).

An AQMA is required to be declared where it is shown that an air quality objective has been or is predicted to be exceeded by the objective deadline.

1.3 Assessment criteria

The NAQS details assessment criteria for eight pollutants in the form of atmospheric concentration levels for which an objective deadline is set. The NAQS objectives for applicable in Scotland are presented in Table 1.

Table 1: Air quality objectives outlined in the NAQS and Air Quality Regulations

Pollutant	Concentration	Measured as	Equivalent percentile	Date to be achieved by
Benzene	16.25 $\mu\text{g}/\text{m}^3$	running annual mean	-	31/12/2003
	3.25 $\mu\text{g}/\text{m}^3$	running annual mean	-	31/12/2010
1,3-butadiene	2.25 $\mu\text{g}/\text{m}^3$	running annual mean	-	31/12/2003
Carbon monoxide (CO)	10 mg/m^3	running 8 hour mean	-	31/12/2003
Lead	0.5 $\mu\text{g}/\text{m}^3$	annual mean	-	31/12/2004
	0.25 $\mu\text{g}/\text{m}^3$	annual mean	-	31/12/2008
Nitrogen dioxide (NO ₂)	200 $\mu\text{g}/\text{m}^3$ not to be exceeded more than 18 times per year	1-hour mean	99.79 th percentile of 1-hour means	31/12/2005
	40 $\mu\text{g}/\text{m}^3$	annual mean	-	31/12/2005
Particulate (PM ₁₀)	50 $\mu\text{g}/\text{m}^3$ not to be exceeded more than 35 times a year	24-hour mean	90.4 th percentile of 24-hour-means	31/12/2004
	40 $\mu\text{g}/\text{m}^3$	annual mean	-	31/12/2004
	50 $\mu\text{g}/\text{m}^3$ not to be exceeded more than 7 times a year	24-hour mean	98 th percentile of 24-hour-means	31/12/2010
	18 $\mu\text{g}/\text{m}^3$	annual mean	-	31/12/2010
Sulphur dioxide (SO ₂)	125 $\mu\text{g}/\text{m}^3$ not to be exceeded more than 3 times a year	24-hour mean	99 th percentile of 24-hour means	31/12/2004
	350 $\mu\text{g}/\text{m}^3$ not to be exceeded more than 24 times a year	1-hour mean	99.7 th percentile of 1-hour means	31/12/2004
	266 $\mu\text{g}/\text{m}^3$ not to be exceeded more than 35 times a year	15-minute mean	99.9 th percentile of 15-minute means	31/12/2005

1.4 Moray Council area

The Moray Council area is located on the north-east coast of Scotland between Inverness and Aberdeen. The council area is bordered to the south and east by Aberdeenshire Council and to the north and west by Highland Council. The northern border of the Moray Council area is the Moray Firth and the North Sea coast. A map detailing the Moray Council area is presented in Figure 1 in Appendix 1.

The Spey valley divides the northern part of the council area in a south-west to north east direction. The southern half of the council area is dominated by the glens of the Grampian mountain range and includes large areas of forest and moorland. The northern part of the council area is relatively flat with large expanses of agricultural and coastal land.

As is the case for the majority of the UK there is a dominance of south-westerly winds, although there is a significant proportion of easterly winds and south-easterly winds indicating the influence of weather systems in the North Sea and Moray Firth. The mean temperature is approximately 8°C in the lowland areas but below 7°C in the upland areas in the south. The area has low to medium rainfall and hours of sunshine compared to the rest of the UK, however, there is a greater than average number of days when snow is laying (up to 105 in upland areas and more than 9 in coastal areas).

The population of the Moray Council area is approximately 89,000 with the majority residing in the towns of Elgin, Forres, Fochabers, Keith, Buckie, and Lossiemouth. The industrial and commercial areas are primarily located in the north of the Council area in Elgin, Keith, Fochabers and Lossiemouth. The other notable operations in the area are the two RAF bases in Lossiemouth and Kinloss and the distilleries operating in Rothes, Dufftown, Keith and the surrounding upland areas.

The transport network within Moray comprises a mainline passenger rail route passing east-west through the north of the Council area, the A96 trunk road linking Aberdeen, Elgin and Inverness and several other roads providing links to coastal towns and upland areas. There are also several small harbours and ports used by small fishing boats and leisure craft.

1.5 Previous air quality assessments

Moray Council completed an Updating and Screening Assessment (U&SA) in April 2003⁶. The U&SA concluded that it was unlikely that any NAQS objectives would be exceeded for CO, benzene, 1,3-butadiene, lead, NO₂ and SO₂ within the Moray Council area. It was identified that further assessment of PM₁₀ concentrations from road traffic emissions was required at three junctions within Elgin and that further information relating to domestic fuel use and quarries was required.

⁶ Moray Council LAQM Updating and Screening Assessment 2003, BMT Cordah Ltd Report Ref: MOR_005, May 2003

The Supplementary Report to the Updating and Screening Assessment⁷, submitted in January 2004, assessed additional data from the 2001 Census, Moray Council Housing Department, gas suppliers and local coal merchants with regards to emissions from domestic fuel use. The report concluded that it was unlikely that NAQS objectives for SO₂ and PM₁₀ would be exceeded due to domestic coal burning. The supplementary report also considered emissions from quarries and other dusty processes, seven receptors were identified within 200m of dust emitting processes, however, no complaints or concerns relating to dust from the quarries had been raised and therefore it was concluded that the operating processes were unlikely to result in exceedences of the NAQS objectives for PM₁₀. The supplementary report also re-considered the locations of predicted exceedences due to road traffic emissions. SpeyBay junction on the A96(T) identified in the U&SA as likely to exceed NAQS objectives was shown to have no relevant public exposure therefore it was concluded that the Detailed Assessment of particulates was required for the two adjacent junctions of the A96(T) at Queen Street roundabout and North College Street junction in Elgin.

An assessment of NO₂, dust and VOC concentrations in the vicinity of RAF Lossiemouth and RAF Kinloss was conducted between November 2003 and June 2004⁸. The report was commissioned in response to public complaints of odour and dust nuisance. The assessment concluded that there had been no exceedences of NAQS objectives, odour nuisance criteria or environmental assessment levels for any of the pollutants detected.

The Moray Council LAQM Progress Report for 2005⁹ reviewed the changes in industrial and domestic sources of pollutants and assessed the updated monitoring data for NO₂ and PM₁₀. The report concluded that there is no potential for the exceedence of the NAQS objectives for CO, benzene, 1,3-butadiene, lead, NO₂ and SO₂. Monitoring of PM₁₀ being undertaken as part of a Detailed Assessment was incomplete and therefore no conclusions were made regarding the potential for exceedence of PM₁₀ objectives.

The Detailed Assessment of PM₁₀ emissions from road traffic at Queen Street roundabout was completed in August 2005¹⁰. The assessment included a 3-month period of monitoring using a Partisol analyser located at Queen Street roundabout and an atmospheric dispersion modelling assessment. The assessment concluded that it was unlikely that an exceedence of the NAQS objectives for PM₁₀ would result from the existing or projected traffic emissions at locations of relevant public exposure.

The U&SA for Moray Council was completed in April 2006¹¹ which concluded that it was unlikely that any NAQS objectives would be exceeded within the Moray Council area.

⁷ Supplementary Report to the Updating and Screening Assessment, BMT Cordah Ltd Report Ref: MOR_008, January 2004

⁸ Air Quality Study in the Vicinity of RAF Lossiemouth and RAF Kinloss, BMT Cordah Ltd Report Ref: MOR_007, November 2004

⁹ Moray Council LAQM Progress Report 2005, BMT Cordah Ltd Report Ref: E_MOR_010, May 2005

¹⁰ Detailed Assessment of Road Traffic Particulate Emissions, BMT Cordah Ltd Report Ref: MOR_009, August 2005

¹¹ Moray Council LAQM Updating and Screening Assessment 2006, BMT Cordah Report Ref: E_MOR_011, April 2006

2 MONITORING

Moray Council undertake regular monitoring of NO₂ at several locations across the Council area representing sites of exposure to road traffic emissions, industrial emissions and background locations. Moray Council have also previously undertaken monitoring of particulates in Elgin town centre and dust and VOCs at locations close to the military bases RAF Lossiemouth and RAF Kinloss.

2.1 Nitrogen dioxide

Moray Council monitor NO₂ using a network of 13 passive diffusion tubes located within the five major towns in the council area.

The NO₂ diffusion tubes used by Moray Council are prepared and analysed by Aberdeen City Council public analyst who are UKAS accredited for this technique. The diffusion tubes used by Moray Council are prepared by Gradko using the 20% triethanolamine in water method.

Moray Council do not undertake a local co-location study therefore the results from the NO₂ diffusion tubes have been corrected using a bias factor provided by the laboratory. Co-location studies carried out in nearby local authorities are used by the laboratory to determine an annual bias correction factor. The bias correction factor for 2006 was calculated to be 0.96.

The monitoring results in Table 2 indicate that with the exception of the site at Fochabers 2, there was a data capture rate suitable for use in screening assessments (>70%). The results indicate that there have been no exceedences of the annual mean NAQS objective concentration for NO₂ recorded in the Moray Council area.

There is a significant positive correlation (> 0.7) between recorded NO₂ concentrations since 2003 at Elgin 1, Elgin 6 and Fochabers 1. The NO₂ concentrations at other sites in Elgin also show a positive correlation although it is not significant and therefore the trend is less certain. There were no significant trends recorded in the NO₂ concentrations at Keith, Fochabers 2, Lossiemouth and Forres since 2003. There is an increasing trend in NO₂ concentrations at the Kerbside locations in Elgin and Fochabers.

2.2 Particulates

Moray Council have previously undertaken monitoring of particulates adjacent to Queen Street roundabout in Elgin as part of a Detailed Assessment. The monitoring indicated that the measured annual mean concentration in 2005 and predicted annual mean concentrations for 2010 were below the relevant NAQS objectives. The gravimetric analyser was decommissioned in June 2005. The Council is considering re-installing the analyser at the Council Headquarters in Elgin to provide a longer term measurement of urban background PM₁₀ concentrations.

Table 2: Annual mean NO₂ concentrations recorded in Moray Council area

Site no.	Site Location	Site Classification	2003 corrected for bias (0.79)	2004 corrected for bias (0.80)	2005 corrected for bias (0.82)	2006 corrected for bias (0.96)	2006 Data capture rate (%)
Elgin 1	West Park Court, Elgin	Kerbside	28.9	27.1	28.7	33.1	100%
Elgin 2	Junction of East & Maisondieu Road, Elgin	Kerbside	22.6	20.8	20.4	27.5	92%
Elgin 3	99 – 101 Maisondieu Road, Elgin	Roadside	12.5	10.5	11.0	14.4	92%
Elgin 4	26-28 Priory Place, Elgin	Urban background	9.7	8.1	10.4	10.0	100%
Elgin 5	Main Street, New Elgin	Kerbside	16.5	14.1	15.2	18.0	100%
Elgin 6	Queen St Roundabout, Elgin	Kerbside	23.3	16.5	16.7	19.8	100%
Fochabers 1	50A High Street, Fochabers	Roadside	24.8	27.2	27.4	29.1	100%
Fochabers 2	Sunndach, George Street, Fochabers	Urban background	5.0	4.7	4.8	9.2	58%
Forres	Tolbooth, High Street, Forres	Roadside	15.3	14.1	13.5	16.5	100%
Keith 1	106 Moss Street, Keith	Roadside	22.7	21.9	18.7	25.4	100%
Keith 2	87 Moss Street, Keith	Kerbside	23.6	20.2	21.8	24.5	100%
Lossie 1	1 Merryton Court, Lossiemouth	Kerbside	6.5	5.0	5.3	6.2	83%
Lossie 2	27 James Street, Lossiemouth	Kerbside	7.2	5.7	5.7	6.6	83%

3 EMISSION SOURCES

The main emission sources located within Moray Council have been checked to identify any likely changes that have occurred or are predicted to occur since the 2006 LAQM U&SA report.

3.1 Industrial emissions

There have been no new industrial processes which have commenced operation since the submission of the U&SA in 2006.

There are two PPC Part A processes in the Moray Council area that were issued permits in 2006. These processes were operating prior to 2006 but were not required to be permitted. The two sites operate intensive farming – poultry processes. The two processes are outlined in Table 3.

Table 3: New SEPA regulated processes

Operator	Process	Site location	Authorisation	Pollutants
James Taylor and Son	Intensive Farming - Poultry	Wellhill Farm, Wellhill, Dyke, Forres	PPC/A/1017011	Odour, Dust, PM ₁₀
Kinloss Country Chickens Limited	Intensive Farming - Poultry	Upper Hempriggs Farm, Kinloss, Forres	PPC/A/1016765	Odour, Dust, PM ₁₀

Since the 2006 U&SA, eight processes (six service stations, one road-stone coating process and one timber process) have been altered from Local Authority Pollution Control (LAPC) regulation to Pollution Prevention and Control (PPC) Part B authorisation. There has been no change to the operations or emissions from these sites; the new permits are due to the re-organisation of the regulatory framework. The updated technical guidance states that unless there have been specific dust related issues related to an intensive poultry farming process it is unlikely that there will be an exceedence due to the process.

The Scottish Environment Protection Agency was not aware of any other new processes or processes that had ceased to operate since the submission of the U&SA in 2006.

3.2 Quarries and other dusty processes

Since the 2006 U&SA, no new quarries have commenced operation and there have been no significant changes to emissions from existing quarries.

In 2006, a waste transfer station commenced operation; the site is located at Moycroft Road, Chanonry Industrial Estate, Elgin. Using the screening assessment method available in the LAQM Technical Guidance the potential particulate emissions from the site have been compared to the NAQS objective levels. The background PM₁₀ concentration for 2010 is predicted to be 11.4µg/m³ therefore based on the guidance there is a potential for exceedence of the annual mean objective only where there are residential properties within 200m of the process. The nearest residential

receptors are located approximately 300m from the site on Pine Grove to the south-east and Pinefield Road to the west. It is therefore considered unlikely that the process will result in an exceedence of NAQS objectives for PM₁₀.

3.3 Road traffic emissions

The 2006 road traffic flows for the Moray Council area were analysed to determine any new roads with predicted traffic flows greater than 10,000 vehicles as an annual average daily total (AADT) or any existing roads with an AADT greater than 10,000 AADT where the traffic flow has increased by 5% or more. Road traffic data for the trunk roads was provided by the Transport Scotland and road traffic flows for local roads and Elgin town centre were provided by Moray Council. Moray Council also provided traffic predictions based on the VISSIM traffic model for smaller routes not counted directly.

The A96(T) and A941 were identified as having traffic flows greater than 10,000 AADT. The road traffic emissions along the A96(T) at Mosstodloch, Forres, and Elgin has been assessed previously and it was concluded that emissions were unlikely to result in the potential to exceed the NAQS objectives for NO₂ and PM₁₀. The AADT measured in 2006 on the A96(T) is greater than 10,000 vehicles and is more than 5% greater than the traffic flows assessed previously. Road traffic flows on the A941 have not previously been assessed. Road traffic flows on other routes in the Moray Council area are below 10,000 AADT or have increased by less than 5% since the 2006 U&SA.

A DMRB screening assessment has therefore been carried out for the A96(T) on East Road, South College Street, Alexander Road, High Street and West Road and for the A941 on Station Road, and Lossiemouth Road in Elgin and on Main Street in New Elgin. The assessments are presented in Appendix 1.

The predicted pollutant concentrations for road traffic emissions on the A941 and A96(T) were below the relevant NAQS objectives for CO, benzene, 1,3-butadiene, NO₂ and PM₁₀.

Monitoring undertaken at Queen Street roundabout on the A96(T) also indicated that current annual mean concentrations of NO₂ and PM₁₀ are below the NAQS objectives.

3.4 Planned developments and changes to commercial and domestic emissions

There were sixteen new developments that were identified as having the potential to increase road traffic and thus local pollutant concentrations within Elgin. The developments are either already built, under construction or have been granted planning permission.

There are 446 residential properties, a neighbourhood centre and 1400ft² of retail space is being developed in the south and south-east of Elgin on Wards Road, Linkwood Road, Thornhill Road and Reiket Lane.

A garden centre to the west of Elgin on Morriston Road, a woollen mill on Newmill Road in the north-east of Elgin and three small food-retail sites are being developed in the centre of Elgin.

In addition one large retail site and four smaller commercial, retail and factory sites are being developed on Edgar Road in the south-west of Elgin, which is likely to increase the amount of HGV traffic in the area.

All developments are likely to increase the road traffic flows on the road network around Elgin, in particular on the A96(T) and A941 through the centre of Elgin. The predicted rise in road traffic flows has the potential to increase the local concentrations of NO₂ and PM₁₀.

The assessment of current road traffic flows on the A96(T) and A941 in Elgin indicate that the predicted concentrations of NO₂ at all assessed roads are less than 50% of the annual mean NAQS objective. The measured NO₂ concentrations at East Road and West Park Court (adjacent to High Street) are approximately 75% of the annual mean NAQS objective. The PM₁₀ concentration measured at Queen Street roundabout in 2005 is comparable to the 2006 concentration predicted in the DMRB assessments at South College Street and East Road, which would suggest a high confidence in the DMRB results for PM₁₀. The predicted PM₁₀ concentrations for 2010 in Elgin are less than 80% of the annual mean NAQS objective. It is unlikely that increased traffic emissions associated with the planned developments will result in an exceedence of the NAQS objectives for NO₂ or PM₁₀.

Continued monitoring of NO₂ at Queen Street roundabout, East Road, West Park Court and Main Street will determine if the planned developments result in any significant changes to the local air quality.

4 LOCAL STRATEGIES AND POLICIES

There have been no new or significant changes to local policies and strategies relating to local air quality that have been implemented by Moray Council.

5 CONCLUSIONS

Moray Council carried out monitoring of NO₂ at several locations throughout the Council area in 2006. The measured NO₂ concentrations were below the annual mean NAQS objective. It is intended that NO₂ monitoring will continue at all existing sites during 2007.

There was no monitoring of PM₁₀ concentration undertaken by Moray Council during 2006. If resources allow, the partisol monitor will be installed at the Council Offices in Elgin in order to monitor urban background concentrations.

There have been no significant changes to existing industrial emissions within the Moray Council area. A new waste transfer site has commenced operation in Elgin and two intensive farming processes have now been licensed under the new PPC regulations. Emissions from the sites were considered and it was concluded that they were unlikely to result in an exceedence of the NAQS objectives.

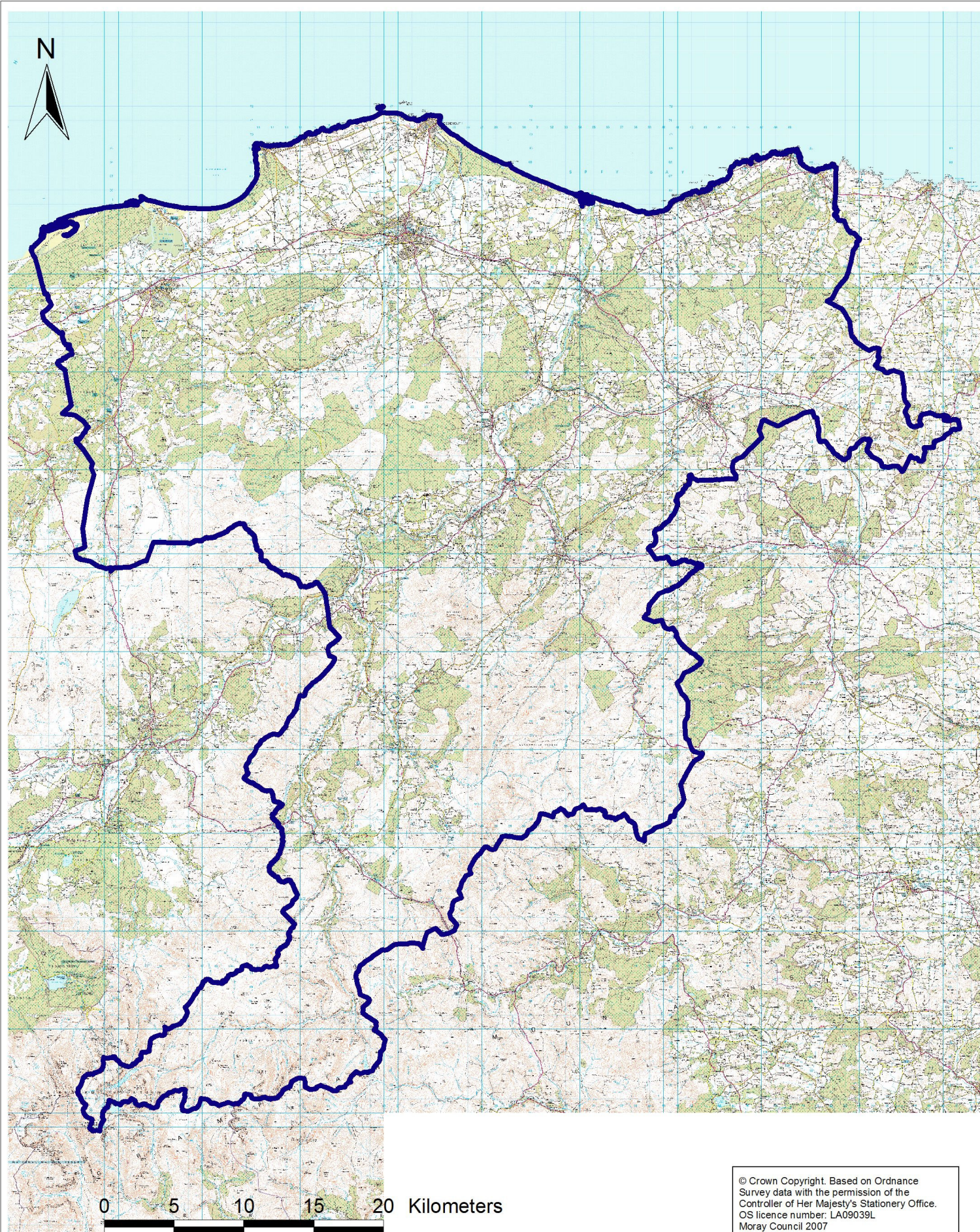
There have been a significant number of residential and commercial developments located in and around Elgin for which planning permission has been granted. These developments are likely to result in increased road traffic in Elgin and therefore increase concentrations of NO₂ and PM₁₀ at roadside locations along the A96 and A941. Current monitoring and updated DRMB screening analyses indicate that concentrations along these roads are unlikely to exceed NAQS objectives. The current concentrations of NO₂ and concentrations of PM₁₀ measured in 2005 indicate that there is sufficient margin between current levels and the objectives to account for the increased contributions from road traffic emissions due to planned developments. It is therefore not expected that the planned developments will result in an exceedence of the NAQS objectives. The monitoring locations on East Road, Main Street and West Park Court will provide evidence of any changes to local air quality due to increased traffic.

It is concluded that there is no potential for exceedence of the NAQS objectives.

FIGURES

Figure 1: Moray Council area

Figure 2: Location of NO₂ monitoring sites



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Figure Title

Moray Council area

Legend

Figure Number

1



Moray Council boundary

Project Title

LAQM Progress Report 2007

Date

May 2007

Scale

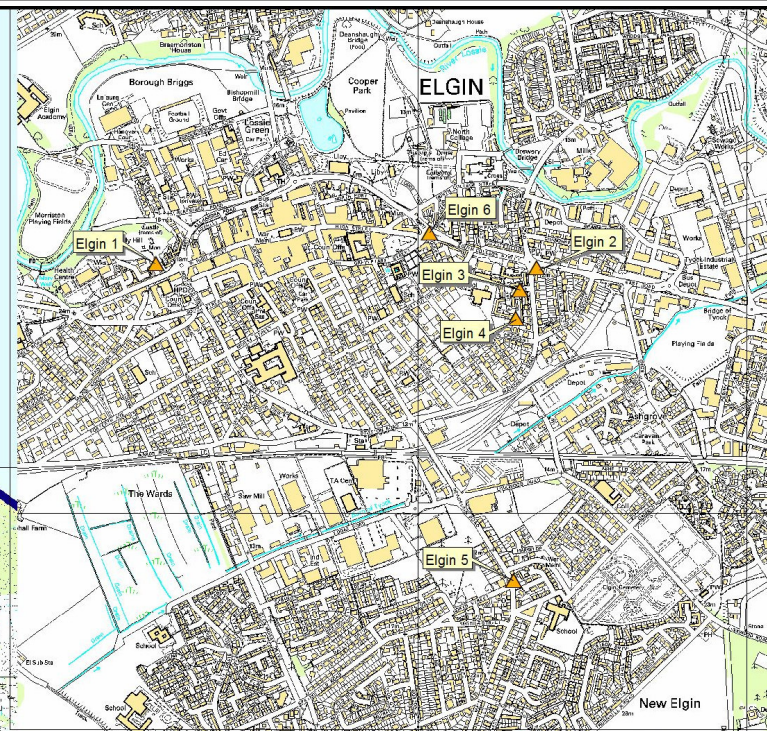
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The Moray Council

Legend

-  Moray Council boundary
-  NO2 monitoring locations

Date	May 2007
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Project title:
LAQM Progres Report 2007

Figure no. 2

Figure title
Location of NO2 monitoring sites

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APPENDIX 1: DMRB ASSESSMENTS

INPUT SHEET

Step 6

Step 7

Step 7

Step 7

Step 7

INPUT SHEET

Step 6

Step 7

Step 7

Step 7

Step 7

