2014 Air Quality Progress Report for East Lothian Council

In fulfillment of Part IV of the
Environment Act 1995
Local Air Quality Management

August 2014

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Executive Summary

This report presents the results of the Progress Report of local air quality within the East Lothian Council area. The Progress Report represents the final step in the current round of the management of local air quality, as required by Part IV of the Environment Act, 1995.

Progress Reports are required in the intervening years between the three-yearly Updating and Screening Assessment reports. Their purpose is to maintain continuity in the Local Air Quality Management process.

The results of new monitoring data indicate that the Objectives for all pollutants, with the exception of NO2, are being met.

Following on from the 2013 Progress Report passive monitoring of Nitrogen dioxide (NO_2) in Musselburgh indicated concentrations at various locations that continued to exceed, or were very close to, the Annual Mean Objective. Accordingly, in November 2013 an Air Quality Management Area (AQMA) was declared in Musselburgh in relation to breaches and likely breaches of the Nitrogen Dioxide annual mean air quality objective. The extent of the AQMA is High Street, Musselburgh (A199) from its junction with Newbigging and extending westwards to the junction with Bridge Street and Mall Avenue.

East Lothian Council has carried out a Further Assessment to assess the present and future air quality within the existing AQMA and the reasons for this. The assessment provides the technical justification for the measures the authority later includes in any action plan. The Further Assessment was completed in September 2014.

The study has confirmed the findings of the previous Detailed Assessment, namely that there are exceedences of the annual mean NO_2 objective where relevant exposure exists. The contour plots and dispersion modelling prepared for this study, and monitoring results for 2013, indicate that the current AQMA boundary includes all relevant sources and does not require revocation or amendment at this time.

It was estimated that ambient NOx reductions in the AQMA of up to 27% at some locations are required in order to achieve compliance with the annual mean NO2 objective.

The source apportionment exercise of NOx indicates that emissions from buses form the largest contribution to roadside NOx concentrations at all locations along the High St AQMA.

Modelling of the mitigation scenarios agreed with the Council indicates that an integrated package of interventions would provide the best NOx reductions. Measures that reduce overall traffic, reduce queuing and reduce bus numbers, where appropriate, will reduce road NOx significantly. These measures are however very challenging (both financially and technically) to implement.

The 2014 Progress Report confirms that NO_2 emissions continue to exceed, or are very close to, the Annual Mean Air Quality Objective at some locations within the AQMA.

The results of monitoring of PM_{10} indicate that current Objectives are being complied with and there is no need to proceed to a detailed assessment.

The next course of action for East Lothian Council in the Review and Assessment process is the submission of an Updating & Screening Assessment by April 2015.

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1 Introduction

1.1 Description of Local Authority Area

East Lothian is approximately 270 square miles in area and has 43 miles of coastline (photograph 1). Our boundaries extend from Musselburgh, immediately east of Edinburgh's suburban edge, eastwards to Dunbar and beyond to the Scottish Borders. From the coastline of the Firth of Forth, an agricultural plain extends southwards to the Lammermuir hills.

Photograph 1 – Yellowcraigs Beach

The population of East Lothian is circa 94,000. More than half the population live in its western sector, the main towns being Musselburgh (approximate population 22,000), Prestonpans (7,000), Tranent (9,000) and Cockenzie/Port Seton (5,500). The principal towns in the east are Haddington (9,000), North Berwick (6,000) and Dunbar (7,000). Although Musselburgh is the largest town, Haddington is the administrative centre for East Lothian Council.

The major sources of pollutants within the County are road traffic (photograph 2) although potential industrial sources are the former coal-fired Cockenzie Power Station, Cockenzie (photograph 3) which has been granted Planning Consent for a Combined Cycle Gas Turbine (CCGT) Power Station and also Lafarge Cement Works, Dunbar (photograph 4).

Photograph 2 – Buses on Musselburgh High Street

Photograph 3 – Cockenzie Power Station:

Photograph 4 – Lafarge Cement Works, Dunbar:

1.2 Purpose of Progress Report

This report fulfils the requirements of the Local Air Quality Management (LAQM) process as set out in Part IV of the Environment Act (1995) (Ref 1), the Air Quality Strategy for England, Scotland, Wales and Northern Ireland 2007 (Ref 2) and the relevant Policy and Technical Guidance documents (Ref 3). The LAQM process places an obligation on all local authorities to regularly review and assess air quality in their areas, and to determine whether or not the air quality objectives are likely to be achieved. Where exceedences are considered likely, the local authority must then declare an Air Quality Management Area (AQMA) and prepare an Air Quality Action Plan (AQAP) setting out the measures it intends to put in place in pursuit of the objectives.

Progress Reports are required in the intervening years between the three-yearly Updating and Screening Assessment reports. Their purpose is to maintain continuity in the LAQM process.

They are not intended to be as detailed as Updating and Screening Assessment Reports, or to require as much effort. However, if the Progress Report identifies the risk of exceedence of an Air Quality Objective, the Local Authority (LA) should undertake a Detailed Assessment immediately, and not wait until the next round of Review and Assessment.

1.3 Air Quality Objectives

The air quality objectives applicable to LAQM **in Scotland** are set out in the Air Quality (Scotland) Regulations 2000 (Scottish SI 2000 No 97) (Ref 4), the Air Quality (Scotland) (Amendment) Regulations 2002 (Scottish SI 2002 No 297) (Ref 5), and are shown in Table 1.1. This table shows the objectives in units of micrograms per cubic metre µg/m^3 (milligrammes per cubic metre, mg/m^3 for carbon monoxide) with the number of exceedences in each year that are permitted (where applicable).

Table 1.1 Air Quality Objectives included in Regulations for the purpose of LAQM in Scotland

Pollutant	Air Quality Objective		Date to be achieved by
	Concentration	Measured as	
Benzene	16.25 µg/m^3	Running annual mean	31.12.2003
	3.25 µg/m^3	Running annual mean	31.12.2011
1,3-Butadiene	2.25 µg/m^3	Running annual mean	31.12.2003
Carbon monoxide	10 mg/m^3	Running 8-hour mean	31.12.2003
Lead	0.50 µg/m^3	Annual mean	31.12.2004
	0.25 µg/m^3	Annual mean	31.12.2008
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
Particulate Matter (PM_{10}) (gravimetric)	50 µg/m^3, not to be exceeded more than 7 times a year	24-hour mean	31.12.2011
	18 µg/m^3	Annual mean	31.12.2011
Sulphur dioxide	350 µg/m^3, not to be exceeded more than 24 times a year	1-hour mean	31.12.2004
	125 µg/m^3, not to be exceeded more than 3 times a year	24-hour mean	31.12.2004
	266 µg/m^3, not to be exceeded more than 35 times a year	15-minute mean	31.12.2005

1.4 Summary of Previous Review and Assessments

During the second round of review and assessment (Refs 6, 7 and 8), which was due to be completed by April 2005, Carbon Monoxide, Benzene, Lead and 1,3-Butadiene were identified as not being likely to exceed the relevant Air Quality Objectives. The third round of review and assessment (Refs 9, 10 and 11), which was due to be completed by April 2008, indicated that the relevant Air Quality Objectives for these pollutants continued to be met.

However, the second round of review and assessment (Refs 6, 7 and 8) did conclude that Nitrogen Dioxide and PM10 levels in Musselburgh, due to road traffic sources, and also Sulphur Dioxide levels in vicinity of Cockenzie Power Station, Cockenzie and Lafarge Cement Works, Dunbar would require to be subject of a Detailed Assessment. PM10 levels in vicinity of Cockenzie Power Station would also require Detailed Assessment.

The Detailed Assessment (Ref 7) and subsequent third round of review and assessment (Refs 9, 10 and 11) indicated that the relevant Air Quality Objectives for Nitrogen Dioxide levels in Musselburgh and throughout East Lothian continued to be met.

However, PM10 levels due to road traffic were forecast to exceed the annual mean objective for 2010 in Musselburgh, although these results were based on the application of correction factors and were obtained using Osiris light-scattering measurement equipment that has since been deemed as unsuitable for comparison against Objectives. The Osiris units were replaced with Tapered Element Oscillating Microbalance (TEOM) units in May 2005. The 2007 Progress Report (Ref 10) concluded, from results obtained using the TEOM unit, that the 24-hour mean Objective will be complied with. Furthermore, the Annual Mean Objective was being complied with using the local correction factor of 1.14. However, the Annual Mean was exceeded when the National correction factor of 1.3 was applied. Correspondence from the Scottish Executive (Ref 12) advised that where the predicted levels are below the Objective using the local correction factor but above the Objective when the National correction factor is applied, the local authority should carryout monitoring using a gravimetric sampler. East Lothian Council, however, did not feel that this approach could be justified at that time, especially having regard to the results of the Department for Environment Food and Rural Affairs (DEFRA) equivalence study (Ref 13) which concluded that TEOM units not fitted with Filter Dynamics Measurement Systems (FDMS) failed to meet equivalence criteria and, as such, cannot be considered equivalent to the European Reference method. As a consequence, in March 2008 East Lothian Council replaced the TEOM unit with a Beta Attenuation Monitor (BAM) unit, the results of which can be compared directly to the Objective levels as the BAM units met the equivalence criteria outlined by DEFRA.

The Detailed Assessment (Ref 7), and subsequent Updating and Screening Assessment (Ref 9) of PM10 levels in Cockenzie due to activities undertaken within the coal storage plant for Cockenzie Power Station concluded that the relevant Air Quality Objectives would be met by the target year.

The Detailed Assessment (Ref 7) of Sulphur Dioxide levels in vicinity of Cockenzie Power Station, Cockenzie concluded that there would be no exceedences of any Objectives, although the 15-minute mean in the vicinity of Lafarge Cement Work's, Dunbar was forecast to exceed the Objective. However the installation of abatement equipment and the subsequent reduction in Sulphur Dioxide emissions has been taken into account in the third round of Review and Assessment (Refs 9, 10 and 11) that concluded the relevant Air Quality Objectives would be met.

The previous Round of Review and Assessment (Round 4) was completed in May 2012. As with previous rounds of review and assessment, this round was also based on a phased approach. The first step of this round was the Updating and Screening Assessment (USA) (Ref 14), which was due to be completed by April 2009 and was subsequently completed in November 2009.

If sufficient risk is identified, then the local authority must complete a Detailed Assessment to provide an accurate estimate of the likelihood of an air quality objective being exceeded at the particular location with relevant public exposure. The results of the USA in 2009 (Ref 14) concluded that a Detailed Assessment of PM10 and Nitrogen Dioxide levels in Musselburgh was required due to the Biomass Combustion Plant located at the Queen Margaret University. This Detailed Assessment (Ref 15) was completed in October 2010 and concluded that the biomass emissions will not result in any

exceedence of the relevant Air Quality Objectives and that the process contributions are typically a small percentage of the overall Air Quality Objectives.

The Progress Report completed in 2010 (Ref 16) concluded that all Air Quality Objectives continued to be met within East Lothian.

Following completion of the Progress Report in 2011 (Ref 17) the results of automatic and passive monitoring of Nitrogen dioxide confirmed that both the annual and 1-hour objectives continued to be met. However, passive monitoring of Nitrogen dioxide in Musselburgh High Street indicated exceedences at 2 locations (tube numbers 6 and 7 in vicinity of 147 and 183 High Street respectively). Accordingly, a Detailed Assessment of NO2 at these locations was required.

The Detailed Assessment of Nitrogen dioxide in Musselburgh due to Road Traffic Sources (Ref 18) was completed in June 2012. It was concluded from the Detailed Assessment that the highest modelled annual average NO2 concentrations were predicted at receptors located on High Street and Bridge Street close to bus stops and that the majority of the predicted annual mean exceedences were marginal. An element of uncertainty was introduced to the computer model used in the Detailed Assessment as a result of estimating emissions from both queuing traffic and stationary buses. It was considered appropriate by East Lothian Council to carry out passive monitoring of NO2 at a representative sample of these exceeding receptor locations to confirm the results of the modelling assessment. This would greatly enhance the reliability of any Further Assessment and allow better delineation of any required AQMA boundary. As a result of the abovementioned conclusion East Lothian Council started monitoring NO2 concentrations at 5 new locations on 3rd May 2012; using passive diffusion tubes. These new monitoring sites are located at receptors R1 (167 High Street), R5 (137 High Street), R13 (69 High Street), R24 (86 High Street) and R47 (15 Bridge Street) where dispersion modelling indicates that exceedences of the NO2 annual mean objective had occurred during 2011. It was also recommended following the detailed assessment of NO2 that East Lothian Council should consider the declaration of an AQMA for the NO2 annual mean objective after May 2013 if monitoring results obtained from new locations at R1 (167 High Street), R5 (137 High Street), R13 (69 High Street), R24 (86 High Street) and R47 (15 Bridge Street), in addition to existing monitoring locations, confirms the modelling results that the NO2 annual mean objective has been exceeded.

The results of the Updating and Screening Assessment in 2012 (Ref 19) carried out for all pollutants indicates that current Air Quality Objectives are being complied with for the majority of pollutants. However, passive monitoring of Nitrogen dioxide in Musselburgh and the results of a Detailed Assessment of NO2 due to Road Traffic Sources in Musselburgh that was completed in June 2012 (Ref 18) continue to indicate concentrations at various locations that are close to the Annual Mean Objective.

It was considered appropriate by East Lothian Council to carry out passive monitoring of NO2 at a representative sample of these exceeding receptor locations to confirm the results of the modelling assessment. East Lothian Council started monitoring NO2 concentrations at 5 new locations on Musselburgh Bridge Street and High Street on 3rd May 2012; using passive diffusion tubes. It was decided at that time that East Lothian Council should consider the declaration of an AQMA for the NO2 annual mean objective after submission of the 2013 Progress Report (Ref 20) if monitoring results obtained from new locations, in addition to existing monitoring locations, confirmed the modelling results that the NO2 annual mean objective had been exceeded. In November 2013, following completion of the 2013 Progress Report, an Air Quality Management Area (AQMA) was declared in Musselburgh in relation to breaches and likely breaches of the Nitrogen Dioxide annual mean air quality objective. The extent of the AQMA is High Street, Musselburgh (A199) from its junction with Newbigging and extending westwards to the junction with Bridge Street and Mall Avenue (Ref 21). Figure 1.1 shows the extent of the AQMA.

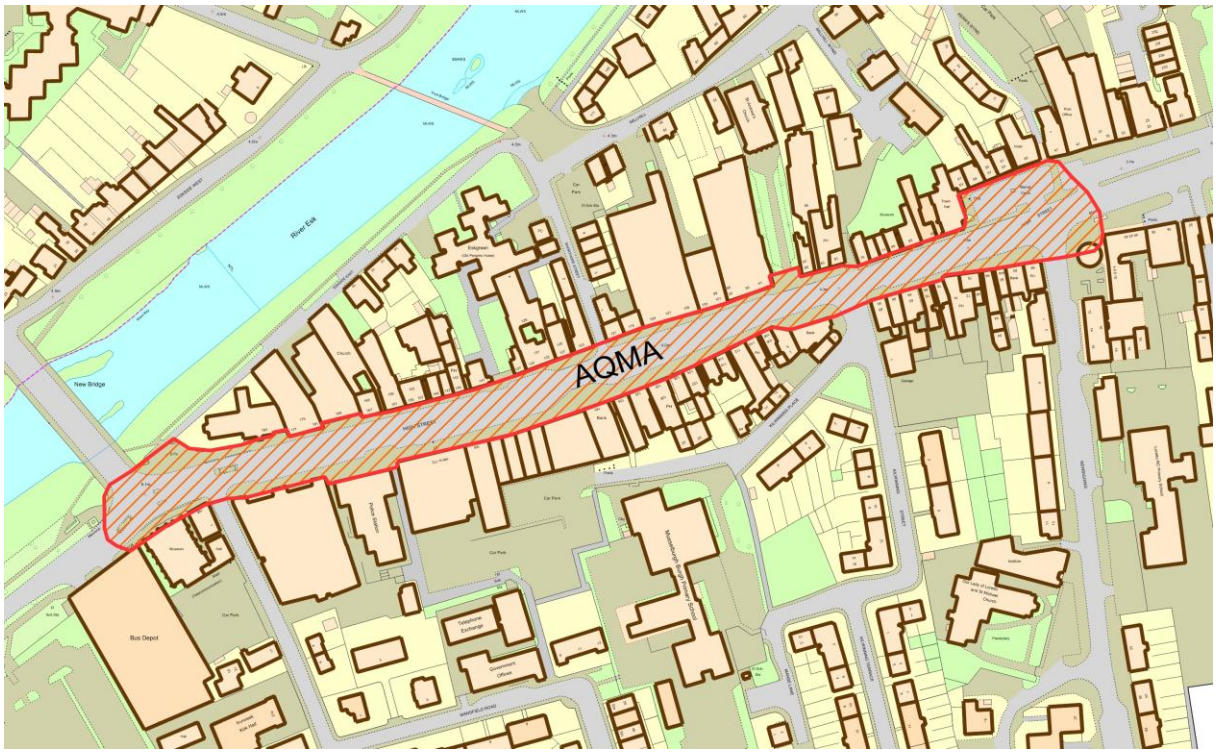
Following declaration of the AQMA East Lothian Council commissioned a Further Assessment of Air Quality in Musselburgh (Ref 22). The assessment provides the technical justification for the measures the authority later includes in any action plan and must be completed within 12 months of declaration of the AQMA. The Further Assessment was completed in September 2014 and confirmed the findings of the previous Detailed Assessment (Ref 18), namely that there are likely to be continued exceedences of the annual mean NO_2 objective where relevant exposure exists.

The Further Assessment estimated that ambient NOx reductions in the AQMA of up to 27% at some locations are required in order to achieve compliance with the annual mean NO2 objective and, furthermore, that a source apportionment exercise indicates that emissions from buses form the largest contribution at all locations along the High Street AQMA. Modelling of the mitigation scenarios agreed with the Council indicates that an integrated package of interventions would provide the best NOx reductions. Measures that reduce overall traffic, reduce queuing and reduce bus numbers, where appropriate, will reduce road NOx significantly. These measures are however very challenging (both financially and technically) to implement.

The contour plots and dispersion modelling prepared for this study indicate that the current AQMA boundary includes all relevant sources and does not require revocation or amendment at this time

A summary of all previous Review and Assessment Reports is provided in Appendix 1

Figure 1.1 Map of AQMA Boundaries in Musselburgh due to exceedence of Nitrogen dioxide Annual Mean Air Quality Objective



2 New Monitoring Data

2.1 Summary of Monitoring Undertaken

2.1.1 Automatic Monitoring Sites

It was proposed following completion of the USA 2009 (Ref 14) and the subsequent Review of Passive and Automatic Monitoring of Nitrogen Dioxide in 2009 (Ref 23) that the NOx analyser that was previously located in Musselburgh High Street would be replaced with a new analyser to be located at Musselburgh North High Street, beside the existing BAM PM_{10} monitor. This work was completed in February 2010 providing a single air quality automatic monitoring station for Musselburgh that will provide the backbone of LAQM in future years in East Lothian. The current locations are shown in Figure 2.1. below:

Figure 2.1 Map of Automatic Monitoring Sites in Musselburgh

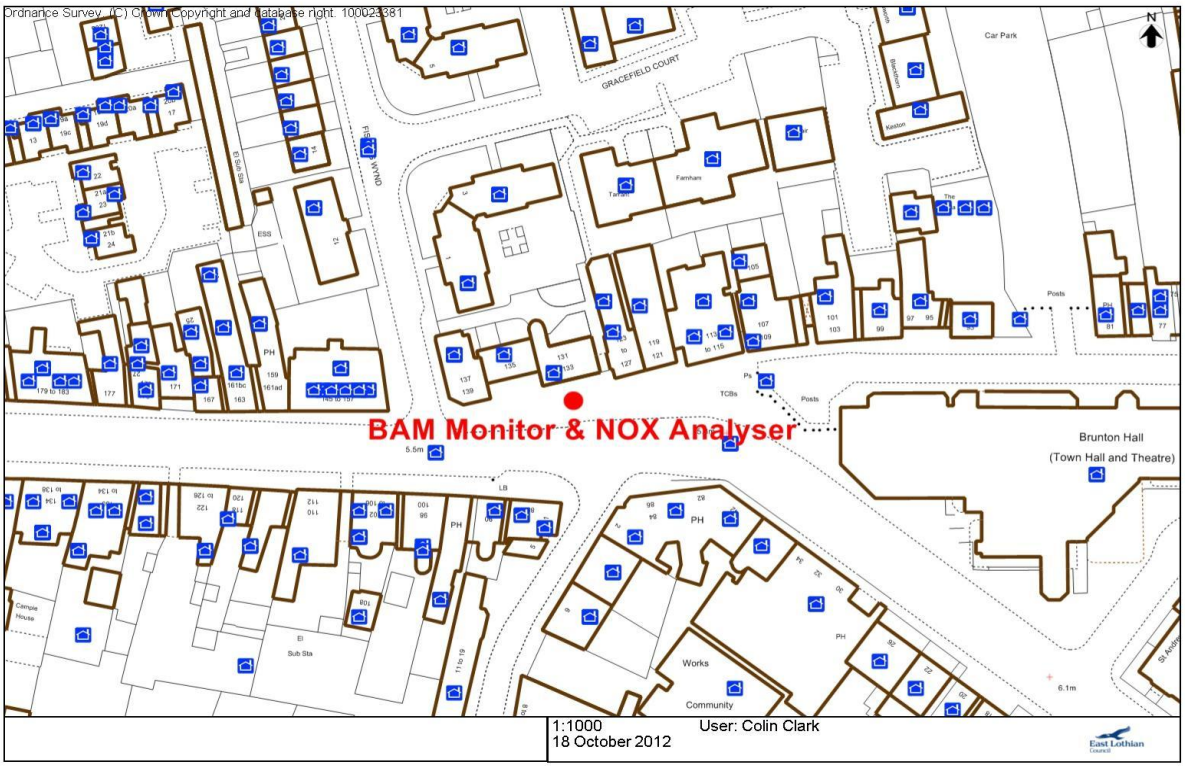


Table 2.1 Details of Automatic Monitoring Sites

Site Name	Site Type	OS Grid Ref		Pollutants Monitored	Monitoring Technique	In AQMA?	Relevant Exposure? (Y/N with distance (m) to relevant exposure)	Distance to kerb of nearest road	Does this location represent worst-case exposure?
		X	Y						
Musselburgh North High Street - BAM	Roadside	333 941	672837	PM_{10}	BAM	N	Y (5m)	3m	Y
Musselburgh North High Street - NOx	Roadside	333 941	672837	NOx	Gas-phase chemilluminescence detection	N	Y (5m)	3m	Y

2.1.2 Non-Automatic Monitoring Sites

Following on from the completion of the USA 2009 (Ref 14) NO_2 Diffusion Tube numbers 1, 4, 6, 7, 8, 9 and 10 would continue to be used to monitor NO_2 in Musselburgh. Three new tubes, numbered 23, 24 and 25 have been co-located with the new NOx Analyser beside the BAM unit at North High Street, Musselburgh. Two additional tubes, numbered 26 and 27 have also been introduced in the vicinity of Salters Road, Wallyford to monitor NO_2 in order to assess any potential impact that may arise as a consequence of the proposed Wallyford Expansion and the likely increase in Road Traffic along Salters Road.

As a result of the abovementioned Detailed Assessment of Nitrogen Dioxide due to road traffic sources in Musselburgh that was completed in June 2012 (Ref 18) East Lothian Council also started monitoring NO2 concentrations at 5 new locations on 3rd May 2012 using passive diffusion tubes. These new monitoring sites are located at Tube 29 (167 High Street), Tube 30 (137 High Street), Tube 31 (69 High Street), Tube 32 (86 High Street) and Tube 28 (15 Bridge Street) where dispersion modelling indicates that exceedences of the NO2 annual mean objective had occurred during 2011

The current locations of all diffusion tubes are shown in Figures 2.2 - 2.5 below:

Figure 2.2 Map of Non-Automatic Monitoring Sites in Musselburgh

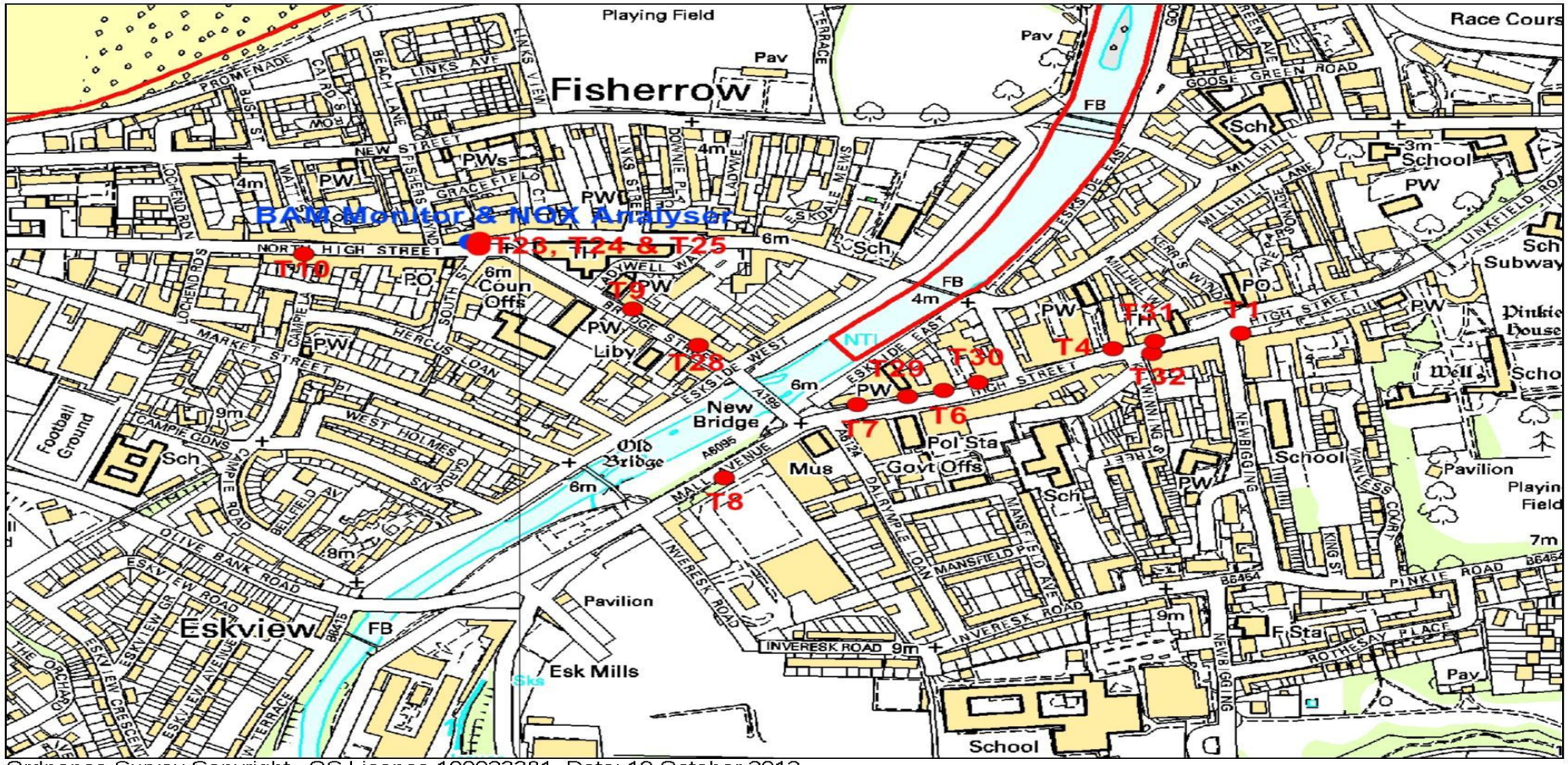


Figure 2.3: Map of Non-Automatic Monitoring Sites in Wallyford

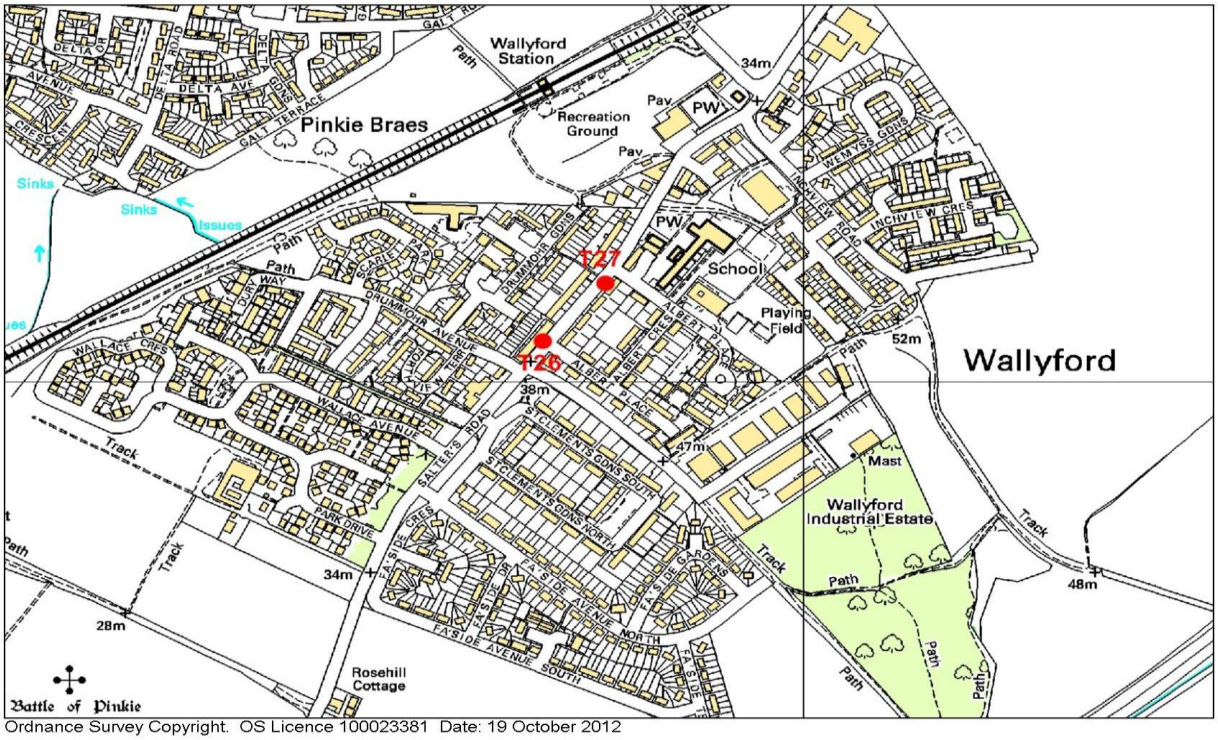


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Figure 2.4: Map of Non-Automatic Monitoring Sites in Tranent

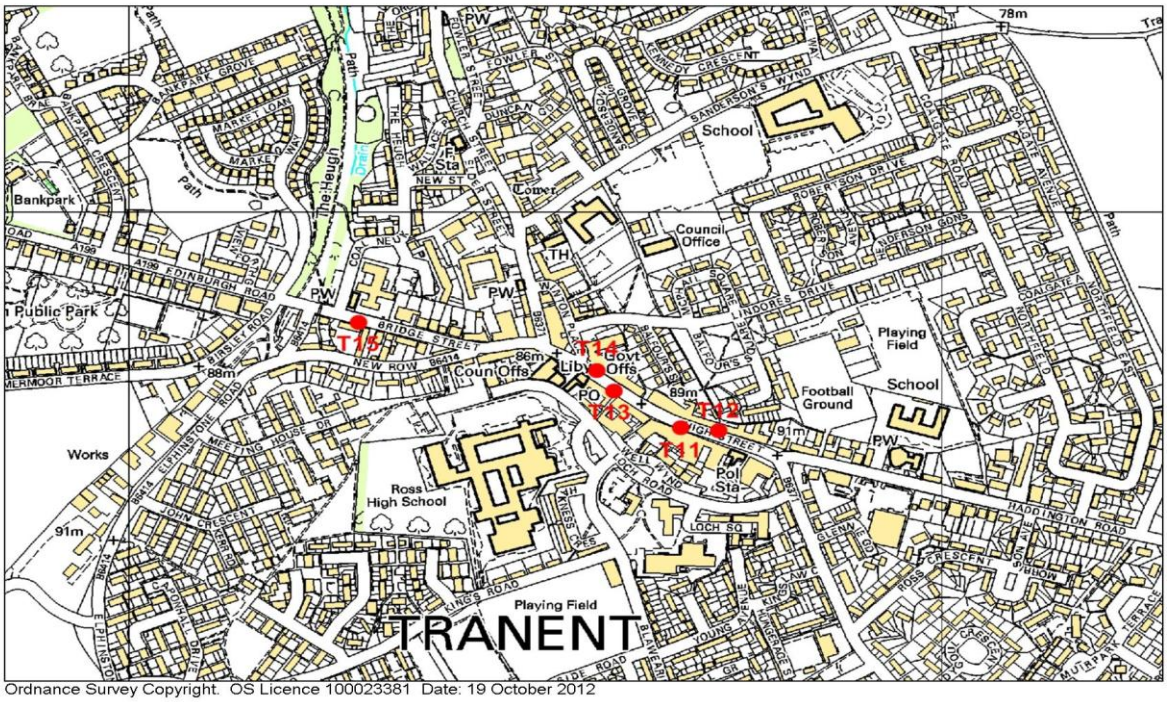

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Figure 2.5: Map of Non-Automatic Monitoring Sites in Haddington

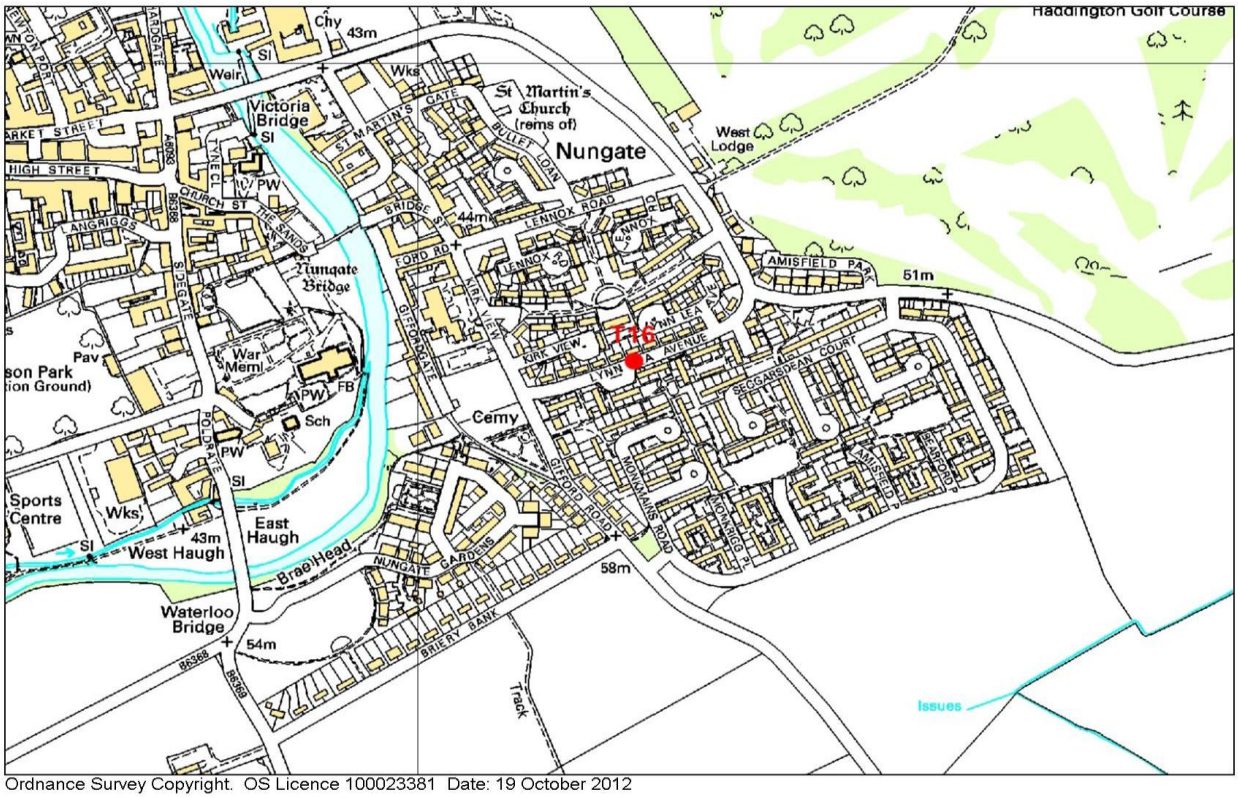

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Table 2.2 Details of Non- Automatic Monitoring Sites for NO_2

Site Name	Site Type	OS Grid Ref		Pollutants Monitored	In AQMA?	Relevant Exposure? *(Y/N with distance (m) to relevant exposure)*	Distance to kerb of nearest road *(N/A if not applicable)*	Worst-case Location?
		X	Y					
1. Musselburgh – Newbigging Junction	Roadside	334659	672720	NO_2	N	Y (15m)	2m	Y
4. Musselburgh - 87 High St	Roadside	334526	672700	NO_2	N	Y (15m)	4m	Y
6. Musselburgh – 147 High Street	Roadside	334392	672652	NO_2	N	Y 20m)	3m	Y
7. Musselburgh – 183 High St	Roadside	334301	672632	NO_2	N	Y 20m)	3m	Y
8. Musselburgh - Mall Av	Roadside	334172	672524	NO_2	N	Y (25m)	4m	Y
9. Musselburgh – 45 Bridge Street	Roadside	334105	672750	NO_2	N	Y (3m)	4m	Y
10 Musselburgh – 150 North High St	Roadside	333800	672822	NO_2	N	Y (3m)	4m	Y
11. Tranent – 89 High St	Roadside	340686	672692	NO_2	N	Y (3m)	3m	Y
12. Tranent – 82 High St	Roadside	370738	672687	NO_2	N	Y (4m)	3m	Y
13. Tranent – 55 High Street	Roadside	340608	672738	NO_2	N	Y (4m)	3m	Y
14. Tranent – 26 High St	Roadside	340570	672780	NO_2	N	Y (2m)	2m	Y
15. Tranent – 58 Bridge St	Roadside	340112	672905	NO_2	N	Y (5m)	2m	Y
16. Haddington - Lyn Lea	Urban	352249	673631	NO_2	N	Y 8m)	3m	Y
23. Musselburgh - Co-located 133 N High St	Roadside	333941	672837	NO_2	N	Y (5m)	3m	Y
24. Musselburgh - Co-located 133 N High St	Roadside	333941	672837	NO_2	N	Y (5m)	3m	Y
25. Musselburgh - Co-located 133 N High St	Roadside	333941	672837	NO_2	N	Y (5m)	3m	Y
26. 116 Salters Rd	Roadside	336691	672055	NO_2	N	Y (5m)	2m	Y
27. 71 Salters Rd	Roadside	336769	672127	NO_2	N	Y (5m)	2m	Y
28. Musselburgh - 15 Bridge Street	Roadside	334164	672708	NO_2	N	Y (5m)	3m	Y
29. Musselburgh - 167 High Street	Roadside	334354	672643	NO_2	N	Y (5m)	3m	Y
30. Musselburgh - 137 High Street	Roadside	334427	672664	NO_2	N	Y (5m)	3m	Y
31. Musselburgh - 69 High Street	Roadside	334580	672713	NO_2	N	Y (5m)	3m	Y
32. Musselburgh - 86 High Street	Roadside	334578	672695	NO_2	N	Y (5m)	3m	Y

2.2 Comparison of Monitoring Results with Air Quality Objectives

2.2.1 Nitrogen Dioxide (NO_2)

East Lothian Council concluded from previous rounds of review and assessment that the annual mean and 1-hour mean air quality objectives would be complied with by the target date of 31 December 2005 and would continue to be met. An air quality management area (AQMA) was not required although monitoring of NO_2 would continue using both the continuous analyser located at Musselburgh High Street and passive diffusion tubes located in Musselburgh and the other towns of Tranent and Haddington. Most recent reviews and assessments have, however, indicated exceedences of Annual Mean objective at various locations on Musselburgh High Street which resulted in declaration of an AQMA IN November 2013. Ratified Nitrogen dioxide data for 2013 is shown in Appendix 2.

Automatic Monitoring Data

Table 2.3 Results of Automatic Monitoring for NO_2: Comparison with Annual Mean Objective

Site ID	Site Type	Within AQMA ?	Valid Data Capture for period of monitoring %	Annual mean concentrations (μg/m^3)					
				2008	2009	2010	2011	2012	2013
Musselburgh North High Street – NOX	Roadside	N	81.3%	25.9	NO DATA*	29	24	24	24

Note:* Following on from East Lothian Council's Progress Report in 2010 (Ref 16) and previous Review of Passive and Automatic Monitoring of Nitrogen Dioxide in East Lothian that was undertaken in 2009 (Ref 23) as described in Section 2.1 above, the monitoring data for nitrogen dioxide for 2009 is incomplete and, as such, there is insufficient data to report.

Table 2.4 Results of Automatic Monitoring for NO_2: Comparison with 1-hour Mean Objective

Site ID	Site Type	Within AQMA?	Valid Data Capture for period of monitoring %	Number of Exceedences of hourly mean (200 μg/m^3) *If the period of valid data is less than 90% of a full year, include the 99.8th % ile of hourly means in brackets.*					
				2008	2009	2010	2011	2012	2013
Musselburgh North High Street - NOX	Roadside	N	81.3	0 (106.3)	NO DATA*	0	0 (94)	0	0 (101)

Note:* Following on from East Lothian Council's Progress Report in 2010 (Ref 16) and previous Review of Passive and Automatic Monitoring of Nitrogen Dioxide in East Lothian that was undertaken in 2009 (Ref 23) as described in Section 2.1 above, the monitoring data for nitrogen dioxide for 2009 is incomplete and, as such, there is insufficient data to report.

Diffusion Tube Monitoring Data

Table 2.5 Results of Nitrogen Dioxide Diffusion Tubes in 2013

Site ID	LOCATION	Site Type	Within AQMA	Triplicate or Co-located	Data Capture 2013 (%)	Data with less than 9 months has been annualised (Y/N)	Confirm if data has been distance corrected (Y/N)	Annual mean concentration (Bias Adjustment factor = 0.8) 2013 (μg/m^3)
1	Musselburgh – Newbigging Junction	Roadside	Y	N	100	N	N	30
4	Musselburgh - 87 High St	Roadside	Y	N	100	N	N	25
6	**Musselburgh – 147 High Street**	**Roadside**	**Y**	**N**	**91.7**	**N**	**N**	**42**
7	Musselburgh – 183 High St	Roadside	Y	N	100	N	N	37
8	Musselburgh - Mall Av	Roadside	N	N	100	N	N	24
9	Musselburgh – 45 Bridge Street	Roadside	N	N	100	N	N	26
10	Musselburgh – 150 North High St	Roadside	N	N	100	N	N	34
11	Tranent – 89 High St	Roadside	N	N	100	N	N	32
12	Tranent – 82 High St	Roadside	N	N	91.7	N	N	28
13	Tranent – 55 High Street	Roadside	N	N	100	N	N	28
14	Tranent – 26 High St	Roadside	N	N	100	N	N	24
15	Tranent – 58 Bridge St	Roadside	N	N	83.3	N	N	19
16	Haddington - Lyn Lea	Urban	N	N	75	N	N	10
23	Musselburgh - 133 N High St	Roadside	N	Triplicate & Co-located	100	N	N	23
24	Musselburgh - 133 N High St	Roadside	N	Triplicate & Co-located	100	N	N	24
25	Musselburgh - 133 N High St	Roadside	N	Triplicate & Co-located	100	N	N	24
26	Wallyford - 116 Salters Rd	Roadside	N	N	91.7	N	N	23
27	Wallyford - 71 Salters Rd	Roadside	N	N	91.7	N	N	24
*28	Musselburgh - 15 Bridge Street	Roadside	N	N	100	N	N	26
*29	Musselburgh - 167 High Street	Roadside	Y	N	100	N	N	38
*30	Musselburgh - 137 High Street	Roadside	Y	N	100	N	N	30
***31**	**Musselburgh - 69 High Street**	**Roadside**	**Y**	**N**	**100**	**N**	**N**	**43**
*32	Musselburgh - 86 High Street	Roadside	Y	N	100	N	N	34

Diffusion Tube Bias Adjustment Factor in 2013

Three of the diffusion tubes are co-located with the continuous analyser on Musselburgh North High Street (Tube Numbers 23, 24 and 25). The bias adjustment factor has been calculated from the comparison of the diffusion tubes and continuous analyser measurements during 2013. The average for the co-located tubes was 30 $\mu g/m^3$. The average for the continuous analyser was 24 $\mu g/m^3$. This provided a diffusion tube bias adjustment factor of 0.8. This is considered acceptable given that the Bias Adjustment for the testing laboratory, Edinburgh Scientific Services is 0.75

The NO_2 results and bias adjustment calculations for period shown in Table 2.5 are shown in Appendix 3.

Table 2.6 Results of NO_2 Diffusion Tubes (2010 to 2013)

Site ID	Location	Site Type	Within AQMA?	Annual Mean Concentration (µg/m^3) - Adjusted for Bias [a]			
				2010 (Bias Adjustment Factor = 0.97)	2011 (Bias Adjustment Factor = 0.8)	2012 (Bias Adjustment Factor = 0.8)	2013 (Bias Adjustment Factor = 0.8)
1	Musselburgh – Newbigging Junction	Roadside	Y	32	30	30	30
4	Musselburgh - 87 High St	Roadside	Y	28	26	25	25
6	**Musselburgh – 147 High Street**	**Roadside**	**Y**	**49**	**40**	**43**	**42**
7	Musselburgh – 183 High St	Roadside	Y	**40**	36	39	37
8	Musselburgh - Mall Av	Roadside	N	26	24	24	24
9	Musselburgh – 45 Bridge Street	Roadside	N	33	26	27	26
10	Musselburgh – 150 North High St	Roadside	N	34	35	33	34
11	Tranent – 89 High St	Roadside	N	33	22	30	32
12	Tranent – 82 High St	Roadside	N	32	24	28	28
13	Tranent – 55 High Street	Roadside	N	34	29	28	28
14	Tranent – 26 High St	Roadside	N	33	33	26	24
15	Tranent – 58 Bridge St	Roadside	N	27	19	19	19
16	Haddington - Lyn Lea	Urban	N	11	12	8	8
23	Musselburgh - 133 N High St	Roadside	N	28	24	24	23
24	Musselburgh - 133 N High St	Roadside	N	30	24	25	24
25	Musselburgh - 133 N High St	Roadside	N	30	24	26	24
26	Wallyford - 116 Salters Rd	Roadside	N	31	26	23	23
27	Wallyford - 71 Salters Rd	Roadside	N	28	20	23	24
*28	Musselburgh - 15 Bridge Street	Roadside	N	N/A	N/A	29	26
*29	Musselburgh - 167 High Street	Roadside	Y	N/A	N/A	**42**	38
*30	Musselburgh - 137 High Street	Roadside	Y	N/A	N/A	34	30
***31**	**Musselburgh - 69 High Street**	**Roadside**	**Y**	N/A	N/A	**47**	**43**
*32	Musselburgh - 86 High Street	Roadside	Y	N/A	N/A	32	34

2.2.2 Particulate Matter (PM_{10})

Table 2.7 Results of Automatic Monitoring for PM_{10}: Comparison with Annual Mean Objective

Site ID	Site Type	Within AQMA?	Valid Data Capture for monitoring Period %	Confirm Gravimetric Equivalent (Y or NA)	Annual Mean Concentration μg/m^3				
					2009	2010	2011	2012	2013
Musselburgh – North High Street BAM	Roadside	N	84.2	Y	14	12	13	12	16

Table 2.8 Results of Automatic Monitoring for PM_{10}: Comparison with 24-hour Mean Objective

Site ID	Site Type	Within AQMA?	Valid Data Capture for monitoring Period %	Confirm Gravimetric Equivalent	Number of Exceedences of 24-Hour Mean (50 μg/m^3) (if data capture is less than 90%, include the 90.4th percentile of 24-hour means in brackets)				
					2009	2010	2011	2012	2013
Musselburgh – North High Street BAM	Roadside	N	84.2	Y	2	0	1 (30)	0	2 (32)

2.2.3 Sulphur Dioxide (SO_2)

East Lothian Council do not carry out any monitoring of sulphur dioxide

2.2.4 Benzene

East Lothian Council do not carry out any monitoring of benzene.

2.2.5 Other Pollutants Monitored

East Lothian Council do not carry out monitoring of any other pollutants.

2.2.6 Summary of Compliance with AQS Objective

East Lothian Council has examined the results from monitoring in the district.

Concentrations within the AQMA still exceed the annual mean objective for Nitrogen dioxide on Musselburgh High Street and the AQMA should remain.

Concentrations outside of the AQMA are all below the objectives at relevant locations, therefore there is no need to proceed to a Detailed Assessment.

3 New Local Developments

3.1 Road Traffic Sources

East Lothian Council can confirm that there are no new:

- Narrow congested streets with residential properties close to the kerb.
- Busy streets where people may spend one hour or more close to traffic.
- Roads with a high flow of buses and/or HGVs.
- Junctions.
- New roads constructed or proposed since the last Updating and Screening Assessment.
- Roads with significantly changed traffic flows.
- Bus or coach stations.

since the last Updating and Screening Assessment (Ref 19).

3.2 Other Transport Sources

East Lothian Council can confirm that there are no new:

- Airports.
- Locations where diesel or steam trains are regularly stationary for periods of 15 minutes or more, with potential for relevant exposure within 15m.
- Locations with a large number of movements of diesel locomotives, and potential long-term relevant exposure within 30m.
- Ports for shipping.

since the last Updating and Screening Assessment (Ref 19).

3.3 Industrial Sources

East Lothian Council can confirm that there are no new:

- **Industrial installations:** new or proposed installations for which an air quality assessment has been carried out.
- **Industrial installations:** existing installations where emissions have increased substantially or new relevant exposure has been introduced.
- **Industrial installations:** new or significantly changed installations with no previous air quality assessment.
- Major fuel storage depots storing petrol.
- Petrol stations.
- Poultry farms.

since the last Updating and Screening Assessment (Ref 19).

3.4 Commercial and Domestic Sources

East Lothian Council can confirm that there are no new:

- Biomass combustion plant – individual installations.
- Areas where the combined impact of several biomass combustion sources may be relevant.
- Areas where domestic solid fuel burning may be relevant.

since the last Updating and Screening Assessment (Ref 19).

3.5 New Developments with Fugitive or Uncontrolled Sources

East Lothian Council can confirm that there are no new:

- Landfill sites.
- Quarries.
- Unmade haulage roads on industrial sites.
- Waste transfer stations etc.
- Other potential sources of fugitive particulate emissions.

since the last Updating and Screening Assessment (Ref 19).

East Lothian Council confirms that there are no new or newly identified local developments which may have an impact on air quality within the Local Authority area.

East Lothian Council confirms that all the following have been considered:

- **Road traffic sources**
- **Other transport sources**
- **Industrial sources**
- **Commercial and domestic sources**
- **New developments with fugitive or uncontrolled sources.**

4 Local / Regional Air Quality Strategy

East Lothian Council has not considered developing a local or Regional Air Quality Strategy at this time.

5 Planning Applications

5.1 Proposed Combined Cycle Gas Turbine (CCGT) Power Station at site of Cockenzie coal-fired power station, Cockenzie

In October 2011 Scottish Power Generation Ltd were granted consent by the Scottish Ministers under Section 36 of the Electricity Act 1989 to construct and operate the 1000MW gas-fired combined cycle gas turbine ("CCGT") generating station and associated works at Cockenzie Power Station (Ref 24). The Air Quality Assessment that was carried out as part of the Environmental Assessment concluded that the development would not have any significant impact on air quality objectives. However, there is a potential for nuisance dust (particles >30um in diameter) during the construction phase for which appropriate mitigation measures will be introduced via the implementation of an Environmental Management Plan (EMP).

Decommissioning of the existing Coal-fired station commenced in April 2013 and is ongoing.

5.2 Proposed Mixed Use Development at Goose Bay, Wallyford

East Lothian Council has granted Planning permission in principle (ref 12/00924/PPM) for a mixed use development in Wallyford, which is located approximately 2.5km to the East of the existing AQMA in Musselburgh, including provision of 1050 residential units. The developer is now proposing an increase in the number of residential units up to a maximum of 1450.

At the time of the grant of consent, the proposal for 1050 residential units was predicted to result in a 3.5% increase in 24 hour traffic flow along Musselburgh High Street and it was considered that the existing AQMA on Musselburgh High Street was not significantly affected by the proposed Goose Bay development. This is in accordance with the 2010 EPUK guidance document: 'Development Control, Planning for Air Quality' (Ref 25) which states that a significant change in traffic volume within an AQMA is considered to be 5% or more. Therefore, further quantitative assessment for receptors within the AQMA, for potential impacts generated by the Goose Bay development, was not considered necessary at that time.

However, as a consequence of the proposed increase in number of residential units from 1050 to 1450 East Lothian Council has advised that an assessment into whether or not the proposed increase in number of housing units will result in a significant increase (+5%) in traffic volumes within the existing AQMA in Musselburgh will be required.

6 Air Quality Planning Policies

East Lothian Council do not have a general land use planning policy controlling the air quality impacts of development. However, the East Lothian Local Plan 2008, which was adopted in October 2008 (Ref 26), does contain various Policies under which Air Quality impacts are considered. The potential air quality effects of proposals for opencast coal extraction are recognised as one of a number of environmental considerations that must be addressed when considering such proposals and Council Policy is contained in Policy MIN4 (Ref 27). Furthermore, policy which guides development in the countryside, Policy DC1, (Ref 28) recognises that any development proposal must have no significant adverse impact on nearby uses, which would include air quality. Similarly, Council Policies for guiding development in built-up areas, Policies ENV1 (Ref 29) and ENV2 (Ref 30) require that the amenity impacts of development proposals be considered, particularly on existing residential uses. Again this would include considerations of air quality.

7 Local Transport Plans and Strategies

East Lothian Council has started on the process of producing a successor to the current Local Transport Strategy (LTS) which was published in 2001 although this has yet to be completed. Progress on completion and implementation of this Strategy will be included in future LAQM Review and Assessment Reports.

8 Climate Change Strategies

The East Lothian Environment Strategy (2010-15) (Ref 31) was published by East Lothian Community Planning Partnership (ELCPP) in December 2010 and formally adopted by East Lothian Council in January 2011.

In terms of mitigation the Strategy includes a long-term objective to reduce our ecological and carbon footprints by 80% by 2050 and to address adaptation the Strategy aims to build local resilience and pro-actively manage climate change impacts. The Strategy contains an Action Plan to facilitate the delivery of these objectives and an annual review of this Plan will be conducted to monitor progress. The first of these annual reviews will be undertaken in early 2012.

The Single Outcome Agreement (SOA) signals the beginning of a new relationship between the Scottish Government and the wider public sector. The purpose of the Single Outcome Agreement is to identify areas for improvement and to deliver better outcomes for the people of East Lothian and Scotland, through specific commitments made by community planning partners and the Scottish Government. Unlike many previous approaches, the SOA focuses upon outcomes (i.e. the results for / impact on the community) rather than specific processes or initiatives. Fundamentally the SOA is an agreement between the East Lothian Community Planning Partnership (ELCPP) and Scottish Government establishing what needs to be achieved, rather than how to achieve it.

One of the key local outcomes in the East Lothian Single Outcome Agreement (SOA) (2009-11) (Ref 32) is: East Lothian will be a less resource intensive, oil dependent county, by reducing its ecological and carbon footprints by 80% by 2050. Progress towards this outcome is monitored annually and can be viewed on the East Lothian Performs section of the ELCCP website at http://www.eastlothiancommunityplanning.org.uk/

Air Quality is also used as a performance indicator for the Local Outcome related to National Outcome 12 of the SOA: East Lothian has an attractive and healthy environment with a rich diversity of wildlife, habitats and distinctive historic built environments, which enhances peoples' lives. Conclusions and Proposed Actions

9 Implementation of Action Plans

In March 2014 East Lothian Council applied to the Scottish Ministers for funding support to assist with the development of their LAQM Action Plan and other associated LAQM work, including baseline Road Traffic Modelling. In May 2014 the Scottish Ministers awarded East Lothian Council financial support to assist with this work.

Following on from completion and acceptance of the conclusions of the Further Assessment and the 2014 Progress Report, by the Scottish Government and SEPA, East Lothian Council intends to use the predicted NOx emissions from the various modelled scenarios from the Further Assessment (Ref 22) to form the basis of its Action Plan and will report progress on this work in future LAQM Review and Assessment Reports.

10 Conclusions and Proposed Actions

10.1 Conclusions from New Monitoring Data

The results of new monitoring data indicate that the Objectives for all pollutants with the exception of NO_2, are being met.

Passive monitoring of Nitrogen dioxide on Musselburgh High Street continues to indicate concentrations at locations that have exceeded, or are very close to, the Annual Mean Objective. Accordingly, an Air Quality Management Area was declared in November 2013 (Ref 21) in Musselburgh in relation to breaches and likely breaches of the Nitrogen Dioxide annual mean air quality objective (as specified in the Air Quality (Scotland) Regulations 2000 (Ref 4) as amended by the Air Quality (Scotland) Amendment Regulations 2002 (Ref 5).

In summer 2012 East Lothian Council introduced a system of Urban Traffic Control in Musselburgh using the SCOOT (Split Cycle Offset Optimisation Technique) system which monitors queue lengths at all junctions on the main arterial routes and alters signal timing to reduced congestion. The system is now fully operational and initial indications are that emissions of NO2 have reduced from time of introduction to 2013, albeit it marginally. It is hoped that further optimisation of the system will result in a positive impact on pollutant levels on Musselburgh High Street.

The results of automatic monitoring of PM_{10} confirm that both the annual and 24-hour mean objectives continue to be met although there has been a noted increase in PM_{10} levels in 2013. PM_{10} levels will continue to be monitored to ensure compliance with Air Quality Objectives

10.2 Conclusions relating to New Local Developments

East Lothian Council confirms that there are no new or newly identified local developments which may have an impact on air quality within the Local Authority area.

East Lothian Council confirms that all the following have been considered –

- Road traffic sources
- Other transport sources
- Industrial sources
- Commercial and domestic sources
- New developments with fugitive or uncontrolled sources.

10.3 Proposed Actions

Following completion of the Further Assessment of Nitrogen Dioxide in Musselburgh in 2014 (Ref 22) there is no need to revoke or amend the existing AQMA and an Action Plan will be developed that may involve an integrated package of interventions to provide the best reductions in NOx. Meausres to be considered will likely focus on reducing overall traffic, reducing queuing and reducing bus numbers.

It is hoped that the Action Plan will be completed by Summer 2015 and progress towards achieving this will be outlined in the next round of LAQM Review and Assessment, Round Six, commencing with the Updating and Screening Assessment due for submission by April 2015.

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Appendices

Appendix 1: Summary of Previous Rounds of Review and Assessment

Summary of Previous Review and Assessment Reports				
ROUND	**REPORT TYPE**	**REPORT DUE DATE**	**REPORT COMPLETION DATE**	**CONCLUSIONS**
2	**Updating & Screening Assessment**	**April 2003**	March 2004	No further assessments required for **Carbon Monoxide, Benzene, Lead and 1,3-Butadiene**. Detailed Assessments required for: **Nitrogen Dioxide** due to road traffic sources in Musselburgh High St **Sulphur Dioxide** due to industrial sources (Cockenzie Power Station and Lafarge Cement Works) **PM10** due to road traffic sources in Musselburgh High St and North High St and also due to industrial source (Cockenzie Power Station)
2-1	**Detailed Assessment**	**April 2004**	**April 2005**	**Nitrogen Dioxide** due to road traffic in Musselburgh High St expected to meet Objectives by target year of 2005. No Further Assessment required at this time. **Sulphur Dioxide** in vicinity of Cockenzie Power Station was not forecast to exceed Objectives. 15-minute mean Objective forecast to be slightly exceeded in vicinity of Lafarge Cement Works, although abatement equipment to be installed should ensure that Objective will be met. No further assessments required at this time. PM10 **Annual Mean Objective forecast to be exceeded in Musselburgh High St due to roadwork's and Cockenzie due to emissions from Coal Plant at Cockenzie Power Station. However, results were based on Osiris monitoring system and use of correction factors. Further Assessments to be carried out by East Lothian Council using TEOM Analyser for road traffic sources in Musselburgh and by SEPA using Gravimetric Sampler for industrial source in Cockenzie.**
2-2	**Progress Report**	**April 2005**	**August 2005**	**Nitrogen Dioxide** levels due to road traffic sources continue to comply with Objectives within Musselburgh and throughout East Lothian. PM10 **Further Assessments due to road traffic sources in Musselburgh and industrial source in Cockenzie still to be completed and results to be incorporated in Updating and Screening Assessment Report due in April 2006.**
3	**Updating & Screening Assessment**	**April 2006**	**August 2006**	No exceedences of any Objectives forecast. No Further Assessments required
3-1	**Progress Report**	**April 2007**	**July 2007**	**Nitrogen Dioxide** levels due to road traffic sources in Musselburgh and proposed expansions of Musselburgh Racecourse and Wallyford Village continue, and are forecast, to comply with Objectives. **PM10** levels due to road traffic in Musselburgh complied with using local correction factor but exceeded using national correction factor. TEOM unit to be replaced with a BAM unit following results of Equivalence Study carried out by DEFRA.
3-2	**Progress Report**	**April 2008**	**February 2009**	**Nitrogen Dioxide** levels due to road traffic sources in Musselburgh and proposed expansions of Musselburgh Racecourse and Wallyford Village continue, and are forecast, to comply with Objectives. Passive monitoring to be introduced in Wallyford. **PM10** levels due to road traffic in Musselburgh complied with using local correction factor but exceeded using national correction factor. TEOM unit replaced with a BAM unit in March 2008 and results from new monitor to be incorporated into Updating and Screening Assessment Report due in April 2009. Sulphur Dioxide **in vicinity of Lafarge Cement works continues to comply with Objectives**

Summary of Previous Review and Assessment Reports				
Round	**Report Type**	**Report Due Date**	**Report Completion Date**	**Conclusions**
4	**Updating & Screening Assessment**	**April 2009**	**November 2009**	**PM10 and Nitrogen Dioxide** levels in Musselburgh will require to be subject of a Detailed Assessment due to the Biomass Unit located at Queen Margaret University. The results of the Updating and Screening Assessment carried out for all other pollutants indicates that current Air Quality Objectives are being complied with.
4-1.1	**Detailed Assessment of Nitrogen Dioxide and PM10 due to QMU Biomass Unit**	**2010**	**October 2010**	**PM10 and Nitrogen Dioxide** levels continue to be met
4-1	**Progress Report**	**April 2010**	**October 2010**	All AQO's being complied with
4-2	**Progress Report**	**April 2011**	**June 2011**	Detailed Assessment of **Nitrogen Dioxide** required for Musselburgh High Street. All other AQO's being complied with.
4-2.1	**Detailed Assessment of Nitrogen Dioxide in Musselburgh due to Road Traffic**	**2012**	**May 2012**	AQMA required for Bridge Street and High Street due to forecast exceedence of Annual Mean AQO if additional monitoring confirms predicted exceedences.
5	**Updating &Screening Assessment**	**April 2012**		AQMA required for Bridge Street and High Street due to forecast exceedence of Annual Mean AQO ***if additional monitoring confirms predicted exceedences in 2012.***
5-1	**Progress Report**	**April 2013**	**August 2013**	AQMA to be declared in Musselburgh in relation to exceedences of NO2 Annual Mean Objective. Further Assessment to be commissioned.
5-2	**Further assessment**	**November 2014**	**June 2014**	It is estimated that ambient NOx reductions in the AQMA of between 0% and 27% are required in order to achieve compliance with the annual mean NO2 objective. The source apportionment exercise indicates that emissions from buses form the largest contribution at all locations along the High St AQMA. Modelling of the mitigation scenarios agreed with the Council indicates that an integrated package of interventions would provide the best NOx reductions. Measures that reduce overall traffic, reduce queuing and reduce bus numbers, where appropriate, will reduce road NOx significantly.
5-3	**Progress Report**	**April 2014**	**August 2014**	Monitoring results for 2013, indicate that the current AQMA boundary includes all relevant sources and does not require revocation or amendment at this time.

Appendix 2: Ratified Data for 2013

Produced by Ricardo-AEA on behalf of the Scottish Government

EAST LOTHIAN MUSSELBURGH N HIGH ST
1st January to 31st December 2013

These data have been fully ratified by Ricardo-AEA

POLLUTANT	PM_{10}+	NO_2	NO_X
99.8th percentile of hourly means	-	101 µg m^{-3}	323 µg m^{-3}
98.08th percentile of daily means	46 µg m^{-3}	-	-
Maximum hourly mean	177 µg m^{-3}	132 µg m^{-3}	697 µg m^{-3}
Maximum daily mean	72 µg m^{-3}	79 µg m^{-3}	231 µg m^{-3}
Average	16 µg m^{-3}	24 µg m^{-3}	50 µg m^{-3}
Data capture	84.2 %	81.3 %	81.3 %

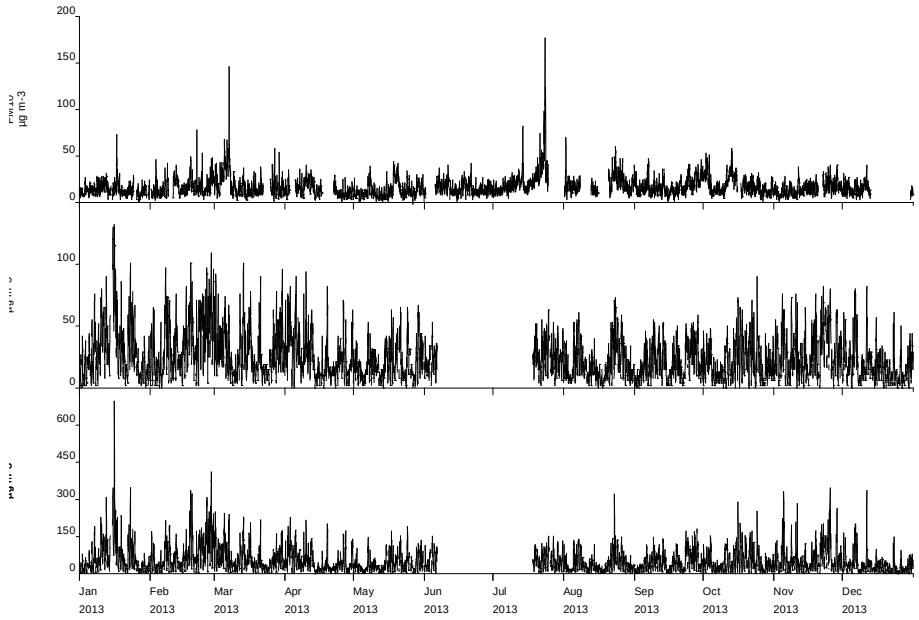
+ PM_{10} instruments:
BAM using a gravimetric factor of 0.83333 for Indicative Gravimetric Equivalent from 1 January 2013.
All gaseous pollutant mass units are at 20°C and 1013 mb. Particulate matter concentrations are reported at ambient temperature and pressure.
NO_X mass units are NO_X as NO_2 µg m^{-3}

Pollutant	Air Quality Regulations (2000) and Air Quality (Scotland) Amendment Regulations 2002	Exceedences	Days
PM_{10} Particulate Matter (Gravimetric)	Daily mean > 50 µg m^{-3}	2	2
PM_{10} Particulate Matter (Gravimetric)	Annual mean > 18 µg m^{-3}	0	-
Nitrogen Dioxide	Annual mean > 40 µg m^{-3}	0	-
Nitrogen Dioxide	Hourly mean > 200 µg m^{-3}	0	0

Note: For a strict comparison against the objectives there must be a data capture of >90% throughout the calendar year

Produced by Ricardo-AEA on behalf of the Scottish Government

East Lothian Musselburgh N High St (Combined) Hourly Mean Data for 1st January to 31st December 2013



Date Created:

08/04/2014

Appendix 3: NO_2 Results and Bias Adjustment Calculation

Nitrogen dioxide Diffusion Tube Results in 2013 (01/01/13 – 31/12/13)

Site ID	Location	2013												AVERAGE	Data Capture %	BIAS ADJUSTED ()
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec			
1	Musselburgh – Newbigging Junction	41	46	38	4	48	28	40	39	35	40	55	36	38	100	30
4	Musselburgh - 87 High St	35	40	35	30	25	26	20	26	28	35	43	32	31	100	25
6	Musselburgh – 147 High Street	39	68	59	59	50	56	66	48		56	52	31	**53**	91.7	**42**
7	Musselburgh – 183 High St	41	60	47	40	50	41	56	42	47	49	51	32	**46**	100	37
8	Musselburgh - Mall Av	31	40	38	23	26	22	26	25	29	31	37	29	30	100	24
9	Musselburgh – 45 Bridge Street	37	53	47	26	32	27	32	22	32	25	34	23	33	100	26
10	Musselburgh – 150 North High St	43	63	35	38	34	36	34	41	42	49	48	38	**42**	100	34
11	Tranent – 89 High St	37	61	33	34	38	39	38	39	42	39	50	34	40	100	32
12	Tranent – 82 High St	31	53	51	25	32	28	33		58	28	29	17	35	91.7	28
13	Tranent – 55 High Street	38	52	40	28	30	29	31	31	37	31	41	30	35	100	28
14	Tranent – 26 High St	35	50	53	18	30	25	30	21	32	26	21	13	**30**	100	24
15	Tranent – 58 Bridge St	23	35	22		23	21		20	23	23	31	20	24	83.3	19
16	Haddington - Lyn Lea	11	17	10	11	8	10		1			17	7	10	75	8
23	Musselburgh - 133 N High St	25	47	31	25	28	27	28	23	28	30	33	23	29	100	23
24	Musselburgh - 133 N High St	25	47	37	27	28	25	30	25	29	32	36	19	30	100	24
25	Musselburgh - 133 N High St	28	48	32	24	29	27	29	27	31	28	36	22	30	100	24
26	Wallyford - 116 Salters Rd	25	39	32	23	29	29	27		28	29	35	22	29	91.7	23
27	Wallyford - 71 Salters Rd	27	43	27	19	28	23	25		29	31	44	29	30	91.7	24
*28	Musselburgh - 15 Bridge Street	29	52	34	29	34	29	32	27	33	35	37	22	33	100	26
*29	Musselburgh - 167 High Street	43	65	56	53	45	49	58	43	41	48	44	26	48	100	38
*30	Musselburgh - 137 High Street	37		39	41	37	37	42	32	35	37	42	30	37	100	30
*31	Musselburgh - 69 High Street	43	67	58	56	49	57	64	45	53	56	64	39	54	100	**43**
*32	Musselburgh - 86 High Street	45	57	41	34	37	35	26	35	39	71	49	39	42	100	34

Method	Average for period ($\mu g/m^3$)
Analyser	24
Tubes	29.7
BIAS ADJUSTMENT	**0.8**