Ricardo
Energy & Environment

Hastings Air Quality Management Area revocation report (2017)

Report for Hastings Borough Council

ED 10065001 | Issue Number 1 | Date 06/03/2017

Customer:

Hastings Borough Council

Customer reference:

Hastings AQMA revocation report 2017

Contact:

Nigel Jenkins
Ricardo Energy & Environment
Gemini Building, Harwell, Didcot, OX11 0QR, United Kingdom

t: +44 (0) 1235 753 107

e: nigel.jenkins@ricardo.com

Ricardo-AEA Ltd is certificated to ISO9001 and ISO14001

Author:

Nigel Jenkins

Approved By:

Beth Conlan

Date:

06 March 2017

Ricardo Energy & Environment reference:

Ref: ED10065001-Hastings AQMA revocation - Issue 1

Local Authority Officer	Stewart Bryant
Department	Environmental Health Services
Address	Hastings Borough Council Aquila House, Breeds Place Hastings East Sussex TN34 3UY
Telephone	01424 783282
e-mail	sbryant@Hastings.gov.uk
Report Reference number	ED10065001
Date	06 March 2017

Table of contents

Appendices

1 Introduction

This report was produced on behalf of Hastings Borough Council and constitutes the required information under which the Council is to apply for a revocation of the Air Quality Management Area [AQMA 1] along the A259 (Bexhill Road) in Bulverhythe, Hastings.

This Air Quality Management Area revocation report has been developed in recognition of the legal requirement on the local authority to work towards Air Quality Strategy (AQS) objectives under Part IV of the Environment Act 1995 and relevant regulations made under that part and to meet the requirements of the Local Air Quality Management (LAQM) statutory process.

This report will provide the Council with robust evidence as required under the LAQM guidance; LAQM.PG(16) and LAQM.TG (16), to enable it to revoke the Air Quality Management Area. The report will:

- demonstrate that air quality objectives are being met and will continue to do so,
- show compliance with air quality objectives for three years or more prior to revocation,
- provide evidence that the AQMA may be revoked following a screening assessment or on the basis of robust monitoring evidence,
- in addition, consider measurements carried out over several years or more, national trends in emissions, as well as local factors that may affect the AQMA, including measures introduced as part of the Air Quality Action Plan, together with information from national monitoring on high and low pollution years.

2 Local Air Quality Management

2.1 Review and assessment of air quality

Under the Environment Act 1995 local authorities are required to review and assess local air quality annually against national air quality objectives. This process sits under the Local Air Quality Management (LAQM) programme which requires local authorities to report annually to the Department for Environment, Food and Rural Affairs (Defra).

The air quality objectives applicable to LAQM in England are set out in the Air Quality (England) Regulations 2000 (SI 928) and the Air Quality (England) (Amendment) Regulations 2002 (SI 3043). The air quality objectives applicable in England are detailed in Appendix A.

2.2 Air quality monitoring

Hastings BC undertakes air quality monitoring across the borough using automatic air quality monitoring and passive diffusion tube sampling methods for LAQM reporting purposes. The location of sampling locations is provided in Appendix B with monitoring results presented in Appendix C.

2.2.1 Automatic monitoring

Hastings BC operates a static road-side air quality monitoring station (AQMS) located on the Bexhill Road within the AQMA at Bulverhythe.

The AQMS monitors both nitrogen dioxide (NO_2) and Particulate Matter (PM_{10}) using:

- TAP 200 series NOx chemiluminescent analyser, measuring NO_2
- Thermo TEOM 1400 PM_{10} monitor which performs a filter based direct mass measurement for determining particulate matter mass concentrations.

This site at Bulverhythe forms part of the Sussex Air Quality Network. Further information, including site description and monitoring data, can be obtained from the following web link: http://www.sussex-air.net/Hastings AQMS

2.2.2 Non-automatic NO_2 monitoring

Hastings Borough Council undertakes non- automatic (passive) monitoring of NO_2 at 14 sites across the Borough, with 2 locations situated within the AQMA (Harley Shute and Bexhill Road Boat). Further detailed information is provided in the Hastings BC Annual Status Report (ASR) 2016[1].

2.2.3 QA/QC of monitoring data

All monitoring data is present with robust QA/QC, refer to Appendix D for further details.

3 Hastings Air Quality Management Area

Hastings Borough Council declared an AQMA along the A259 (Bexhill Road) to the west of Hastings in the Bulverhythe area due to exceedances of the PM_{10} 50 µg m^{-3} daily mean air quality objective in December 2003. The air quality objective relevant to the Hastings AQMA are for particles less than 10 microns (PM_{10}) in size.

Table 3-1: Air Quality Objectives for PM_{10}.

Pollutant	Air Quality Objective Concentration	Measured as
Particles (PM_{10}) (Gravimetric)	50 µg.m^{-3} not to be exceeded more than 35 times a year	24-hour mean
	40 µg.m^{-3}	Annual mean

PM_{10} has been measured at Bulverhythe since 2001. The annual mean PM_{10} concentration has never exceeded the annual objective concentration of 40 µg m^{-3}. However, exceedances of the 50 µg m^{-3} daily mean objective concentration were measured and led to a declaration of an AQMA. A summary of the AQMA declared by Hastings Borough Council can be found in Table 3-2.

Table 3-2 Declared Air Quality Management Areas

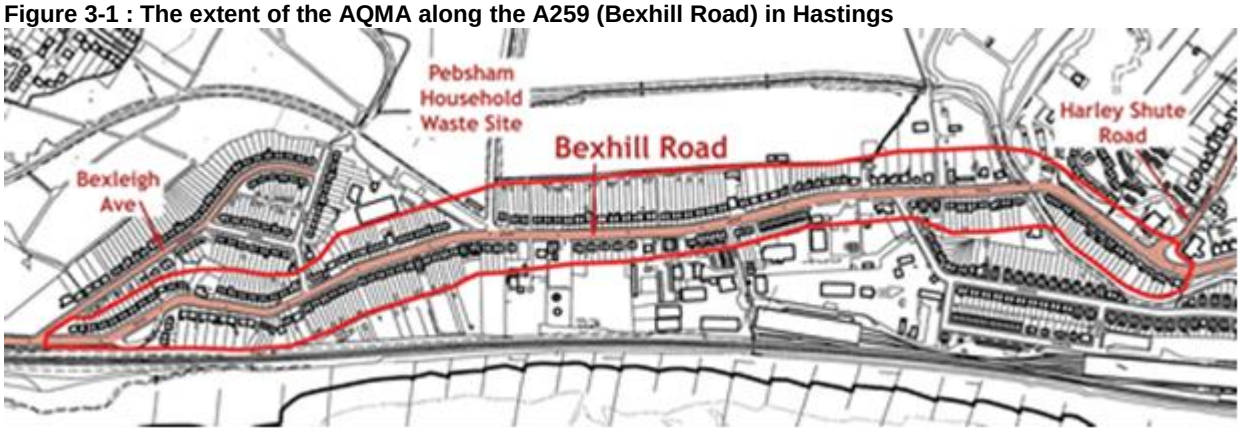
AQMA Name	Pollutants and Air Quality Objectives	City / Town	One Line Description	AQMA on LAQM website
AQMA 1	• PM_{10} 24-hour mean	Bulverhythe, Hastings	An area encompassing properties between the junction of the A259 (Bexhill Road) and Harley Shute Road, and number 576 Bexhill Road on its northern side, and numbers 211 to 585 Bexhill Road on its southern side.	https://uk-air.defra.gov.uk/aqma/local-authorities?la_id=123

The AQMA road section includes residential properties on both sides of the A259 and an access road to the Pebsham household waste site (also known as Freshfields). At the time of the declaration the waste site was in full operation, handling local waste transferred by HGVs accessing the A259 and trailing dust and debris from the site onto the road. The A259 was also at the time the main route into Hastings from Bexhill (to west) carrying > 30,000 annual average daily traffic (AADT). In addition, the AQMA is adjacent to the coastline (to the south), which also contributes sea-salt to the measured PM_{10}.

Figure 3-1 shows the extent of the AQMA along the A259 (Bexhill Road) in Hastings.

[1] http://www.hastings.gov.uk/environmentalhealth/pollution/air/air_management/

Figure 3-1 : The extent of the AQMA along the A259 (Bexhill Road) in Hastings

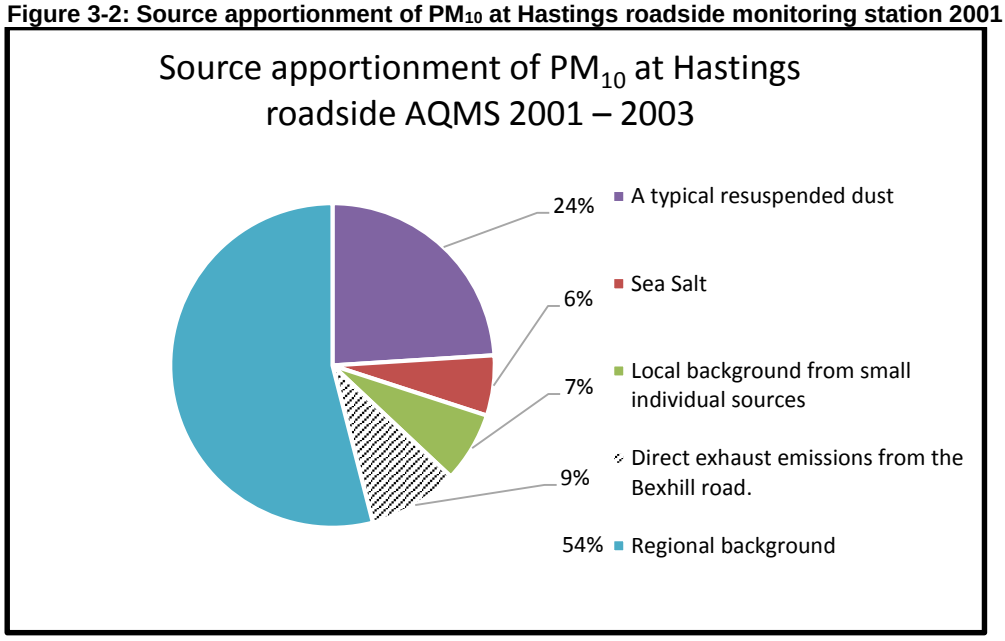


3.1 Local sources of pollution

The source apportionment of road-side emissions of PM_{10} carried out after the initial declaration (2005), identified a range of particulate emission sources specific to the area of the AQMA. Background regional concentrations dominated the profile of PM_{10} at the roadside with 54% of the total, followed by re-suspended dusts (24%), exhaust emissions (9%), local source emissions (7%) and sea salt (6%). The emission sources of PM_{10} at the time of the AQMA declaration at the AQMS are shown in **Figure 3-2**.

- Regional Background: PM_{10} that arises from atmospheric chemistry involving emissions made some distance from Hastings. Includes industrial emissions, pollen, wind-blown soils etc.
- Sea Salt: PM_{10} that is caused by the evaporation of seawater that has been placed in the atmosphere by wave action.
- Direct exhaust emissions: PM_{10} that is emitted by the tailpipes of vehicles using the A259.
- Local Background: Locally produced PM_{10} arising from local industry, bonfires, boilersetc. No known significant single sources.
- A typical re-suspended dust: PM_{10} that is being measured locally, that is not related to the direct emissions from vehicle tailpipes, that is probably produced by the mechanical passing of vehicles on the road and that is additional to any similar such dust levels measured at other monitoring stations.

Figure 3-2: Source apportionment of PM_{10} at Hastings roadside monitoring station 2001 – 2003



3.2 Hastings Air Quality Action Plan (2005)

The source apportionment enabled Hastings BC to identify sources of PM_{10} pollution and target measures for their Air Quality Action Plan (2005). The Council, or other bodies responsible, targeted local actions that could influence reductions in the emissions of particulate arising from:

- Exhaust emissions along the Bexhill road and
- A-typical resuspension from the A259

The Hastings Air Quality Action Plan (2005) and following LAQM review and assessment reports describe the actions and measures employed to reduce emissions.

4 Requirements for revoking an AQMA

The process for revoking an AQMA is set out in DEFRA Local Air Quality Management Policy and Technical Guidance 2016 (LAQM.PG(16) & LAQM.TG(16)), key points of note are:

LAQM.PG(16) sections 4.9 to 4.11 set out the policy elements of revoking an AQMA:

- For revocation this should demonstrate that air quality objectives are being met and will continue to do so. In other words, they should have confidence that the improvements will be sustained. Compliance with air quality objectives should be for three years or more prior to revocation.

- Where an Order is revised, a copy of the revocation or amendment Order should be submitted to Defra and other statutory consultees and made publicly available to ensure the public and local businesses are aware of the situation. It is expected that the local authority will take the relevant action imposed by the Order within four months following receipt of comments from Defra.

- Following a revocation, ideally the local authority should put in place a local air quality strategy (para 2.12) to ensure air quality remains a high profile issue and to ensure it is able to respond quickly should there be any deterioration in conditions.

LAQM.TG(16)) sections 3.46 to 3.48 set out the technical elements of revoking an AQMA:

- LAQM.TG(16) 3.46 states “the decision to amend or revoke an AQMA should only be taken following a detailed study, … This should set out in detail all the available information used to reach the decision, with the same degree of confidence as was provided for the original declaration.” However, 3.47 follows on with the statement “**in some instances if compelling evidence exists, detailed modelling to support the decision to amend/revoke an AQMA may not be necessary and an AQMA may be amended or revoked following a screening assessment or on the basis of robust monitoring evidence**”.

- Section 3.48 thereafter qualifies this statement by stating “pollutant concentrations may vary significantly from one year to the next, due to the influence of meteorological conditions, and it is important that authorities avoid cycling between declaring, revoking and declaring again, due simply to these variations. Therefore, before revoking an AQMA on the basis of measured pollutant concentrations, the authority therefore needs to be reasonably certain that any future exceedances (that might occur in more adverse meteorological conditions) are unlikely. For this reason, it is expected that authorities will need to consider measurements carried out over several years or more, national trends in emissions, as well as local factors that may affect the AQMA, including measures introduced as part of the Air Quality Action Plan, together with information from national monitoring on high and low pollution years.”

Therefore, an authority will need to provide either:

1. A screening assessment with robust monitoring evidence over several years (3.47) to demonstrate current and future year compliance (3.48).

or

2. A detailed measurement and modelling assessment similar to that undertaken to declare the AQMA (3.46)

This document is a screening assessment report for Hastings Borough Council, providing robust monitoring evidence over several years to demonstrate current and future year compliance. It's not considered that detailed modelling is required.

5 Hastings AQMA revocation evidence

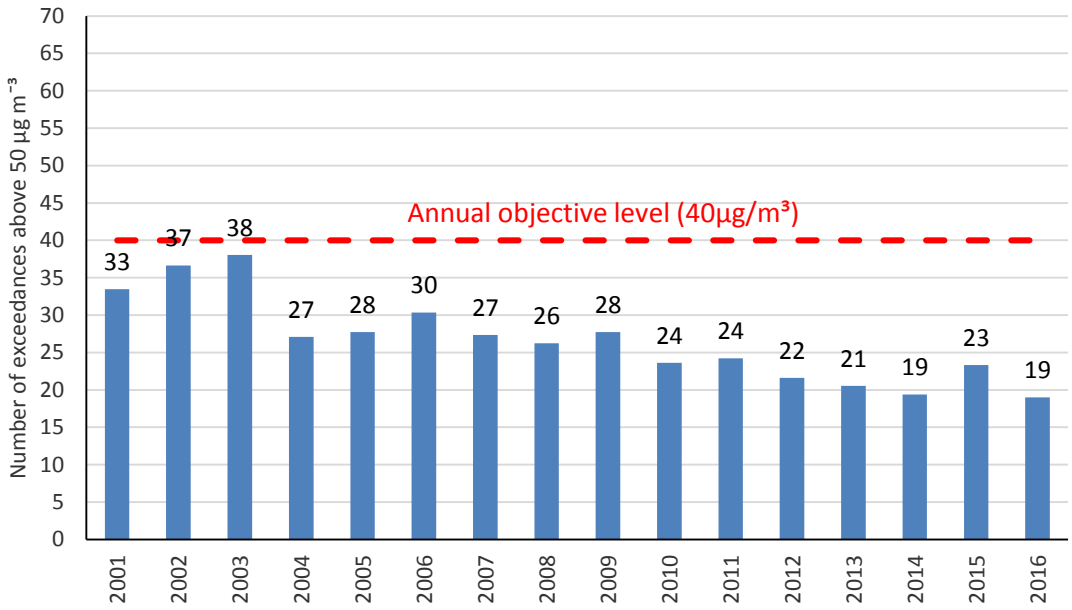
5.1 Monitored air quality improvements

Measurements of PM_{10} and NO_2 have been taken over a number of years since the declaration in 2003 for exceedance on the PM_{10} daily objective. The following robust monitoring data and trends shows that air quality in Hastings is no longer in breach of any air quality objectives. All monitoring data is presented in Appendix C.

5.1.1 PM_{10} monitoring results and trends

Ratified and gravimetric adjusted PM_{10} annual mean concentrations for the past 6 years were compared to the air quality objective of 40 μgm^{-3}. Figure 5-1 shows that the measured annual mean concentration was significantly below the annual objective concentration. Note that the 2016 data is un-ratified (at date of report) but continues to show concentrations of PM_{10} are well below the objective level.

Figure 5-1: Annual mean PM10 concentration measured at Bulverhythe.

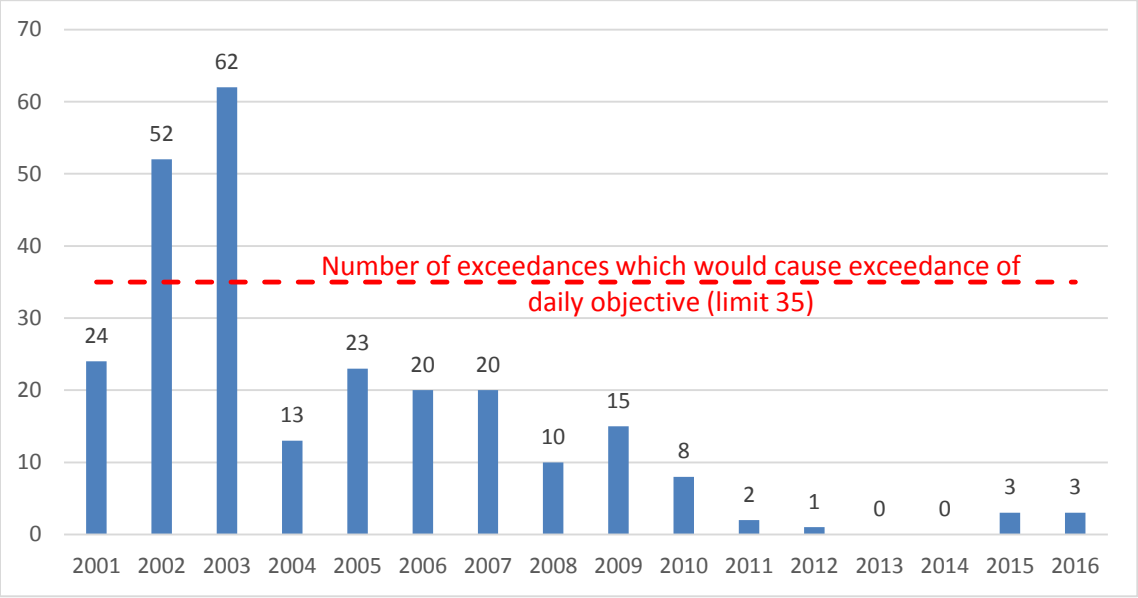


PM_{10} monitoring over the last 16- years (2001 - 2016) has shown that there has been no breach of the annual mean objective (40 μgm^{-3}).

Ratified and adjusted (gravimetric) PM_{10} daily mean concentrations for the past 12 years (2004 – 2016) were compared to the air quality objective of 50 μgm^{-3}, not to be exceeded more than 35 times a year. Note that the 2016 data is un-ratified (at date of report).

Figure 5-2 shows that the measured daily mean number of exceedances were significantly below the limit of 35 days per year since 2004.

Figure 5-2 Number of exceedances of daily mean objective of 50 µg m^{-3} at Bulverhythe since 2004.



PM_{10} monitoring over the last 16 - years (2011- 2016) has shown that there has been no breach of the daily mean objective since 2003 (50 μgm^{-3} 35 times in a year).

5.1.2 NO_2 monitoring results and trends

Additionally, measurements of NO_2 have seen similar reduction trends and not likely to breach air quality objectives in the future. Results are presented in Appendix C Table A 4 and Table A 5.

The ratified continuous automatic monitored NO_2 results for the past 5 years (2011 – 2015) were compared to the air quality objectives:

- annual mean air quality objective of 40 µg m^{-3}
- 1-hour mean air quality objective of 200 µg m^{-3}, not to be exceeded more than 18 times per year

Results from the automatic NO_2 monitoring also showed no exceedance of either annual or 1-hour mean air quality objective over the past 5 years (2011 – 2015).

Additionally, the ratified non-automatic monitored NO_2 results for the past 3 years (2013 – 15), since AQMA non-automatic monitoring was started, were compared to the air quality objectives:

- annual mean air quality objective of 40 µg m^{-3}
- 1-hour mean air quality objective of 200 µg m^{-3}, not to be exceeded more than 18 times per year

Results from the non-automatic NO_2 monitoring showed no exceedance of the annual air quality objective (40 µg.m^{-3}) within the AQMA over the past 3 years (2013 – 2015). Additionally, the annual average concentrations at diffusion tube sites were significantly less than 60 µg.m^{-3}. It is therefore highly unlikely that there is exceedance of the 1-hour mean objective at these sites.

5.2 National trends in emissions and pollutant concentrations

Nationally emissions of pollutants to air have shown a consistent decline especially in the transport sector. Transport emissions decline year-on-year through the introduction of stricter European emissions standards (Euro standards) and through the turn-over of UK fleet, with older (less clean) vehicles being removed over time.

The latest Emissions of Air Pollutants (1990 – 2014)[2] report published in 2016 provides the latest reducing trends in emissions across the UK sectors, showing a steady decline in emissions from PM and NO_x amongst others. National Atmospheric Emissions Inventory (NAEI) data details emissions trends identifying that overall UK emissions of PM_{10} have decreased by 50% since 1990.

Local background sources of PM_{10}, provided from the NAEI[3] background (1km x 1km) grid for 2013 (base year) show that local PM_{10} is dominated by residual (sea) salt (50%) with secondary sources (43%) making up the majority of the PM_{10} background concentrations. Road transport emissions including brake and tyre wear contribute only 2.8% of the background PM_{10}.

The background PM_{10} is composed of both short and long range particulate sources bought in from industrial, agricultural, domestic or cross-channel/transboundary sources. In the case of the Hastings AQMA location the background concentrations are dominated by sea-salt due to its proximity to the channel.

Local (projected) total background concentrations of PM_{10}, provided from the NAEI[4] show a progressive downward trend in background concentrations toward 2025. The total background concentrations of PM_{10} from 2013 (base year) – 2025 are presented in Table 5-1.(Hastings AQMA data grid reference: 577500, 108500).

Table 5-1: Hastings AQMA background concentration projections of PM_{10}.

Concentrations of PM_{10} (µg m^{-3})	2013	2016	2020	2025
Total	14.36	13.88	13.45	13.20

The projected down trend in background PM_{10} concentrations supports the proposal of the revocation of the AQMA as background concentrations are set to reduce by 0.9 µg m^{-3} from 2013 – 2020 and projected to fall by a further 0.25 µg m^{-3} over the following 5 years.

[2] https://uk-air.defra.gov.uk/assets/documents/reports/cat07/1609130906_NAEI_AQPI_Summary_Report_1990-2014_Issue1.1.pdf
[3] http://uk-air.defra.gov.uk/data/lagm-background-home
[4] http://uk-air.defra.gov.uk/data/lagm-background-home

5.3 On-going Action Plan measures and initiatives

Hastings BC and East Sussex County Council continue to be active on measures and initiatives to improve air quality across the borough. Details of individual actions and initiatives are provided in the Hastings BC ASR 2016 in table 2-2 (Progress on Measures to Improve Air Quality). Table 2-2 includes local factors that have so far improved air quality (detailed in the following section 5.4) as well as other planned initiatives including:

- Promoting travel alternatives/low emission transport
  - Council travel plans
  - Electric vehicle infrastructure (rapid, fast and slow)
  - Taxi licencing review and incentives
- Traffic management
  - SCOOT system in place to manage traffic flow and congestion on A259
- Planning guidance
  - Guidance to reduce emissions from planned developments with AQAM and across Hastings.

5.4 Local factors that have improved air quality

Hastings BC and East Sussex County Council has taken forward a number of measures since the declaration of the AQMA, in pursuit of improving local air quality. Details of all measures completed, in progress and planned are set out in the Hastings BC ASR 2016. Key actions that have influenced the reduction in emissions and resultant PM_{10} (and NO_2) concentrations are set-out below.

5.4.1 Closure of Pebsham waste transfer site in 2008.

The Pebsham landfill site on Freshfields Lane adjacent to the AQMA was operational until 2008. Vehicles using the site, predominantly HGVs, contributed to local emission of PM_{10} and NO_x via tail-pipe emissions and re-suspension of dust taken off the site. The site was only accessible from the A259.

Longer term traffic data (2005 – 2016) is presented in Appendix E (Table A 6) shows a decline in both total and HGV traffic after the closure of the waste transfer site in 2008. Total traffic AADT declined by approx. 2% in 2009 and HGV movements significantly declined by 730 or 36% when compared to 2008 data.

The closure of Pebsham landfill site in 2008 contributed to reductions in particulate emissions on the A259. The exact impact on the reduction is difficult to quantify, however it's likely that the reduction in HGVs using Freshfields Lane will have reduced tail-pipe emissions in conjunction with reduced transfer of site dust from vehicles onto the A259.

5.4.2 Opening of the Bexhill to Hastings link road December 2015

The Link Road (Coombe Valley Road) between Bexhill and Hastings is a 3.5-mile single carriageway road from the A269/A259 junction in Bexhill to Queensway in Hastings. The Link Road was proposed to remove traffic from the congested and polluted A259, which carries over 30,000 vehicles every day.

The Link Road opened in December 2015 and one year on the Link road is carrying a traffic volume of 16,000 vehicles (2016)[5]. The average speed of vehicles on the Link Road (East & West bound)

[5] Northern count site on Combe Valley Way (ESCC ID 226)

was 52mph. Traffic volumes measured on the A259 grew to approximately 30,000 vehicles per day (Annual Average Daily Traffic/ AADT) from 2011 through to 2015. The resulting traffic volumes reduced significantly in 2016 from 30,330 to 23,650 AADT or 22% when compared to 2015. Additionally, HGV traffic also reduced on the A259 by 18% over the same period (from 1344 to 1097 AADT) as detailed in Appendix E.

The Hastings – Bexhill Link Road contribution to reductions in particulate emissions on the A259 are difficult to quantify but the following indicators show positive benefit to emissions reductions through:

- **A259 traffic reductions (-22%)**
- **A259 HGV reductions (-18%)**

5.4.3 Future supporting transport activities

Hastings BC and East Sussex County Council also expect the following additional measures to be completed over the course of the next reporting year (2016/17) to sustain the improvements gained to date through:

- Queensway Gateway Road due to be started in 2016.
- Proposed dedicated bus lane along the A259 from Filsham Road to Glyne Gap to improve the flow of traffic is to be put in place 2016/17.

6 Evidence summary.

The evidence compiled in this report supports the recommendation to revoke the current Hastings [AQMA 1] PM_{10} Air Quality Management Area.

This report has provided the following evidence from measurements and emissions trends:

1. PM10 monitoring over the last 16 years (2001- 2015) has shown that there has been no breach of the annual mean objective (40 μgm^{-3}).

2. PM_{10} monitoring over the last 16 years (2001 - 2016) has shown that there has been no breach of the daily mean objective since 2003 (50 μgm^{-3} 35 times in a year).

3. Results from the automatic NO_2 monitoring also showed no exceedance of either annual or 1-hour mean air quality objective over the past 5 years (2011 – 2015).

4. Results from the non-automatic NO_2 monitoring showed no exceedance of the annual air quality objective (40 $\mu g.m^{-3}$) within the AQMA over the past 3 years (2013 – 2015).
   a. Additionally, the annual average concentrations at diffusion tube sites were significantly less than 60 $\mu g.m^{-3}$. It is therefore highly unlikely that there is exceedance of the 1-hour mean objective at these sites.

5. The projected down trend in background PM10 concentrations supports the proposal of the revocation of the AQMA as background concentrations are set to reduce by 0.9 $\mu g/m^3$ from 2013 – 2020 and projected to fall by a further 0.25 $\mu g/m^3$ over the following 5 years.

Actions Plan measures and local factors that have improved air quality include:

6. The closure of Pebsham landfill site in 2008 contributed to reductions in particulate emissions on the A259. The exact impact on the reduction is difficult to quantify, however it's likely that the reduction in HGVs using Freshfields Lane will have reduced tail-pipe emissions in conjunction with reduced transfer of site dust from vehicles onto the A259.

7. The Hastings – Bexhill Link Road contribution to reductions in particulate emissions on the A259, are difficult to quantify but the following indicators show positive benefit to emissions reductions through:
   a. A259 traffic reductions of 22 % for period 2015 – 2016.
   b. A259 HGV reductions of 18% for period 2015 – 2016.

6.1 Recommendation:

Overall measurements of PM_{10} (and NO_2) within the AQMA have shown a significant decline in concentrations below the air quality objective levels and coupled with key local activities that have reduced local emissions it is recommended that Hastings Borough Council apply for the revocation of the Hastings PM_{10} AQMA.

Appendices

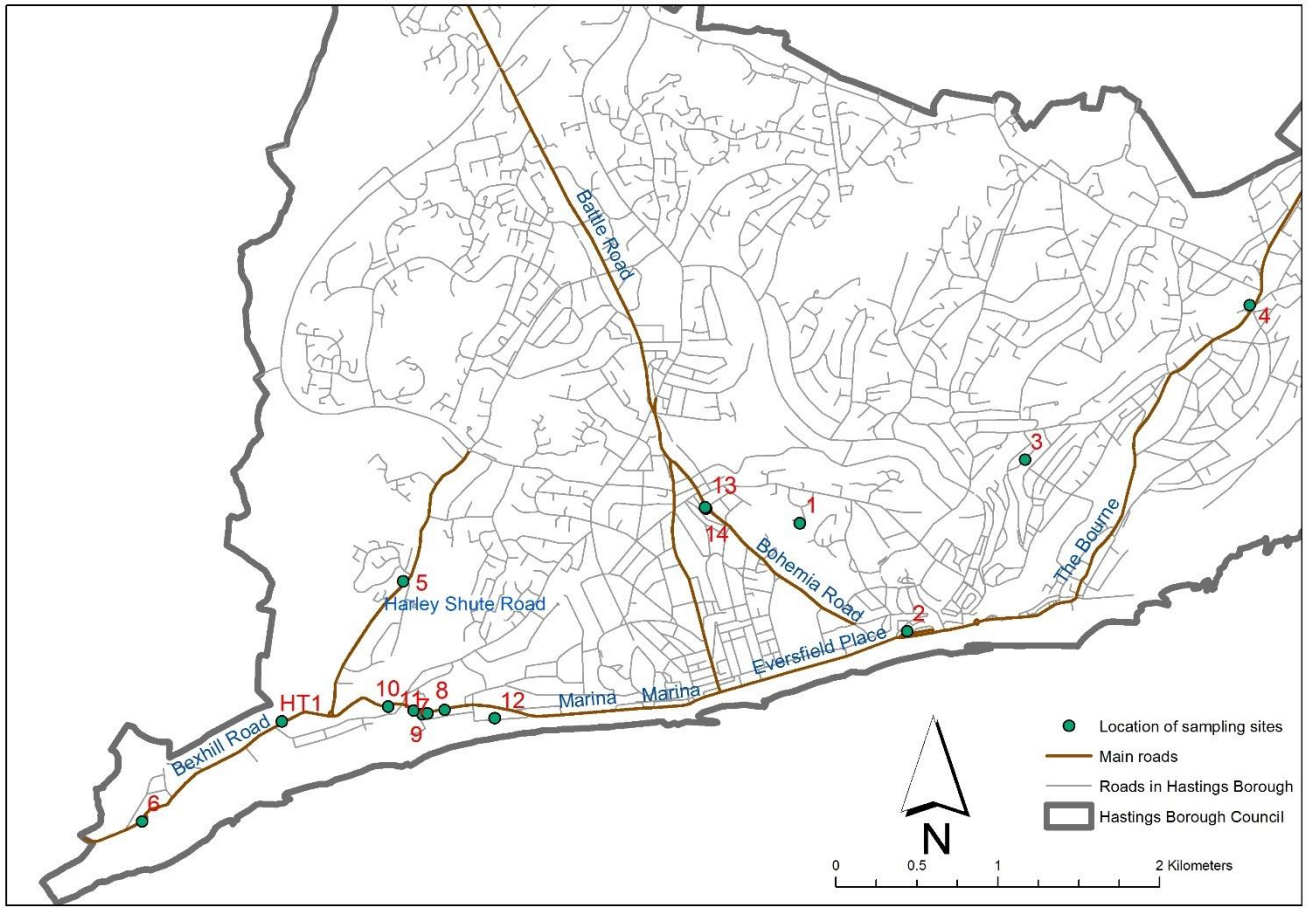
Appendix A - Summary of Air Quality Objectives in England

Table A 1:– Air Quality Objectives in England

Pollutant	Air Quality Objective[6]	
	Concentration	Measured as
Nitrogen Dioxide (NO_2)	200 µg/m^3 not to be exceeded more than 18 times a year	1-hour mean
	40 µg/m^3	Annual mean
Particulate Matter (PM_{10})	50 µg/m^3, not to be exceeded more than 35 times a year	24-hour mean
	40 µg/m^3	Annual mean
Sulphur Dioxide (SO_2)	350 µg/m^3, not to be exceeded more than 24 times a year	1-hour mean
	125 µg/m^3, not to be exceeded more than 3 times a year	24-hour mean
	266 µg/m^3, not to be exceeded more than 35 times a year	15-minute mean

[6] The units are in micrograms of pollutant per cubic metre of air (µg/m^3).

Appendix B – Map of Monitoring Locations



Site id	Site name
HT1	Bulverhythe
1	St Lukes 19 Barnfield Close
2	Carlisle Parade
3	Manor Road
4	Ore Church Old London Road
5	Harley Shute
6	Bexhill Road Boat
7	81 Bexhill Road
8	45 Bexhill Road
9	71 Bexhill Road
10	138 Bexhill Rd
11	Railway Bridge Bexhill Rd
12	West Marina Gardens
13	104 Bohemia Rd
14	116 Bohemia Road

Appendix C – Automatic and non-automatic motoring results

Table A 2: Annual average PM10 concentrations Bulverhythe since 2001

Year	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Annual Average (40 µg m^{-3})	33	37	38	27	28	30	27	26	28	24	24	22	21	19	23	19

Notes: Exceedances of the PM_{10} annual average objective (40µg/m^3) are shown in **bold.**

(1) data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

(2) If the period of valid data is less than 85%, the 90.4th percentile of 24-hour means is provided in brackets.

(3) 2016 provisional data, to be ratified.

Table A 3: Number of exceedances of daily mean objective of 50 µg m^{-3} and the associated data capture at Bulverhythe since 2001

Year	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Number of days above 50 µg m^{-3}	24	**52**	**62**	13	23	20	20	10	15	8	2	1	0	0	3	3

Notes: Exceedances of the PM_{10} 24-hour mean objective (50µg/m^3 not to be exceeded more than 35 times/year) are shown in **bold.**

(1) data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

(2) If the period of valid data is less than 85%, the 90.4th percentile of 24-hour means is provided in brackets.

(3) 2016 provisional data, to be ratified.

Table A 4:– 1-Hour Mean NO_2 Monitoring Results

Site ID	Site Name	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2015 (%) (2)	NO_2 1-Hour Means > 200µg/m^3 (3)				
						2011	2012	2013	2014	2015
HT1	Bulverhythe	Roadside	Automatic	94	94	0	0	0 (84)	0 (96)	0 (72)

Notes: Exceedances of the NO_2 1-hour mean objective (200µg/m^3 not to be exceeded more than 18 times/year) are shown in **bold.**

(1) data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

(2) If the period of valid data is less than 85%, the 99.8th percentile of 1-hour means is provided in brackets.

Table A 5 Annual Mean NO_2 Monitoring Results

Site ID	Site Name	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2015 (%) (2)	NO_2 Annual Mean Concentration ($\mu g/m^3$) (3)				
						2011	2012	2013	2014	2015
HT1	Bulverhyde	Roadside	CM	93.6	93.6	22	22	28	22	18.8
5	Harley Shute	Roadside	DT	79	79			37.4	40.4 (27.7[3])	31.9
6	Bexhill Road Boat	Roadside	DT	100	100			42.9 (28.2[3])	54.9 (33.9[3])	37.1

Notes: Exceedances of the NO_2 annual mean objective of $40\mu g/m^3$ are shown in **bold**.

NO_2 annual means exceeding $60\mu g/m^3$, indicating a potential exceedance of the NO_2 1-hour mean objective are shown in **bold and underlined.**

(1) data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

(2) data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

(3) The values within the brackets are distance corrected to the closest relevant receptor, thus those under 40 $\mu g\ m^{-3}$ are not in exceedance of the objective.

Appendix D – QA/QC of monitoring data

QA/QC of automatic monitoring data

The site is part of the Sussex Air Quality Network; hence the standards of QA/QC are similar to those of the government's AURN sites. The calibrations and filter change data are sent to the Environmental Research Group (ERG) at Kings College, London on a fortnightly basis.
The ERG collect data from the instruments on a daily basis, verifying the data against other monitoring stations in the south-east and ratifying it using the calibration information supplied. The Local Site Operations (LSO) duties are carried out by trained officers from the Council.

Gravimetric correction of particulate measurements

PM_{10} monitoring is undertaken at the automatic monitoring station using a Thermo TEOM 1400 PM_{10} monitor. This instrument measures the mass of particulate matter using a system which does not include the volatile component of particulates. To correct TEOM measurements for the loss of volatile components of particulate matter that occur due to the high sampling temperatures employed by this instrument, measurements are adjusted using the Volatile Correction Model (VCM) (http://www.volatile-correction-model.info/). King's College London uses the VCM correction is using local gravimetric measurement sites in Sussex and therefore all measurements presented are "gravimetric equivalent" PM_{10}.

Diffusion Tube Bias Adjustment Factors

Diffusion tubes may systematically under or over-read NO2 concentrations when compared to the reference chemiluminescence analyser. This is described as bias and can be corrected to improve the accuracy of the diffusion tube results, using a suitable bias adjustment factor. Hastings Borough Council's diffusion tubes are prepared and analysed by Gradko using the 20% TEA in water method. This laboratory takes part in the QA/QC Field Intercomparison, operated on behalf of DEFRA

Appendix E – Traffic data

Table A 6 : Traffic Count data for A259 (Bexhill Rd) 2005 - 2016

Year	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
AADT	31850	32780	32940	32940	31780	31380	29110	28970	30570	30930	30330	23650
Total change in year on year AADT (%)		3%	0%	0%	**-4%**	-1%	-7%	0%	6%	1%	-2%	**-22%**
HGV	1879	2032	2042	2042	1313	1296	1100	1095	1354	1370	1344	1097
HGV % of AADT	6%	6%	6%	6%	4%	4%	4%	4%	4%	4%	4%	5%
HGV change in year on year AADT (%)		8%	0%	0%	**-36%**	-1%	-15%	0%	24%	1%	-2%	**-18%**

Appendix F - Air Quality Management Area Revocation Order(example)

HASTINGS BOROUGH COUNCIL

ORDER 2017

ENVIRONMENT ACT 1995 PART IV SECTION 83(2)(b)

ORDER REVOKING AN AIR QUALITY MANAGEMENT AREA

Hastings Borough Council, in exercise of the powers conferred upon it by Section 83(2)(b) of the Environment Act 1995, HEREBY makes the following order:-

1. This Order shall revoke the area known as **Hastings Air Quality Management Area [AQMA 1]** for particles (PM10) around the designated area incorporating the A259, Bulverhythe, Hastings as shown in the attached (original) map.

2. The Order shall come into force on [DATE]

The Common Seal of
Hastings Borough Council
was hereto affixed
in the presence of:

Dated ……

The Gemini Building
Fermi Avenue
Harwell
Didcot
Oxfordshire
OX11 0QR
United Kingdom

t: +44 (0)1235 753000
e: enquiry@ricardo.com

ee.ricardo.com