

Report to: Overview and Scrutiny Committee (Regulatory, Compliance and Corporate Services)

Date of Meeting: 13 September 2016

Subject: Local Air Quality Management

Report of: Head of Regulation and Compliance

Wards Affected: All

Is this a Key Decision? No

Is it included in the Forward Plan? No

Exempt/Confidential No

Purpose/Summary

To provide an update report on Air Quality Management in Sefton

Recommendation(s)

The report be noted.

	<u>Corporate Objective</u>	<u>Positive Impact</u>	<u>Neutral Impact</u>	<u>Negative Impact</u>
1	Creating a Learning Community		X	
2	Jobs and Prosperity		X	
3	Environmental Sustainability	X		
4	Health and Well-Being	X		
5	Children and Young People	X		
6	Creating Safe Communities	X		
7	Creating Inclusive Communities		X	
8	Improving the Quality of Council Services and Strengthening Local Democracy		X	

Reasons for the Recommendation:

To update members current Air Quality Management issues within the Borough

What will it cost and how will it be financed?

(A) Revenue Costs

None

(B) Capital Costs

None

Implications:

The following implications of this proposal have been considered and where there are specific implications, these are set out below:

Legal	
None	
Human Resources	
None	
Equality	
1. No Equality Implication	<input checked="" type="checkbox"/>
2. Equality Implications identified and mitigated	<input type="checkbox"/>
3. Equality Implication identified and risk remains	<input type="checkbox"/>

Impact on Service Delivery:

None

What consultations have taken place on the proposals and when?

The Head of Corporate Resources has been consulted and has no comments on the report (FD 4251/16)

The Head of Regulation and Compliance has been consulted and any comments have been incorporated into this report (LD 3534/16)

Are there any other options available for consideration?

Implementation Date for the Decision

Following the expiry of the “call-in” period for the Minutes of the Cabinet/Cabinet Member Meeting

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Background Papers:

None

Background

1.1 The concept of Local Air Quality Management (LAQM) was introduced under the Environment Act 1995. Evidence has shown that certain atmospheric pollutants are linked to poor health. The Environment Act places a statutory duty on all Local Authorities to review and assess air quality in their areas at regular intervals. The Air Quality Regulations made under the Environment Act 1995 specify the pollutants that must be considered and sets standards and objectives for each of the pollutants, which are referred to as National Air Quality Standard (NAQS) Objectives.

The pollutants that have to be considered are:

Pollutant	Description	National Air Quality Standard Objective (NAQS)	Date to be Achieved
Benzene	An organic chemical compound emitted by some industrial processes and a constituent of petrol	5 µg/m³ (Annual Mean)	31.12.2010
1,3 Butadiene	A Hydrocarbon based gas released from car exhausts	2.25µg/m ³ (Annual Mean)	31.12.2003
Carbon Monoxide	An odourless colourless gas produced by incomplete combustion	10mg/m³ (8 hour mean)	31.12.2003
Lead	A heavy metal emitted by certain industrial processes	0.25µg/m³ (Annual Mean)	31.12.2008
Nitrogen Dioxide	A gas produced by internal combustion engines	200µg/m³ (1hr mean) not to exceeded more than 18 times per annum 40µg/m³ (Annual mean)	31.12.2005
Particulate Matter PM ₁₀	Particulates less than 10µm in diameter.	50µg/m³ (24hr mean) not to be exceeded	31.12.2004

		<p>more than 35 times per annum</p> <p>40µg/m³ (Annual mean)</p>	
Sulphur dioxide	A gas which can be produced when burning fossil fuel	<p>266µg/m³ (15 min mean) Not to be exceeded more than 35 times a year</p> <p>350µg/m³ (1hr mean) Not to be exceeded more than 24 times per year</p> <p>125µg/m³ (24hr mean) Not to be exceeded more than 3 times a year</p>	31.12.2005

- 1.2 The review and assessment process has to take place every 3 years and if this review and assessment determines that any of the health based air quality objectives detailed above are unlikely to be met, the Local Authority has to identify Air Quality Management Area(s) (AQMA) for that defined area and produce an action plan to work towards compliance with the objective(s). In intervening years a progress report is also prepared.
- 1.3 The Review and Assessment is a 2 stage process. Initially an Updating and Screening Assessment (USA) is undertaken. This is intended to identify any significant changes that have occurred since the previous rounds of Review and Assessment were completed. The assessment includes a review of all new monitoring data, modelling, any new or changed sources and any other changes that might affect air quality, including new roads or major developments like the port expansion or the Thornton Link road.
- 1.4 If the updating and Screening Assessment identifies a risk of failing to meet the objectives then a Detailed Assessment has to be carried out. If this detailed assessment confirms that an exceedence is likely, an AQMA must be identified. An action plan must also be developed to work towards compliance with the relevant NAQS objective(s).
- 1.5 Sefton has undertaken a number of Review and Assessments since the Environment Act placed this duty on Local Authorities. Copies of these reports can found be on Sefton's Breathing space website along with air pollution monitoring data. <http://breathingspace.sefton.gov.uk> . As part of these previous assessments it has been determined that for the following pollutants, Benzene, 1,3 Butadiene, Carbon Monoxide, Lead and Sulphur Dioxide, the NAQS objectives will **not** be exceeded in Sefton and as such, no AQMAs

have been declared for these pollutants. These pollutants will however be kept under regular review as part of the Review and Assessment process.

- 1.6 Through Detailed Assessments, however, a number of locations in Sefton have been identified where historically NAQS objectives for Particulates (PM₁₀) and Nitrogen Dioxide (NO₂) will not or are unlikely to be met. AQMA's have been identified in these locations which are discussed in more detail below.

Air Quality Management Areas (AQMAs)

- 2.1 As part of the on-going air quality assessment process the boundaries of 5 AQMAs have been identified across the Borough where NAQS objectives have not been met and in some cases continue not to be met.

AQMA 1 (now de-declared)	A565 Crosby Road North, Waterloo
AQMA 2	A5036 Princess Way and Crosby Road South Junction, Seaforth.
AQMA 3	A5058 Millers Bridge and Derby Road Junction, Bootle.
AQMA 4	A565 Crosby Road North and South Road Junction, Waterloo
AQMA 5	B5422 Hawthorne Road and Church Road Junction, Litherland.

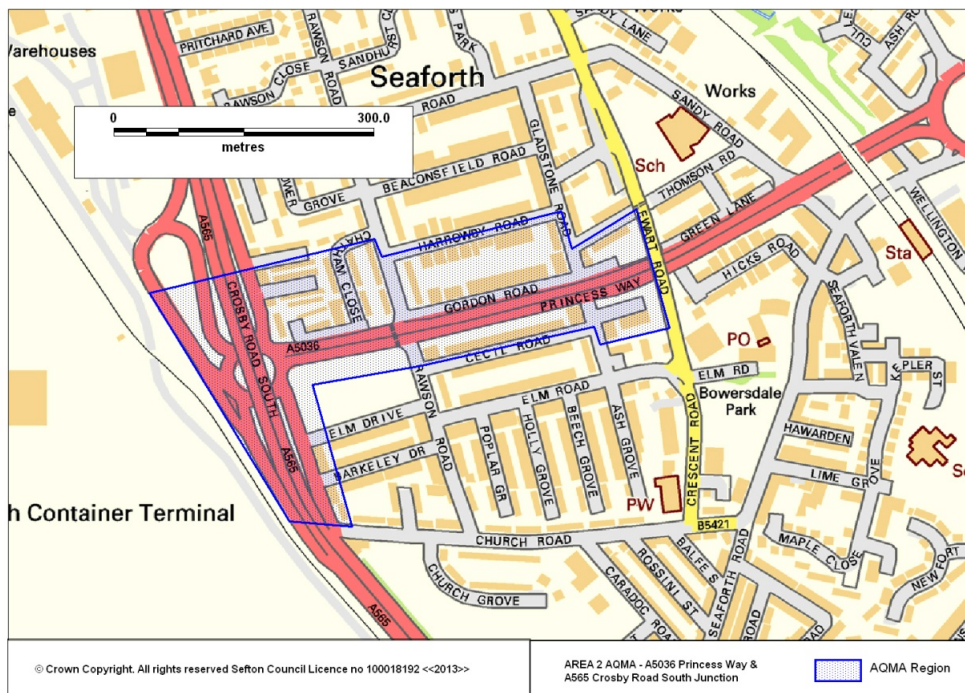
AQMA 1- Crosby Road North, Waterloo.



- 2.2 AQMA 1 was identified in 2009 for NAQS objective exceedences for PM₁₀. The further assessment confirmed the exact boundaries of the AQMA. Since then significant work has been undertaken to reduce particulate levels in the area. A number of measures have been implemented as part of the Action Plan including the development of a Route Management Strategy Action Plan which has improved traffic flows in the area. As a result of these measures, the NAQS objective has consistently been met at this AQMA for the last 7

years as such this AQMA has been de-declared and levels of PM₁₀ now consistently comply with the particulate standard.

AQMA 2-Princess Way, Seaforth.

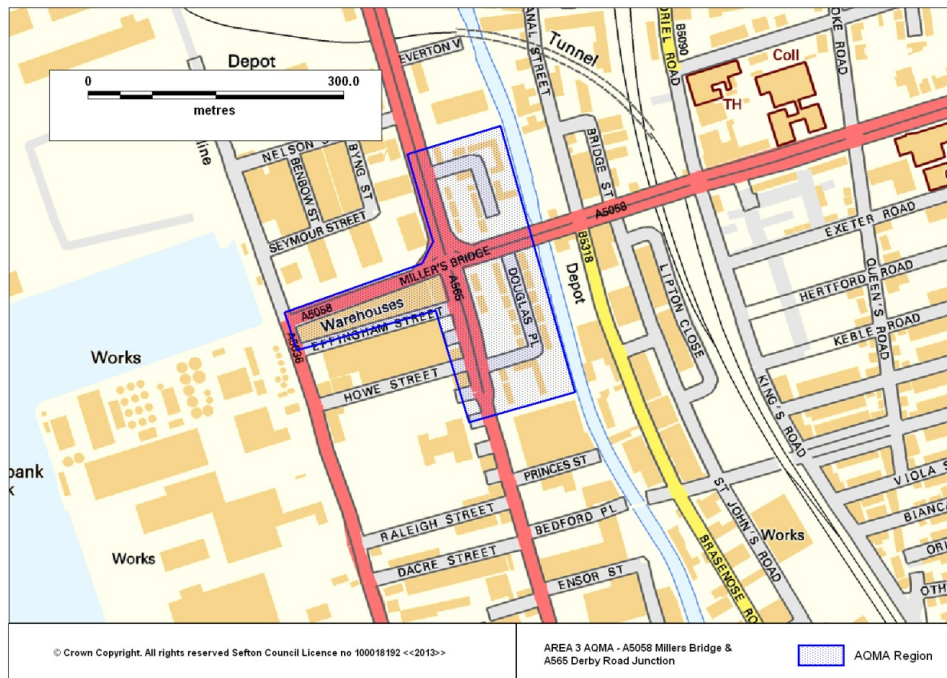


2.3 AQMA 2 was identified in 2009 for NO₂ exceedences. The boundaries of the AQMA were defined as part of the Further Assessment process. The main source of NO₂ in this AQMA is considered to be emissions from HGV's. Work is almost complete on the deep water berth at the Port of Liverpool, which once in operation will undoubtedly increase the numbers of HGV's using the A5036 and surrounding network. A major highways improvement intervention will be required to accommodate the increase in road traffic as a result of the port expansion. Action plans have been developed to look at options to reduce the levels of NO₂ in this area, however, compliance with the NAQS objective in the short term is unlikely as the improvements predicted as a result of the site specific measures currently in place (the Eco Stars fleet recognition scheme and Port Booking system) are unlikely to have enough of an impact to enable compliance.

2.4 To try and address the significant challenge of reducing NO₂ in this area, the Department has recently been successful in obtaining DEFRA grant funding to employ consultants to undertake a feasibility study into the use of alternative fuels for HGV's. This may encourage fleet operators to use alternative fuelled vehicles which emit less NO₂. The results and outcome of this study are discussed later in the report. Highways England are currently looking at options to improve the highway network as a result of the port expansion and have appointed Atkins Consultants to assess the options. The Department is also undertaking in house air quality modelling to assess the air

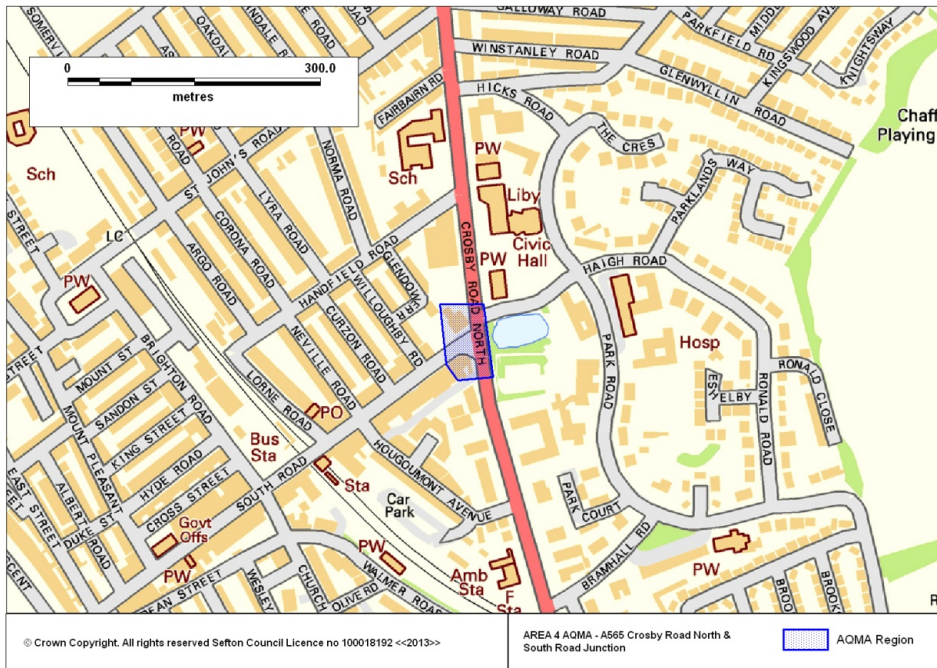
quality impact of the port expansion on the A5036. This work is now almost complete and in the process of being externally verified. Once this verification has been completed air quality modelling can be undertaken to assess the potential effects the port expansion will have on air quality around the A5036. This will also allow us to challenge and critically review options put forward by Highways England.

AQMA 3 Millers Bridge



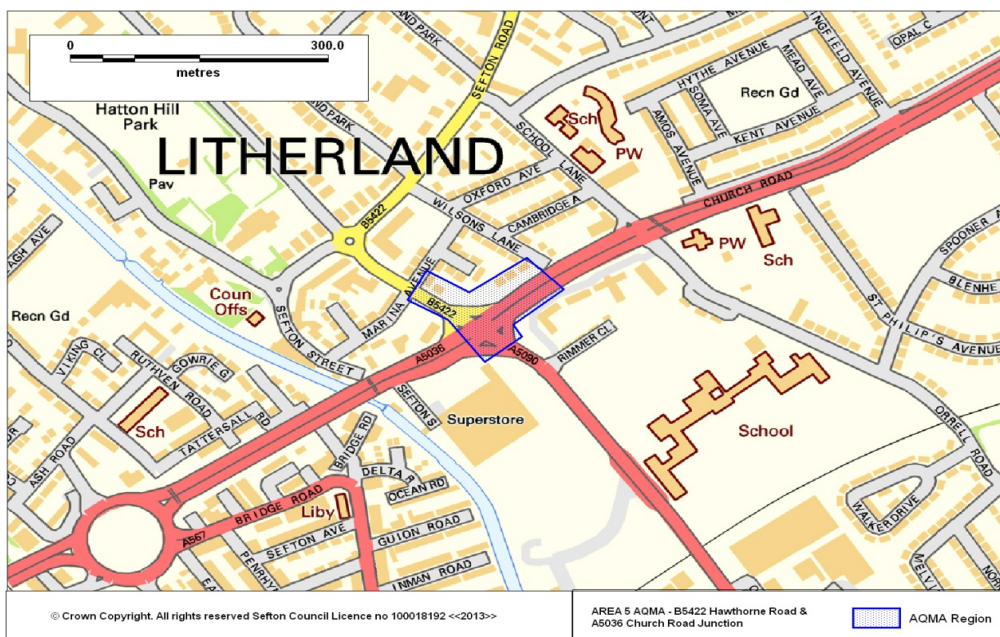
- 2.5 AQMA 3 was identified in 2009 for exceedences of the PM₁₀ and NO₂ NAQS objectives. The main contributors to the emissions in this area were HGV's and industrial processes on the dock estate. A number of successful measures have been implemented, historically, in this area as part of the action plan to reduce emissions. Intensive road and footpath washing has been undertaken to reduce the amount of particulates being re-suspended. A HGV hurry call system has also been introduced which gives priority to HGV's heading up Millers Bridge, reducing the need for stopping at the traffic lights thus reducing emissions.
- 2.6 Officers from the Department continually work with operators and the Environment Agency to ensure industrial emissions are monitored and controlled effectively. The measures described above are having consistent positive effects on lowering emissions in the area.
- 2.7 As a result of these measures the NAQS objective for PM₁₀ has consistently been met for the last 7 years and as such could be de-declared. However this will be kept under review as the port expands in the future. With regard to NO₂ the results of diffusion tube monitoring still show some exceedences of the annual NAQS objective in this AQMA.

AQMA 4 Crosby Road North, South Road Waterloo



2.8 AQMA 4 was identified in 2012 for exceedences of the NO₂ NAQS objective. As part the Action Plan to address this exceedence, improvements to the South Road and Haigh Road junction are currently being implemented to improve traffic flow. The junction improvement scheme is nearing completion, and once complete the results of the works will be assessed to determine compliance with the NAQS objective. It is expected that these measures will reduce levels of NO₂ to below the NAQS objectives.

AQMA 5 Hawthorne Road, Church Road Litherland



2.9 AQMA 5 was identified in 2012 for NO₂ NAQS objective exceedences. The main source of the emissions at this location is road traffic. In 2013 and 2015 this AQMA showed borderline compliance with the annual NAQS objective for NO₂. However as with AQMA 2, this site may be affected by the increased emissions due to HGV traffic as a result of the port expansion. Action plans to address this exceedence will need to be developed as and when the decision on what highways option is to be implemented.

Monitoring

Real Time Automatic Monitoring Stations

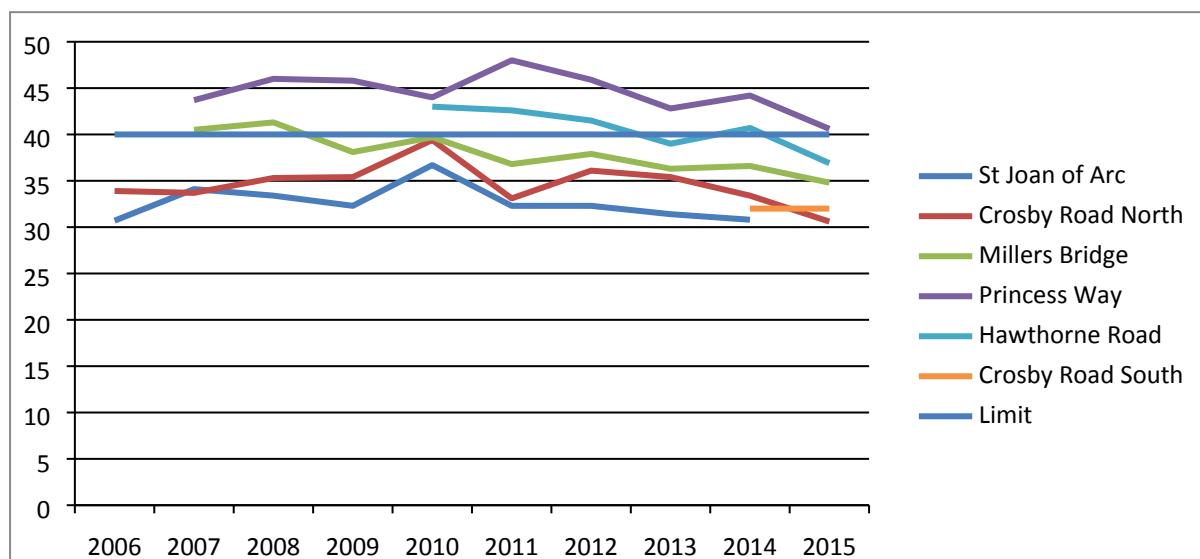
3.1 To assist and provide relevant data for the ongoing Air Quality Assessment process, Sefton currently monitors air quality in 5 locations in the South of the Borough measuring particulates (PM₁₀), Nitrogen Dioxide (NO₂) and Sulphur Dioxide (SO₂) using sophisticated, real time automatic monitors. They are located in areas that represent relevant public exposure and are either in areas identified as AQMA's or areas where further data is required to support the ongoing review process. The monitors are constantly recording levels of these pollutants to enable direct comparison with hourly, daily and annual mean NAQS objectives detailed above. The location of all 5 monitors is described in the table on the next page.

Monitor Location	Justification for Location	Pollutants Monitored
Waterloo Primary School, Crosby Road North, Waterloo.	Within AQMA1 Crosby Road North. Proximity to Road/Sensitive Receptor	PM ₁₀ NO ₂
Hawthorne Road opposite KFC, Litherland	Within AQMA 5 Church Road Junction- Proximity to Road Junction/Sensitive Receptor	NO ₂
Lathom Close, Seaforth	Within AQMA 2. Proximity to Road/Docks/Sensitive Receptor	PM ₁₀ NO ₂
Millers Bridge, Bootle	Within AQMA 3. Proximity to Road Junction/ Docks and Sensitive Receptor.	PM ₁₀ NO ₂
A565, Crosby Road South previously located at St Joan of Arc School	Proximity to Road /Docks and Sensitive receptor.	PM ₁₀ NO ₂ SO ₂

Diffusion Tubes

3.2 In addition to the real time monitors, Sefton measures monthly NO₂ levels at approximately 100 sites across the Borough using diffusion tubes.

Summary of NO₂ levels at all sites

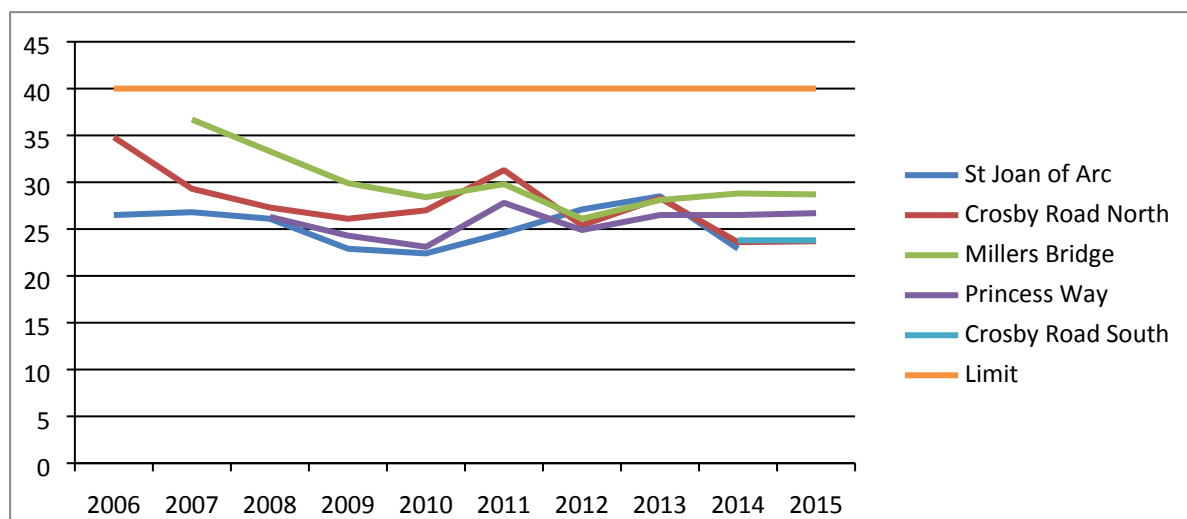


4.1 Overall levels of NO₂ have been showing a gradual decline over the last few years. Compliance with the NAQS objectives has been met at all automatic monitoring sites in 2015 when assessed at the nearest residential premises, however monitoring at all sites will continue so that the impact of the port expansion can be assessed.

PM₁₀ Annual Mean 2006 - 2015

Location	Annual Mean PM ₁₀ Concentrations (µg/m ³) Limit 40ug/m ³ VCM shown in brackets where applicable and where valid FDMS was available									
	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
St Joan of Arc School, Bootle.	26.5	26.8	26.1 ¹	22.9 ²	22.4	24.6	27.1	28.5	22.9	27.1 ³
Crosby Road North, Waterloo.	34.8	29.3	27.3	26.1	27.0	31.3	25.4*	28.3	23.6	23.7
Millers Bridge, Bootle.	n/a	36.7	33.3	29.9	28.4	29.8	26.1*	28.1	28.8	28.7
Princess Way, Seaforth.	n/a	n/a	26.3	24.3	23.1	27.8	24.9	26.5	26.5	26.7
Crosby Road South, Seaforth.	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	23.8 ⁴ *

Summary of PM₁₀ levels across all sites



PM₁₀ Daily Mean 2006 – 2015

Location	Number of Exceedences of PM ₁₀ Daily Mean Objective 50 µg/m ³ Limit 35 exceedences									
	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
St Joan of Arc School, Bootle.	9	9	5 ¹	0 ²	1	4	5	18	3	5
Crosby Road North, Waterloo.	46	21	14	10	16	31	18*	17	8	4
Millers Bridge, Bootle.	n/a	46	33	11	20	25	13*	17	14	15
Princess Way, Seaforth.	n/a	n/a	15	7	6	20	15	12	12	14
Crosby Road South, Seaforth.	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	5

¹Jan – Sept, ² March – Dec. * <90% DC.

4.2 All areas are now consistently compliant with the PM₁₀ NAQS objectives with annual levels more or less consistent for the last 2 years. The number of daily exceedences is also consistently below the standard of 35 exceedences per year. Monitoring of PM₁₀ will however continue to assess the impact the port expansion may have on particulate emissions.

4.3 See appendix 1 for the results from the NO₂ diffusion tube monitoring. Results show that only one tube when corrected for fall off due to distance exceeds the annual standard for NO₂. This tube is located at Derby Road.

Recent Developments/Current issues

5.1 Emissions from heavy goods vehicles (HGV's) in 3 of Sefton's AQMA's at Millers Bridge (A5056/A565), Princess Way (A5036) and Hawthorne Road/Church Road (A5036) have been identified as a significant contributor to air pollution levels in these locations.

5.2 The port of Liverpool is undergoing a major expansion, including the construction of a deepwater river berth that will allow post panamax container ships to dock. This will increase the number of containers coming into the port significantly. A Port Access study commissioned by Sefton concluded that the number of container carrying HGV's using the A5036 may double by 2030 and the road in its current state will reach capacity by 2020.

5.3 Detailed Air Quality Action plans are in place in Sefton to try to reduce levels of air pollution (specifically NO₂ and PM₁₀) in our AQMA's. The reduction of pollution levels in the AQMA's is a challenging task already, however an increase in the HGV movements predicted could have significant adverse impacts on air quality in Sefton possibly extending the existing AQMA's or the declaration of new ones.

5.4 Options for reducing the emissions and improving air quality along the A5036 corridor and surrounding areas have been examined during the development of the air quality action plans for the individual AQMA's. A number of measures have been already implemented successfully as part of the action plans as discussed above, however, options for reducing levels of air pollution in these areas further are extremely limited and as such alternative solutions are being considered. One possible option to reduce levels of air pollution in Sefton is to encourage the use of alternative fuelled HGV's or lower emission vehicles which emit less pollution.

5.5 Officers in the Environmental Health Commercial team were successful in obtaining a DEFRA Air Quality grant of £40,000 to fund a study to look into the options available to encourage the uptake of alternative fuelled vehicles and lower emission vehicles.

5.6 After a competitive tendering process consultants Element Energy were awarded the contract to undertake the study. The study considered the possible uptake and emissions benefits of a range of alternative HGV technologies within Sefton and the Liverpool City Region. Potential demand and key barriers to uptake of these technologies was identified through consultation with local fleet operators. The consultation also informed a detailed siting exercise for potential future gas refuelling infrastructure, enabling the assessment of the business case for gas refuelling stations in the Liverpool City Region. The impact of the new Euro 6 emission standard for diesel vehicles was also considered.

Findings from Element Energy Study

5.7 One of the major initial findings identified in the Element Energy study is that the new Euro 6 Vehicle emission standard for diesel HGV's has substantially reduced the levels of PM₁₀ and NO₂ allowed to be emitted from all new HGV's

compared to older Euro standard vehicles. This will result in significant real world reductions in HGV NO₂ and PM₁₀ emissions, which will be achieved over the next 5-15 years through normal fleet renewal. It is not clear however whether this alone will ensure air pollution within Sefton's AQMA's will be reduced below national standards and how long in reality this will take. To achieve compliance with NAQS objectives it may well be that the uptake of cleaner vehicles has to be speeded up through alternative measures.

5.8 Although the intention of the study was to consider the benefits of Alternative fuelled vehicles, It is now unclear at this stage whether Alternative fuelled vehicles (eg gas powered) will bring additional benefits in terms of air pollution reductions over and above those which will be achieved by compliant Euro 6 diesel powered vehicles. A National study is underway to assess this with the results being used to inform Sefton of the appropriate direction in respect of whether to encourage further the uptake of Alternative fuelled vehicles or encourage the update of Euro 6 diesel HGV's

5.9 As part of the original brief possible locations for gas refuelling infrastructure were considered in terms of their convenience for local fleets. Following consultation, 4 potential gas refuelling sites were identified that could potentially be used by vehicle fleets operating in the LCR. Of the four potential sites, a station at OMEGA Warrington would be most likely to succeed, However, given the current level of uncertainty around the air quality emissions benefits of new gas vehicles, compared to diesel equivalents, the recommended approach for Sefton and LCR is to wait until clear evidence on these issues becomes available before taking specific actions to support gas infrastructure deployment.

Proposed actions for Sefton

5.10 A large number of possible actions have been proposed within the report, however, 4 Priority recommendations have been identified that should be considered in the first instance.

- Set up a working group to review air quality for Sefton and the LCR and develop and oversee overarching action plan(s) if required.
- Utilise the Merseyside Atmospheric Emissions Inventory or similar to model future emission levels in Sefton and the LCR, to inform the need for mitigating actions
- Conduct a feasibility study for Clean Air Zones (if evidence from emissions modelling suggests that accelerated uptake of Euro 6 HDVs is required in the LCR)
- Apply for OLEV gas refuelling infrastructure funding if and when it is released. ((if evidence from emissions modelling suggests that further uptake of alternative fuelled vehicles is required in the LCR)

5.11 The setting up of a working group is now being progressed . It is likely that the setting up of such a group will require a significant input from those organisations involved, however given the potential health impacts of poor air quality on residents of Sefton and the wider LCR it is considered that this should be made a priority. The

group will then consider in detail the additional actions identified above and progress these as appropriate.

Local Authorities new role in relation to PM_{2.5}

5.12 DEFRA have been reviewing the LAQM system since 2013 and they reported recently measures to improve and streamline the regime along with changes to LA's roles and responsibilities. Perhaps one of the most significant changes is in relation to LA's role in respect of particulate matter less than 2.5 microns in diameter (PM_{2.5}).

5.13 These particles have been identified as a particular health concern as they have the potential to penetrate beyond the body's natural defences into the lungs and bloodstream etc. Air pollution including particulate matter affects mortality from cardiovascular and respiratory conditions, including lung cancer. In its report on 'The Mortality Effects of Long-Term Exposure to Particulate Air Pollution in the United Kingdom', published in 2010, the Committee on the Medical Effects of Air Pollutants (COMEAP) estimated the mortality burden of existing levels of air pollution on the population of the UK as being equivalent to 29,000 deaths and an associated loss to the population of 340,000 life-years.

5.14 In view of these concerns specifically with regard to PM_{2.5} a new Public Health Outcomes Framework (PHOF) indicator has been developed as detailed below:-

PHOF Indicator 3.1 Health Protection-Fraction of all-cause adult mortality attributable to anthropogenic particulate air pollution (measured as fine particulate matter, PM_{2.5})

5.15 This indicator is intended to enable Directors of Public Health to prioritise action on air quality in their local area to help reduce the health burden from air pollution. To help with this a PM_{2.5} role for Local Authority Air Quality teams has been proposed so that alongside measures to tackle other pollutants, they also consider action if necessary to address PM_{2.5} issues in their area, aligning their interests with those of Public Health Professionals.

LA's Role

5.16 LA's are now expected to work towards reducing emissions and concentrations of PM_{2.5} in their local area as far as is reasonably practicable. Unfortunately the guidance does not prescribe exactly what the Local Authority role should be; it is for the Local Authority in consultation with its public health officials and others to consider how it wishes to define this role. Local Authorities will then be expected to set out in their annual reports how they have chosen to fulfil their role to work towards reducing PM_{2.5} and any actions they are taking or will take, including any linkages to the PHOF. Decisions should be based on local need and priorities.

Options for Sefton with Regard to PM_{2.5}

5.17 LA's have never had a role in regard to PM_{2.5} and as such Sefton has no recent data on PM_{2.5} levels in the Borough. As part of our new role we will be expected to set out in our annual reports how we have chosen to fulfil our obligation to work towards reducing PM_{2.5}.

Ratio of PM_{2.5} to PM₁₀

5.18 One method of estimating PM_{2.5} levels in Sefton would be to use a ratio of PM_{2.5} to PM₁₀ to calculate PM_{2.5} levels at locations where PM₁₀ is monitored. Contained in the proposed guidance is a standard ratio of 0.7 which can be potentially used to convert known PM₁₀ levels to give approximate levels of PM_{2.5}. This method however may not give accurate results. The table below indicates what this crude analysis would mean for Sefton's most recent annual results.

Monitor Location	PM ₁₀ 2015	PM _{2.5} 2015 based on ratio
Waterloo Primary School, Crosby Road North, Waterloo.	24 ug/m ³	17 ug/m ³
Lathom Close, Seaforth	27 ug/m ³	19 ug/m ³
Millers Bridge, Bootle	29 ug/m ³	20 ug/m ³
Crosby Road South	24 ug/m ³	17 ug/m ³

Modelling

5.19 Levels of PM_{2.5} could also be modelled in the Borough. This is something that would require additional resources to undertake as this is a specialist area of work which could not be accommodated using existing staff resources.

Monitoring

5.20 The section is currently looking into the possibility of Purchasing a new type approved PM_{2.5} monitor for location in an existing station or in a new station. The cost of a type approved PM_{2.5} monitor including set up costs and maintenance would be in the region of £30000 with a £5000 increase in annual maintenance and QA/QC costs. Funding sources for this are currently being explored

5.21 Given the concern about air pollution, in particular particulates, that exists in the community and evidence of higher levels of respiratory and heart disease in the south of the Borough it is considered that there is significant value in measuring PM_{2.5} to inform and support our Public Health and Air Quality plans and policies.

Conclusions

6.1 NAQS Air Quality Objectives are complied with across the majority of Sefton. Review and Assessment and air pollution monitoring have identified areas where NAQS Objectives will not be met and Action Plans are in place to work towards compliance in these areas. Action plan measures have shown significant success and levels of pollution have reduced across the borough with levels of PM₁₀ at all monitoring locations below the NAQS objectives which resulted in the de-declaration of AQMA 1.

6.2 There are however areas where there are major potential challenges to air quality. Port expansion and the associated increase in HGVs may lead to an increase in emissions that will affect air quality in the AQMAs and other areas around the A5036, A565 and A5058. The Element Energy study has identified that levels of pollutants emitted from new Euro VI Heavy goods are significantly less than older euro standards and as such, as vehicles are replaced through fleet renewal, levels of

particulates and nitrogen dioxide will also reduce significantly in heavy traffic areas. It is not clear, however, whether this alone will reduce levels of NO₂ and PM₁₀ to below the NAQS objectives within Sefton's existing AQMAs.

6.3 Officers from within the Environmental Health Commercial Team are now in the process of implementing a number of recommendations (as detailed in section 5) made by Element Energy including the setting up of a working group to consider AQ in the Liverpool City Region and produce overarching action plans to ensure compliance with NAQS objectives across the region. One of the group's specific tasks will be to consider whether accelerated uptake of Euro VI vehicles will be required to achieve compliance with NAQS objectives for example through the use of Clean Air Zones. Monitoring of levels of PM_{2.5} is also being considered and should funding be secured a PM_{2.5} monitor will be purchased to assist in Sefton's review and assessment of this particular pollutant.

6.4 Further update reports will be brought to committee in due course.

Appendix 1 – Diffusion Tube results.

Site ID	Site Location	Easting	Northing	2008	2009	2010	2011	2012	2013	2014	2015
NH	Scarbrick New Road, Southport	334379	416414	32	29	33	29	n/a	n/a	n/a	n/a
NL	Chapel Street, Southport	333654	417148	26	n/a	n/a	n/a	n/a	n/a	n/a	n/a
NM	Sussex Road, Southport	334808	417015	31	28	30	n/a	n/a	n/a	n/a	n/a
NW	Gladstone Road/Gordon Road, Seaforth	332978	397021	39	36	***	36	36	33	33	30
NAG	Lydiate Lane, Thornton	334039	400808	25	24	27	23	24	21	21	18
NAH	Oxford Road, Waterloo	331528	398411	31	28	32	n/a	n/a	n/a	n/a	n/a
NAJ	Southport Road/Hatfield Road, Bootle	335221	395258	36	33	35	32	n/a	n/a	n/a	n/a
NAM	Sycamore Road, Crosby	332152	398648	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
NAN	Strand Road, Bootle	333399	395251	38	34	34	33	34	34	33	30
NAO	Halidon Court, Bootle	333375	395866	33	30	32	30	n/a	n/a	n/a	n/a
NAS	Level Crossing, Duke Street, Southport	333542	416394	18	n/a	n/a	n/a	n/a	n/a	n/a	n/a
NAT	Hawthorne Road, Bootle	334790	395240	41	36	39	36	36	n/a	n/a	n/a
NAU	Sussex Street/Hawthorne Road, Bootle	334791	395755	30	28	33	26	n/a	n/a	n/a	n/a
NAV	Suffolk Street/Hawthorne Road, Bootle	334764	395840	31	29	31	28	n/a	n/a	n/a	n/a
NAW	Balliol House, Bootle	334459	394781	42	39	42	35	37	37	35	33
NAX	Northway, Maghull	337439	401350	***	25	27	n/a	n/a	n/a	n/a	n/a
NBB	Eaton Avenue, Seaforth	333510	397184	37	34	37	34	34	33	31	28
NBC	Washington Parade, Bootle	334144	395396	***	29	33	n/a	n/a	n/a	n/a	n/a
NBE	Gorsey Lane, Netherton	334074	399090	34	31	35	n/a	n/a	n/a	n/a	n/a
NBF	Bailey Drive, Bootle	335377	397233	37	36	34	32	n/a	n/a	n/a	n/a
NBG	Westway, Maghull	337513	402583	36	31	34	32	32	29	n/a	n/a
NBH	Clayfield Close, Bootle	334910	394952	33	31	33	n/a	n/a	n/a	n/a	n/a
NBL	Litherland Road/Marsh Lane, Bootle	334432	395820	39	33	35	33	33	31	29	29
NBM	Millers Bridge, Bootle	333785	394594	51	45	46	46	45	45	44	41
NBN	Boundary Road, Netherton	335003	398232	34	35	34	n/a	n/a	n/a	n/a	n/a
NBO	Douglas Place, Bootle	333828	394457	35	32	37	34	34	32	30	29
NBP	College View, Bootle	334151	394679	38	33	35	n/a	n/a	n/a	n/a	n/a
NBQ	Douglas Place/Millers Bridge, Bootle	333834	394570	***	35	37	32	35	33	32	30
NBR	Derby Road, Bootle	333751	394553	63	59	60	56	58	56	54	53
NBS	Derby Road, Bootle	333757	394622	49	44	51	46	48	43	40	39
NBT	Hatfield Road, Bootle	335205	395242	31	28	30	28	n/a	n/a	n/a	n/a
NBU	Hougoumont Avenue/South Road, Waterloo	332083	398113	34	31	35	28	31	29	26	25
NBV	Quarry Road, Thornton	333386	400851	36	37	43	35	37	35	33	31
NBW	Crosby Road South/Riversdale Road, Seaforth	332599	397021	38	36	38	36	36	34	33	31
NBY	Lytton Grove, Seaforth	333017	396995	57	53	56	n/a	n/a	n/a	n/a	n/a
NBZ	Great George's Road, Waterloo	332286	397847	35	32	36	32	n/a	n/a	n/a	n/a
NCA	Liverpool Road North, Lydiate	337337	403098	34	29	33	n/a	n/a	n/a	n/a	n/a
NCB	Oundle Drive, Old Roan	337104	399384	33	33	35	32	n/a	n/a	n/a	n/a
NCC	Oundle Drive, Old Roan	337140	399369	30	27	31	28	n/a	n/a	n/a	n/a
NCD	Bishop David Sheppard School, Southport	336468	417493	17	n/a	n/a	n/a	n/a	n/a	n/a	n/a
NCF	Hereford Drive, Bootle	335844	397953	27	26	26	n/a	n/a	n/a	n/a	n/a
NCG	Bridle Road, Bootle	336110	397859	38	34	37	30	30	n/a	n/a	n/a
NCH	Farriers Way, Bootle	335683	397816	35	25	28	n/a	n/a	n/a	n/a	n/a
NCI	Hawthorne Road, Bootle	333821	397512	47	45	49	49	48	42	42	37
NCJ	South Road, Waterloo	332204	398230	51	46	50	43	46	42	41	38
NCK	The Northern Road, Crosby	332328	400120	33	32	36	34	n/a	n/a	n/a	n/a
NCL	Farriers Way, Bootle	335735	397677	n/a	27	30	n/a	n/a	n/a	n/a	n/a
NCM	Molyneaux Road, Waterloo	332188	398661	n/a	33	34	30	32	n/a	n/a	n/a

NCN	Manor Close, Bootle	335279	394948	n/a	30	37	31	32	n/a	n/a	n/a
NCR	Parker Avenue, Seaforth	332507	397330	n/a	31	38	36	36	33	33	30
NCS	Willoughby Road, Waterloo	332142	398186	n/a	25	28	26	25	24	24	20
NCT	Coronation Road, Crosby	331510	399458	n/a	25	30	25	25	n/a	n/a	n/a
NCU	Sefton Street, Litherland	333711	397422	n/a	33	35	36	35	35	33	26
NCV	South Road Waterloo	332188	398218	n/a	27	30	28	31	26	28	22
NCW	Ash Road, Seaforth	333376	397273	n/a	***	35	35	30	n/a	n/a	n/a
NCX	Southport Road, Lydiate	337323	403226	n/a	***	31	n/a	n/a	n/a	n/a	n/a
NCY	Lytton Grove, Seaforth	332976	396977	n/a	n/a	***	33	31	32	31	26
NCZ	Pleasant Street, Bootle	333674	394904	n/a	n/a	***	41	37	37	38	34
NDA	South Road, Waterloo	333203	398227	n/a	n/a	***	47	n/a	n/a	n/a	n/a
NDC	Marsh Lane, Bootle	334328	395797	n/a	n/a	n/a	38	38	38	36	33
NDD	Hawthorne Road, Litherland	333773	397535	n/a	n/a	n/a	48	42	43	44	38
NDE	Wilson's Lane, Litherland	333913	397574	n/a	n/a	n/a	32	30	30	29	26
NDF	Church Road flats. Litherland	333909	397497	n/a	n/a	n/a	34	34	31	30	27
NDG	Marina Avenue, Litherland	333759	397460	n/a	n/a	n/a	27	31	27	30	24
NDH	South Road, Waterloo	332191	398194	n/a	n/a	n/a	38	39	35	36	32
NDI	Crosby Road North, Waterloo	332205	398190	n/a	n/a	n/a	43	44	41	41	34
NDJ	The Crescent, Thornton	333372	400810	n/a	n/a	n/a	31	35	n/a	n/a	n/a
NDK	Derby Road, Southport	334198	417144	n/a	n/a	n/a	22	22	n/a	n/a	n/a
NDL	Haig Avenue, Southport	335741	416315	n/a	n/a	n/a	21	23	n/a	n/a	n/a
NDM	Chapel Terrace, Bootle	333656	395005	n/a	n/a	n/a	n/a	31	33	35	31
NDN	Queens Road, Bootle	334225	394710	n/a	n/a	n/a	n/a	32	32	34	29
NDO	Hawthorne Road/ Linacre Lane, Bootle	334647	396388	n/a	n/a	n/a	n/a	42	44	47	38
NDP	Gordon Road/ Rawson Road, Bootle	332786	396975	n/a	n/a	n/a	n/a	39	35	39	33
NDQ	Rawson Road, Bootle	332788	396932	n/a	n/a	n/a	n/a	38	36	34	30
NDR	Crosby Road North, Waterloo	332216	398236	n/a	n/a	n/a	n/a	41	40	39	35
NDS	South Road, Waterloo	332142	398176	n/a	n/a	n/a	n/a	36	34	35	30
NDT	Glendower Road, Waterloo	332115	398241	n/a	n/a	n/a	n/a	23	23	22	20
NDU	Liverpool Road/ Kingsway, Waterloo	332196	398788	n/a	n/a	n/a	n/a	39	38	38	33
NDV	Moor Lane, Crosby	332327	400168	n/a	n/a	n/a	n/a	44	43	38	36
NDW	Church Road/ Kirkstone Road North	334577	397923	n/a	n/a	n/a	n/a	37	37	39	31
NDX	Merton Road, Bootle	334734	395138	n/a	n/a	n/a	n/a	35	37	36	33
NDY	Hougoumont Avenue/Crosby Road North	332248	398008	n/a	n/a	n/a	n/a	28	26	28	22
NDZ	Bailey Drive, Bootle	335394	397291	n/a	n/a	n/a	n/a	36	39	36	30
NEA	Copy Lane, Netherton	336635	399491	n/a	n/a	n/a	n/a	29	28	29	29
NEB	Copy Lane, Netherton	336607	399446	n/a	n/a	n/a	n/a	39	39	35	34
NEC	Copy Lane/ Dunningbridge Road	336539	399477	n/a	n/a	n/a	n/a	43	40	39	32
NED	Cumberland Gate, Netherton	336492	399455	n/a	n/a	n/a	n/a	25	26	25	21
NEE	Copy Lane Police Station, Netherton	336574	399525	n/a	n/a	n/a	n/a	41	41	39	34
NEF	Copy Lane/ Northern Perimeter Road	336476	399553	n/a	n/a	n/a	n/a	36	32	32	27
NEG	Dooley Drive, Netherton	336672	399574	n/a	n/a	n/a	n/a	33	30	29	26
NEH	Cambridge Road/Preston New Road	336259	418787	n/a	n/a	n/a	n/a	29	n/a	n/a	n/a
NEI	Duke Street, Southport	333125	416894	n/a	n/a	n/a	n/a	25	n/a	n/a	n/a
NEJ	Liverpool Road, Ainsdale	331671	412328	n/a	n/a	n/a	n/a	25	n/a	n/a	n/a
NC10	Sandfield Road. Bootle	334855	394959	31	27	30	27	24	25	24	21
NC11	Sandfield Road. Bootle	334796	395034	30	26	28	28	***	24	25	22
NC12	Wadham Road, Bootle	334701	394552	24	22	24	22	***	n/a	n/a	n/a
NC14	Viola Street, Bootle	334262	394305	***	25	27	26	27	23	22	20
NC15	Sandfield Road. Bootle	334847	395048	34	***	n/a	n/a	n/a	n/a	n/a	n/a
NC18	Peel Road, Bootle	333206	396201	***	***	n/a	n/a	n/a	n/a	n/a	n/a

NC28	Marina Avenue, Litherland	333823	397545	29	28	30	30	29	26	26	23
NC29	Jersey Close, Bootle	334096	395354	***	***	***	n/a	n/a	n/a	n/a	n/a
NC47	Coronation Drive, Crosby	332080	399336	24	22	23	19	20	19	18	15
NC51	Apollo Way, Netherton	335928	399882	19	18	20	18	19	15	14	14
NC52	Green Lane, Thornton	333489	400980	30	29	31	30	31	28	25	22
NC56	Sterrix Lane, Litherland	334641	398660	***	***	***	n/a	n/a	n/a	n/a	n/a
NC66	Stapleton Road, Formby	328488	405877	14	14	***	n/a	n/a	n/a	n/a	n/a
NC74	Deyes Lane, Maghull	338682	402476	24	23	25	24	24	21	20	20
NC75	Deyes Lane, Maghull	338505	402502	23	21	***	n/a	n/a	n/a	n/a	n/a
NC76	Glovers Lane, Netherton	335500	399548	***	***	n/a	n/a	n/a	n/a	n/a	n/a
NC82	Fernhill Way, Bootle	335147	395002	38	33	35	34	32	31	31	28
NC83	Sandiways Avenue, Netherton	336067	398710	26	24	26	25	24	22	23	20
NC86	Crosby Road South, Seaforth	332685	396768	36	34	36	37	35	34	33	31
NC91	Shelley Street, Bootle	333577	396003	29	22	***	n/a	n/a	n/a	n/a	n/a
NC92	Spooner Avenue, Litherland	334610	397722	***	***	n/a	n/a	n/a	n/a	n/a	n/a
NC93	The Northern Road, Crosby	332538	399755	19	***	***	n/a	n/a	n/a	n/a	n/a
NC100	Hawthorne Road, Bootle	334786	395717	32	28	32	31	***	***	n/a	n/a
NC101	Hall Lane, Maghull	338190	401652	24	22	24	23	***	18	n/a	n/a
NC102	Green Hey Drive, Bootle	334597	399032	***	***	n/a	n/a	n/a	n/a	n/a	n/a
NC104	Peel Road, Bootle	333454	396104	***	***	***	n/a	n/a	n/a	n/a	n/a
NC105	Reeves Avenue, Bootle	335213	396230	24	n/a	n/a	n/a	n/a	n/a	n/a	n/a
NC106	St Mary's Grove, Bootle	334217	399003	19	***	***	n/a	n/a	n/a	n/a	n/a
NC107	Norton Street, Bootle	333571	396173	27	23	27	24	28	25	23	23
NC108	Wango Lane, Aintree	338567	398342	23	23	24	22	21	21	20	18
NC109	Aughton Road, Birkdale	333557	415816	16	***	n/a	n/a	n/a	n/a	n/a	n/a
NC112	Poplar Grove, Seaforth	332889	396811	n/a	***	25	27	28	27	25	24
NC114	Litherland Road, Bootle	334444	395768	n/a	n/a	29	28	25	27	n/a	n/a
NC115	Litherland Road, Bootle	334446	395761	n/a	n/a	29	n/a	n/a	n/a	n/a	n/a
NC116	Oak Street, Bootle	334402	395748	n/a	n/a	26	n/a	n/a	n/a	n/a	n/a
NC117	Ash Street, Bootle	334445	395673	n/a	n/a	26	n/a	n/a	n/a	n/a	n/a
NC118	Strand Road, Bootle	334396	395568	n/a	n/a	26	n/a	n/a	n/a	n/a	n/a
NC120	Cedar Street, Bootle	334365	395586	n/a	n/a	***	n/a	n/a	n/a	n/a	n/a
NC121	Kew Road, Southport	333731	414775	n/a	n/a	***	n/a	n/a	n/a	n/a	n/a
NC122	Grange Primary School, Netherton	335263	400077	n/a	n/a	n/a	n/a	***	***	***	***
NC123	Holy Rosary Primary School, Aintree	337949	399132	n/a	n/a	n/a	n/a	n/a	n/a	20	17
UK1	Norman Road, Bootle	334453	397130	25	25	28	n/a	n/a	n/a	n/a	n/a
UK2	Church Road, Litherland	334781	398054	38	32	36	33	33	32	30	27
UK3	Wayfarers Arcade, Southport	333605	417325	50	44	49	n/a	n/a	n/a	n/a	n/a
UK4	Crosby Road North, Waterloo	332170	398538	41	38	42	38	39	38	35	32
UK5	Elton Avenue Crosby	331433	399958	22	21	22	n/a	n/a	n/a	n/a	n/a
NEK	Hawthorne Road, Bootle	334781	395193	n/a	n/a	n/a	n/a	n/a	33	33	30
NEL	Breeze Hill, Bootle	335259	394977	n/a	n/a	n/a	n/a	n/a	43	39	38
NEM	Millers Bridge Industrial Estate, Bootle	333735	394594	n/a	n/a	n/a	n/a	n/a	41	40	37
NEN	Hawthorne Road, Litherland	333725	397573	n/a	n/a	n/a	n/a	n/a	34	34	31
NEO	Hatton Hill Road, Litherland	333690	397615	n/a	n/a	n/a	n/a	n/a	38	36	32
NEP	Ash Road, Seaforth	333343	397217	n/a	n/a	n/a	n/a	n/a	28	31	27
NEQ	Crosby Road South, Seaforth	332612	396982	n/a	n/a	n/a	n/a	n/a	35	35	33
NER	Green Lane, Seaforth	333174	397112	n/a	n/a	n/a	n/a	n/a	29	29	27
NES	Chatham Close, Seaforth	332712	397000	n/a	n/a	n/a	n/a	n/a	30	30	27

NET	Moorhey Road, Maghull	337547	400475	n/a	n/a	n/a	n/a	n/a	21	22	20
NEU	Moorhey Road, Maghull	337250	400580	n/a	n/a	n/a	n/a	n/a	24	25	22
NEV	Princess Way, Seaforth	332650	396919	n/a	n/a	n/a	n/a	n/a	n/a	39	36
NEW	Crosby Road South, Seaforth	332662	396824	n/a	n/a	n/a	n/a	n/a	n/a	38	37
NEX	Elm Drive, Seaforrth	332725	396840	n/a	n/a	n/a	n/a	n/a	n/a	33	***
NEY	Lathom Avenue, Seaforth	332682	396952	n/a	n/a	n/a	n/a	n/a	n/a	41	38
NEZ	Hicks Road, Seaforth	333199	397058	n/a	n/a	n/a	n/a	n/a	n/a	28	25
NFA	Bridge Road, Seaforth	333711	397368	n/a	n/a	n/a	n/a	n/a	n/a	33	29
NFB	Hawthorne Road, Litherland	334017	397317	n/a	n/a	n/a	n/a	n/a	n/a	38	32
NFC	St Phillips Avenue, Litherland	334218	397673	n/a	n/a	n/a	n/a	n/a	n/a	29	27
NFD	Church Road, Litherland	334280	397737	n/a	n/a	n/a	n/a	n/a	n/a	30	26
NFE	Church Road, Litherland	334617	397917	n/a	n/a	n/a	n/a	n/a	n/a	33	31
NFF	Boundary Road, Litherland	334984	398177	n/a	n/a	n/a	n/a	n/a	n/a	39	32
NFG	Sandiways Avenue, Netherton	335997	398790	n/a	n/a	n/a	n/a	n/a	n/a	28	26
NFH	Church Road, Netherton	334963	398131	n/a	n/a	n/a	n/a	n/a	n/a	45	37
NFI	Hemans Street, Bootle	333273	395963	n/a	n/a	n/a	n/a	n/a	n/a	36	34
NFJ	Dunningsbridge Road, Netherton	335815	398723	n/a	n/a	n/a	n/a	n/a	n/a	25	23

Bias Corrected Annual Mean NO₂ Diffusion Tube Results ($\mu\text{g}/\text{m}^3$) 2008 – 2015

Exceedences of annual mean NO₂ Objective are highlighted in red.

n/a = monitoring not carried out.

*** = either poor data capture or data not suitable due to outwith specified sampling period.