Three Rivers District Council
Air Quality Action Plan
2015 - 2020

2020 Review

Contents

Introductory note

From 1st May 2019, TRDC delegated certain Environmental Health functions to Watford Borough Council including local air quality management.

NO_2 monitoring ceased in 2018 and monitoring of particulate matter ceased in 2017. WBC resumed the monitoring of NO_2 by diffusion tube in May 2019.

Watford Borough Council has undertaken a review of the existing TRDC AQAP (2015-2020), this review is considered an interim measure. The review includes updates on the measures included in the existing plan and updates in relation to revoked AQMAs. This review has been undertaken to ensure that the existing plan reflects the current situation.

WBC intends to draft a new AQAP in 2022. In May 2020, WBC will have gathered 12 months data, at this point WBC will undertake a review of monitoring locations. WBC intends to deploy diffusion tubes at new locations in January 2021. The new AQAP will be drafted in January 2022, once sufficient data has been gathered.

30th April 2020

1. Introduction

Since 2008 we have compiled annual reports detailing the action the Council has been taking to improve air quality in the Three Rivers district, through a variety of existing projects, initiatives and by air pollution monitoring and reporting. Some of the measures planned back in 2008 have progressed to fruition, while others have been less successful, due to the financial circumstances of the recession.

We must now look forward and consider the action we might reasonably be able to take over the next five years, bearing in mind that even deeper spending restrictions are planned within the lifetime of this Action Plan.

In terms of air pollution, Three Rivers is very similar to an outer London suburb. The majority of our population lives within the M25 and many workers commute into London or around the motorway network. Road transport emissions are the major contribution to the burden of air pollution we encounter in our district.

Tackling air pollution is vital to improve the health and quality of life of people who live in or visit Three Rivers, especially those who are vulnerable, such as children with asthma and older people with heart and respiratory diseases.

The House of Commons Environmental Audit Committee has published its report on air quality in the UK, this included evidence that estimated air pollution could be contributing to as many as 50,000 deaths in the UK per year. This is broadly in line with the result of a study commissioned by the Mayor of London, which suggested that around 4,300 deaths per year in London are partly caused by long term exposure to particulate matter (PM_{10} and $PM_{2.5}$), especially $PM_{2.5}$ which is widely acknowledged as being the pollutant which has the greatest effect on human health.

Three Rivers has met and will continue to meet the existing statutory air quality objectives for all but one pollutant: nitrogen dioxide (NO_2). Away from the M25, annual average levels of NO_2 are below air quality objective levels. However, our monitoring

programme shows that the annual air quality objective for NO_2 was only marginally compliant during 2014 at one location; junction 18 of the M25, where the A404 crosses the motorway.

**Concentrations of NO_2 measured in 2018 increased at six monitoring locations and decreased at seven monitoring locations.*

The diffusion tube monitoring results indicate that the annual or hourly-mean air quality objective for nitrogen dioxide was not exceeded at most of the monitoring locations in the district.

However, exceedances of the annual mean objective of 40 µg/m^3 were measured at the triplicate site at Belfry House on Uxbridge Road (Mill End 1). Two of the tubes recorded exceedances of the annual mean objective.

The proposals in this new air quality action plan for 2015 - 2020 aim to encourage reductions in emissions from road traffic, industry and homes. We also intend to keep the community and our partners well informed about air quality and the actions we can all take to reduce pollution or minimise its effects on vulnerable people. Some of the measures we are proposing, such as adopting the air*TEXT* service, have already been pioneered in London but are completely new to Three Rivers. Other measures, such as the ongoing encouragement to the public to consider smarter and more sustainable transport methods; cycling, walking and public transport, are familiar themes. Local authorities have a long tradition of measuring and reporting upon air pollution, so, during the lifetime of this Action Plan amongst other things, we aim to find out whether the pollution caused by high levels of very fine particles are a cause for concern locally. In addition, some completely new initiatives for the district are presented.

**Monitoring of particulate matter ceased in 2017. In 2019, TRDC requested that WBC remove the two AQ Mesh Sensors from their monitoring locations, these instruments were removed and placed in storage on 5th December 2019.*

2. Sources and Effects of Air Pollution

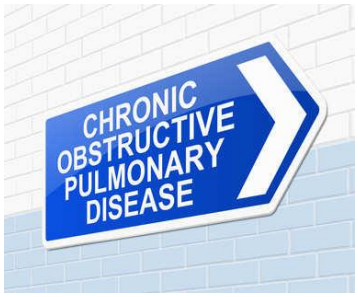
Pollution arises from a number of sources such as road transport and domestic emissions and can also travel great distances. It has been shown that around 25% of nitrogen dioxide (NO_2) concentrations in and around the greater London area come from outside the conurbation, with around 40% of particles from external locations.

In addition emissions from non-road sources are not insignificant that in 2011 around 50% of all emissions of oxides of nitrogen in the London conurbation originated from non-road sources (mainly domestic and commercial gas boilers).

Nitrogen dioxide (NO_2) / Oxides of Nitrogen (NO_x)

Oxides of nitrogen (NO_x) are emitted from all combustion processes, the main sources of which are road transport, energy generation including domestic gas boilers and industrial combustion. NO_x is made up of two pollutants; nitric oxide (NO) and nitrogen dioxide (NO_2). NO_2 is the pollutant of most concern due to its health impacts. However, as NO easily converts to NO_2 it is therefore essential that measures should be implemented to control emissions of all NO_x. Road transport make up the largest contribution of ground level concentrations in urban areas, and the highest NO_x levels

generally occur at the kerbside. In addition NO_x can react with Volatile Organic Compounds (VOCs) and sunlight to produce photochemical pollutants such as ozone. NO_x also contributes to the formation of secondary particles, which are associated with health effects.



The short term health effects of exposure to NO_2 are well established and at high concentrations can cause irritation of the lungs and can exacerbate existing lung conditions, including asthma and COPD (chronic obstructive pulmonary disease).

Particulate Matter (PM_{10} and $PM_{2.5}$)

Particulate matter (PM_{10} and $PM_{2.5}$) is made up of various materials and chemical compositions. It is categorised by the size of the particle, for example PM_{10} is made up of particles with a diameter of less than 10 microns (µm) and $PM_{2.5}$ less than 2.5µm.

The majority of PM emissions locally are caused by road traffic, with engine emissions and tyre and brake wear being the main sources.

Construction sites, with high volumes of dust and emissions from machinery are also significant sources of local PM pollution, along with accidental fires and bonfires. However, a large proportion of PM comes from natural sources, such as sea salt, forest fires and Saharan dust, as well as from sources outside the locality caused by human activity. Small particles tend to be long-lived in the atmosphere and can be transported great distances. This imported PM forms a significant proportion of total PM in the South East.

**Monitoring of particulate matter ceased in 2017. In 2019, TRDC requested that WBC remove the two AQ Mesh Sensors from their monitoring locations, these instruments were removed and placed in storage on 5th December 2019.*

Air Pollution and Health

The European Environment Agency describes air pollution as “the environmental factor with the greatest impact on health in Europe” and “responsible for the largest burden of environment-related disease”. Estimated air pollution deaths in Hertfordshire rose from 5.8% in 2010 to 6.05% in 2011 and it is now the worst performing area outside London.

There is a clear link between poor air quality and health, high levels of pollutants such as nitrogen dioxide, sulphur dioxide and ozone can have impacts on sensitive people including children, the elderly and those who suffer from respiratory problems like asthma and bronchitis. Particulate matter aggravates heart and lung conditions, and

research has found that about 5 percent of emergency hospital attendances for asthma could be avoided by meeting the PM_{10} air quality objective levels.

It has been estimated that the economic cost of the health impacts of poor air quality in London could be as high as £2 billion. Therefore reductions in missions and exposure can have significant savings in health budgets. Consequently it is worth investing in preventative health care measures such as the *air*TEXT service. Estimates have also shown that air pollution reduces life expectancy in the UK by an average of six months. The most important air pollutant in terms of health effects is Particulate Matter (PM) which is emitted from vehicle exhausts, chimneys or formed in the air from reactions between other pollutants. The World Health Organisation (WHO) has advised that there is no safe exposure level to PM. For people with lung and heart conditions, increases in PM air pollution can worsen their symptoms.

Air Quality Index

On 1st January 2012 DEFRA and the Devolved Administrations changed the air quality index for the UK. The index informs the public about daily changes in air quality using a 1-10 scale divided into four bands ('low', 'moderate', 'high' and 'very high'). This is similar to the index used for sun and pollen exposure. This index provides warnings of potentially health-damaging air pollution events before they happen and help susceptible people manage their condition and reduce the severity of their symptoms.

The daily air quality index comes in three parts and includes additional advice for susceptible individuals alongside advice for the general population, the revised air pollution banding and health advice is provided in Appendix II.

3. Air Pollution Monitoring and Current Air Pollution in Three Rivers

Our air pollution monitoring network comprises 5 non-automatic NO_2 monitoring locations using 8 diffusion tubes at roadside/kerbside and receptor sites, Details of these diffusion tube sites are provided in the 2013 USA Report at Appendix 1.

**TRDC undertook non-automatic (passive) monitoring of NO_2 at 9 sites during 2018, this included two triplicate sites on the A412 Uxbridge Road (Belfry House, Mill End 1 & Long Lane, Mill End 2). These have been in place since April 2017.*

As part of the Air Quality Review and Assessment process all Local Authorities in the UK are required to produce periodic *Updating and Screening Assessment* (USA) reports of air quality in their area. Each USA is intended to identify significant changes in air quality that may have occurred since the last report, which might lead to a risk of the air quality objectives being exceeded.

The recent 2014 Progress Report (in fulfillment of Part IV of the Environment Act 1995 Local Air Quality Management) again confirms that just one residential location within the district only marginally met the annual air quality objective for NO_2 in the period

April 2013 – March 2014. This is adjacent to the clockwise carriageway of the M25 at junction 18, where the A404 crosses the motorway. The monitoring location is within the grounds of a residential care home and is within the air quality management area. Monitoring will continue at this location to confirm, within the next 2 - 5 years, whether or not this AQMA may be revoked.

**The 2019 TRDC Air Quality Annual Status Report (ASR) identified that measured concentrations of NO_2 continue to be below the air quality objectives within the current AQMA's. There has been a continued downward trend at the established monitoring sites and measured concentrations have been consistently below the annual objective for NO_2 over the last 6 years.*

The Council has revoked the NO_2 Kings Langley AQMA and NO_2 and PM_{10} Chandlers Cross AQMA.

In 2018, a detailed assessment was undertaken to determine whether the remaining AQMA's in Chorleywood could also be revoked. The modelling study indicated that there are no exceedances of the NO_2 and PM_{10} annual mean objective at locations with relevant exposure in the area surrounding Junction 18 of the M25.

The modelled PM_{10} concentrations were lower than the 40 $\mu g/m^3$ annual mean limit value, the maximum modelled PM_{10} concentration at the discrete receptors was 18.4 $\mu g/m^3$. The results indicate that annual mean NO_2 concentrations are close to the air quality objective of 40 $\mu g/m^3$ at locations where relevant exposure may be present.

It was recommended that TRDC continue to measure NO_2 and PM_{10} and not revoke the AQMA.

Air Quality Objectives in England

Pollutant	**Air Quality Objective**		**Date to be achieved by**	**Achieved in TRDC?**
	Concentration	**Measured as**		
Benzene	16.25 µg/m^3	Running annual mean	31.12.2003	✓
	5.00 µg/ m^3	Annual mean	31.12.2010	✓
1,3-Butadiene	2.25 µg/ m^3	Running annual mean	31.12.2003	✓
Carbon monoxide	10mg/ 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 (NO_2)	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	Marginal compliance during 2013/14

Particulate Matter (PM_{10}) (gravimetric)	50 µg/ m^3, not to be exceeded more than 35 times a year	24-hour mean	31.12.2004	✓
	40 µg/ m^3	Annual mean	31.12.2004	✓
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	✓

The table above gives the indication that air quality in Three Rivers largely meets statutory objectives, but this is no cause for complacency. Our Air Quality Action Plan will assume that the 2013/14 compliance is not sustainable and therefore our plan, and the actions that Three Rivers DC might reasonably take to reduce air pollution, will continue until 2020.

4. Predicting future air quality in Three Rivers

The Environment Act 1995 requires local authorities to undertake regular reviews of current air quality in their area, and assess whether the air quality objectives are likely to be met by the compliance date in areas where exposure of the public is likely over the averaging period of the objective.

Where breaches of the air quality objectives are predicted, local councils must declare Air Quality Management Areas and produce Air Quality Action Plans, containing measures aimed at achieving the objectives. There is no legal requirement for councils to achieve the objectives, as a significant proportion of the air pollution in a particular area will have its source outside of that area and is therefore beyond the control of the local authority. The duty of councils is to take steps to try to meet the objectives, identify who is responsible for the pollution and seek their co-operation in minimising it.

A formal Review and Assessment process takes account of new and predicted major development within the local authority's area year on year. At the time of writing, no such development is foreseeable during 2015 and 2016 and detailed assessments, in terms of computer modelling, have not been carried out. The 2014 report is at Appendix I.

**The 2019 Air Quality Annual Status Report (ASR) can be found on the following webpage:*

https://www.airqualityengland.co.uk/local-authority/hnb-reports.

However the proposed expansion of Heathrow Airport and construction works for HS2 will have an unpredictable impact upon local air quality. It is only prudent to assume that this impact is unlikely to be beneficial within Three Rivers and that we shall need an Air Quality Action Plan for the next 5 years, at the very least.

5. Action Three Rivers has taken so far to Improve Air Quality

Air Quality Management Areas

In 2001 we declared 5 Air Quality Management Areas (AQMAs) centred upon 3 residential locations straddling the M25 motorway. In the absence of any reliable empirical data, such as actual pollution measurements, these declarations were made by relying upon mathematical computer modelling. Although this method was the best available at that time the calculations were incorrect and since 2001 we have been in a position to revoke all but one AQMA; our largest situated at Junction 18 of the M25, which is for the pollutant **NO_2**. We have been able to do this by monitoring levels of NO_2 within the areas and by reviewing the methods used to calculate the need for the AQMAs in the first place.

**TRDC's Executive Committee approved the revocation of the NO_2 Kings Langley Air Quality Management Area (AQMA) and NO_2 and PM_{10} Chandlers Cross AQMA. TRDC sought advice from the Department of Environment, Food and Rural Affairs (DEFRA) upon how to revoke the AQMAs. These AQMAs have now been revoked, the orders revoking the AQMAs came into force on 1st July 2019. There are two remaining AQMAs in Chorleywood (for NO2 and PM10).*

In 2007 we adopted an objective to provide encouragement and support the Highways Agency in any actions that will result in a reduction in pollution levels from the M25 motorway. At that time, prior to the widening to 4 lanes in each direction, the Highways Agency predicted that that *"the widening would relieve the congestion currently experienced and therefore improve air quality due to efficient engine performance."*

At that time our support to the Highways Agency consisted of an offer to relocate our fully automatic pollution monitoring station to a compound at Junction 18, adjacent to the anticlockwise entry slip and to share the running costs with the Agency. For a number of reasons, stated to be technical and operational, this offer did not come to fruition. However the Council will continue to work with the Highways Agency to promote air quality and reduce congestion wherever and whenever we can.

*TRDC's automatic monitoring site (HB125) that was located at the Fire Station in Rickmansworth was closed on 01/11/2011.

Encouraging Alternative Modes of Transport

We continue to support various initiatives developed by the County Council as part of the Hertfordshire Local Transport Plan. This Plan identifies a number of initiatives to encourage people to travel by modes of transport other than private car. These initiatives offer significant air quality benefits as they promote walking, cycling, public transport and other alternatives and improvements to car use, reducing overall emissions.

In 2013 The County Council's priorities were set out in the Local Transport Plan 3 (LTP3) and associated daughter documents, the Walking, Cycling and Bus Strategies.

The District is developing strategies to develop Sustainable Travel and Better Buses to inform how it will support the County Council's bus services. This will feed into the next Bus Strategy, which is also currently being revised to address proposals by the

County Council to reduce it's funding for bus routes. The District Council has supported various local bus services in partnership with the County Council, to connect local people with essential services in areas where bus services are not provided by private bus companies. It currently supports services to connect South Oxhey with larger shopping centres and to improve access to local rail stations and hospitals, at a cost of nearly £90,000.

In 2010 a TravelSmart Project was introduced. Partly funded by the National Lottery, this was a Personalised Travel Planning initiative by Sustrans supported by TRDC, HCC and the Institute for Transport and Infrastructure Research (SocialData). The project aimed to reduce car use in the area by promoting the options for walking, cycling and use of public transport. By September 2011 an initiative involving Croxley Green was completed, resulting in measurable reductions in car dependency with more people walking, cycling and using public transport. The District Council intends to carry out similar projects in other parts of the District as funding becomes available.

We have also supported OLEV initiatives to install Electric Vehicle Charging points across the Country, with one well-used point installed and several more planned.

Encouraging Cycling

Cycle Routes

Working in partnership with other organisations including Hertfordshire County Council, the Canal and River Trust and neighbouring local authorities we are developing a network of safer, convenient and more attractive cycle routes throughout the District, to encourage cycling by all kinds of new and experienced users.

We support the County Council objectives to ensure that the design of new roads or road improvements promote the safety and needs of cyclists, to enable and encourage more bicycle journeys to replace car use.

Routes enhanced in response to the Three Rivers Cycling Strategy include:

The Grand Union Canal towpath improvements have created over 5 miles of new surfacing and improved widths to connect Rickmansworth and the National Cycle Network with Abbots Langley, Hunton Bridge, and the Kings Langley Business Area between 2013 and 2015.

The South Way Cycle way is a new 1.3 mile route built in 2014/12 which links an existing shared cycleway to a the new Leavesden estate and Country Park with the Grand Union Canal. It has several links with designated quiet routes in and around Abbots Langley and Leavesden and forms an important link for residents to reach the Canal towpath.

The Mill End to Rickmansworth route is nearly 2 miles long and was built in 2012. It introduced a signed advisory route on quiet residential roads to connect the Southern

part of the District into the network, giving new and less experienced cyclists an alternative to the busy, narrow A412. It specifically gives access to local schools and connects the Maple Cross signed advisory route to the network.

The Maple Cross signed advisory route is a 1 mile route runs on widened shared footway on the A412 and service roads to provide a quieter option for people cycling to the village of Maple Cross and the Maple Cross Business Area which features several prestigious local businesses.

Schemes identified for development in the near future include routes linking Abbots Langley and Bedmond to the Garston Schools cluster, improvements to Rickmansworth Town Centre routes and an aspirational route to connect Chorleywood with the local and national cycle networks.

Greenways

We support and implement measures where appropriate to assist in the creation and maintenance of Greenways; a network of largely car free off-road routes allowing shared access for people of all abilities by foot, bicycle or on horseback. We plan to investigate linking essential services and public facilities within the district with Greenways, where possible linking into networks outside the District such as the Hertsmere Greenways and St. Albans Green Ring project.

One Greenway was completed in 2011, linking Mutton Wood, Oxhey Lane to the Merry Hill Greenway which goes on to Bushey Heath. Further schemes are under consideration including the Attenborough's Fields proposal which would link South Oxhey with Bushey Village to provide a viable and quiet alternative to the busy A411.

Measuring and Reporting upon Local Air Quality

We measure NO_2 at 5 locations within the District and our results are reported at http://www.hertsbedsair.net/. Our continuous automatic air pollution monitoring station at Rickmansworth Fire Station was decommissioned in November 2011 due to the cost of maintenance and reliability problems. There are no plans to reinstate it in its current form.

**TRDC undertook non-automatic (passive) monitoring of NO_2 at 9 sites during 2018, this included two triplicate sites on the A412 Uxbridge Road (Belfry House, Mill End 1 & Long Lane, Mill End 2). WBC will undertake a review of the monitoring strategy after May 2020.*

Land Use Planning

Our Core Strategy and development management policies require that we always take the impact upon air quality into account when considering all planning applications and particularly when these are within or closely adjoining any Air Quality Management Area. Air quality will take into greater consideration in the future by greater inclusion in development plans which should follow current air quality responsibilities as outlined in the relevant current planning guidance on air quality.

Applicants for Planning Permission are required to assess the impact of proposed development on air quality. The Policy states that development will not be permitted where there is an adverse effect on an Air Quality Management Area. Applicants are also required to submit a 'CPLAN Energy and Sustainability Statement' demonstrating the extent to which sustainability principles have been incorporated into the location, design, construction, future use of proposals and the expected carbon emissions.

Our on line sustainability statement includes a question 'Is your development in or near an Air Quality Management Area?' and includes a link to a map showing the AQMAs. If the answer is 'yes' then the applicant is asked 'Is the development expected to have any adverse impact on air quality?' and a link to the corresponding Development Management Policy DM8 is provided.

Development will not be permitted where it would have an adverse impact on air pollution levels, particularly where it would adversely affect air quality in an Air Quality Management Area. If the proposed development is within an AQMA then the applicant has to provide details of any remedial measures in the sustainability statement and these will be considered as part of the application process.

**There are two remaining AQMAs in Chorleywood (for NO2 and PM10). The Council is preparing a new Local Plan for Three Rivers which will provide the planning policies and proposals for future sustainable growth in the District up to 2036.*

Energy Efficiency and Reducing Fuel Usage

Since 2007 much work has been done on the promotion of energy efficiency.

The Council's Home Energy priorities are set out in our HECA report 2013-15[1] and the Council is a founding member of *Green Deal Together*, a green deal provider funded by 15 local authorities.

The partnership with Mitsubishi has provided a ground source heat pump at Three Rivers House. In addition a solar PV array has been installed on Watersmeet theatre, office lighting has been optimised and changed over to sensor controlled LED, our main offices have installed a voltage optimisation system and our IT servers have been consolidated and updated.
As previous funding for energy efficiency ended, the Council has been at the forefront of a move to Green Deal through investment with other local authorities in establishing a Green Deal Provider Company. The Council was also successful in securing ECO[2] and DECC[3] (Department of Energy & Climate Change) Fuel Poverty funding which enabled a joint project with Watford Borough Council and Watford Community Housing Trust to deliver external wall insulation to a fuel poor and hard to treat estate in the district. This project has been completed and 118

As part of the Hertfordshire wide Keep Warm Stay Well initiative visits have been undertaken to vulnerable residents in the district providing bespoke advice on how to improve their home energy efficiency.

We continue to work with the Green our Herts awareness group of the Hertfordshire Sustainability Forum to promote sustainability including energy efficiency and have expanded the 'Our climate is changing website' across the county and rebranded it as Green our Herts[4]

We have continued to promote awareness of energy through the Green our Herts website and articles in Three Rivers Times and the Environment e-newsletter.

In conjunction with other Hertfordshire authorities we have raised awareness of energy use through an 'energy vampires' campaign, including adverts, posters and leaflets across the county.

A consultation was recently initiated on *Green Expectations*[5], a sustainability and climate change strategy which includes aims and objectives to reduce energy use.

No work has yet commenced on promoting reductions in fuel usage by the Council's vehicle fleet, which comprises directly owned refuse collection and street cleaning vehicles.

In 2010 a proposal was put forward to encourage the take up of low or zero emission vehicles by Council employees who use their own cars for business purposes. This proposal did not progress due to financial uncertainties at the time.

Green Travel Plans

These are initiatives aimed at encouraging employers to review the suitability of car pool schemes and any car allowance systems that they use, to establish the most effective system to include fairness and benefits to air quality.

Travel Plans are a very effective way for the Council to reduce car use through a grant of planning permission for certain new developments, by requiring employers and other local land owners to demonstrate how their new development will help meet this objective. Over 21 Plans have been agreed and are being monitored by the County Council to ensure their effectiveness.

1 http://tinyurl.com/nelwmw6
2 http://tinyurl.com/bvkl426
3 http://tinyurl.com/agedhw5

The Council also has a Travel Plan in place, which has been monitored and improved over the last eight years. It encourages staff to walk, cycle and car share using various tools and initiatives and is currently under review to improve it's effectiveness. The provision for cycling storage is currently oversubscribed and several new measures are planned to reduce the Council's car use.

Emissions from Industry, Commerce and Domestic premises

We regulate emissions from a range of industrial and commercial premises using the provisions of the Environmental Permitting Regulations 2010. In Three Rivers such premises and processes include petrol stations and dry cleaners, timber treatment and cement batching plant. We also regulate emissions from a crematorium. At the time of writing there are 24 such permits issued, which are renewed annually. They can be viewed at: http://tinyurl.com/kn69hj8

**The 2010 regulations have been replaced by the Environmental Permitting (England and Wales) Regulations 2016 SI No. 1154.*

General Guidance to the permitting regime can be found at http://tinyurl.com/qyq9ot3

Short lived incidents of air pollution are often caused by construction and demolition sites, whether by windblown grit and dust or by the burning of waste. Controls are available under the Clean Air Act and Environmental Protection Act. Bonfires produce many forms of pollution. Bonfire smoke can have damaging health effects and although serious harm is unlikely if exposure is brief, it can cause significant problems for people with asthma, bronchitis and heart conditions. Bonfires generate around 30,000 nuisance complaints to local authorities each year. As well as causing health problems, smoke prevents neighbours from enjoying their gardens and opening windows or hanging washing out. We encourage alternative, more environmentally-friendly ways of disposing of refuse, by distributing home compost bins free of charge to residents and a free garden waste collection service.

Because of this we doubt that there is generally a need for bonfires, with exceptions for events like Guy Fawkes' Night and other cultural and religious festivals. We will continue to respond rapidly to bonfire complaints and enforce legislation where necessary.

4 http://www.greenourherts.org.uk/
5 http://www.threerivers.gov.uk/egcl-page/consultations

6. Striving for Cleaner Air; 2015 to 2020 – Short/mid term proposals

The previous section describes the actions we have taken so far that will help to improve air quality in Three Rivers. Many of these actions are ongoing and progress will be reported in future additions of this report. However, there are two firm initiatives that the Council will take forward during the early stage of this action plan.

6.1 *air*TEXT

Operated by Cambridge Environmental Research Consultants Ltd (CERC) *air*TEXT currently provides an air quality forecasting service for 33 London Councils (plus Slough) reaching around 11,000 registered users; this service comprises the following components:

- Three-day forecasts of NO_2, PM_{10}, $PM_{2.5}$ and ozone at street-scale resolution across Greater London using CERC's ADMS-Urban modelling system[6], detailed local emissions data, hourly weather forecasts and European regional forecasts.
- Free air quality alerts by SMS text, email and voicemail sent directly to subscribers.
- A Twitter account for each Council; air quality alerts are tweeted.
- Daily Health Bulletins for each Council.
- 3-day forecasts of air pollution, UV, pollen and temperature range in PDF form, designed to be printed out and pinned up in public spaces.
- These are emailed directly to Council staff for onward dissemination, as well as being available to download from the *air*TEXT website.
- An app for iPhone and Android showing the same information as the Daily Health Bulletin: 2-day forecasts of air pollution, UV, pollen and temperature range for each borough
- The *air*TEXT website which includes:

  High-resolution zoom-able air pollution forecast maps

  'Pins', showing the borough forecast for 'today' and 'tomorrow' for each borough

  Access to the Daily Health Bulletins for every borough

  A sign-up page for the air quality alerts by text, voicemail and email (each borough has password-protected access to a private online database containing the details of each subscriber within their own borough)

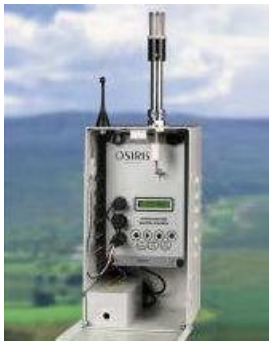
The intention is that Three Rivers will engage this service from April 2015, for a 3 year subscription period. The aim is to promote local take-up and encourage behavioural change, in terms of transport choices and personal protection during pollution episodes. Funding for this initiative has been made available by the Director of Public Health of Hertfordshire County Council.

**Measure 1. Subscription ran between April 2015 - April 2018.*

6 http://tinyurl.com/p6tu39g

6.2 *Monitoring for $PM_{2.5}$ (very fine particles)*

Hertfordshire is second only to London in terms of premature deaths caused by air pollution. Again working with the Director Public Health we intend to measure levels of $PM_{2.5}$ at two background locations within Three Rivers where human exposure to such particles occurs. $PM_{2.5}$ has only been monitored at just one location in Hertfordshire. Funding for this initiative is currently being finalised.



An *Osiris* ™ monitor for particulate matter.

Mounted on a lamppost it is mains powered and data is downloaded via mobile broadband.

What is $PM_{2.5}$ and why are we concerned about it?

Particulate matter (PM) is a term used to describe the mixture of solid particles and liquid droplets in the air. It can be either human-made or naturally occurring. Some examples include dust, ash and sea-spray. Particulate matter (including soot) is emitted during the combustion of solid and liquid fuels, such as for power generation, domestic heating and in vehicle engines. Particulate matter varies in size (i.e. the diameter or width of the particle). $PM_{2.5}$ means the mass per cubic metre of air of particles with a size (diameter) generally less than 2.5 micrometres (µm). $PM_{2.5}$ is also known as fine particulate matter (2.5 micrometres is one 400^{th} of a millimetre).

Inhalation of particulate pollution can have adverse health impacts and there is understood to be no safe threshold below which no adverse effects would be anticipated. The biggest impact of particulate air pollution on public health is understood to be from long-term exposure to $PM_{2.5}$, which increases the age-specific mortality risk, particularly from cardiovascular causes. Several plausible mechanisms for this effect on mortality have been proposed, although it is not yet clear which is the most important. Exposure to high concentrations of PM (e.g. during short-term pollution episodes) can also exacerbate lung and heart conditions, significantly affecting quality of life, and increase deaths and hospital admissions. Children, the elderly and those with predisposed respiratory and cardiovascular disease, are known to be more susceptible to the health impacts from air pollution. Potential mechanisms by which air pollution could cause cardiovascular effects are described in the Committee on the Medical Effects of Air Pollution (COMEAP) report Cardiovascular Disease and Air Pollution (2006)[7].

Sources of $PM_{2.5}$

Human-made sources of $PM_{2.5}$ are more important than natural sources, which make only a small contribution to the total concentration. Within UK towns and cities, emissions of $PM_{2.5}$ from road vehicles are an important source. Consequently, levels of $PM_{2.5}$ (and population exposure) close to roadsides are often much higher than those in background locations. In some places, industrial emissions can also be

important, as can the use of non-smokeless fuels for heating and other domestic sources of smoke such as bonfires. Under some meteorological conditions, air polluted with $PM_{2.5}$ from the continent may circulate over the UK – a condition known as the long range transportation of air pollution. Long range transport, together with pollution from local sources, can result in short term episodes of high pollution which might have an impact on the health on those sensitive to high pollution.

In addition to these direct (i.e. primary) emissions of particles, $PM_{2.5}$ can also be formed from the chemical reactions of gases such as sulphur dioxide (SO_2) and nitrogen oxides (NO_x: nitric oxide, NO plus nitrogen dioxide, NO_2); these are called secondary particles. Measures to reduce the emissions of these precursor gases are therefore often beneficial in reducing overall levels of $PM_{2.5}$.

Primary emissions of PM, the formation of secondary PM within the UK and long range transport of pollution from outside the UK all contribute to regional PM levels across the UK. Local primary emissions are also important in urban areas.

Legislative Controls for $PM_{2.5}$

European legislation sets out a number of requirements to control outdoor concentrations of $PM_{2.5}$. Member States are expected to ensure that the annual average concentration of $PM_{2.5}$ does not exceed 25 µg/m3. The legislation also aims to reduce the levels of $PM_{2.5}$ to which the population is exposed: as no threshold for the effects of long-term exposure to particulate matter on mortality has been identified, continuing to reduce overall population exposure to $PM_{2.5}$ even below this target value will have important public health benefits. Each Member State should achieve an Exposure Concentration Obligation[8] (ECO) of no more than 20 µg/m3 averaged nationally across background sites in major urban centres over 3 years. In addition, Member States are required to achieve a reduction in population exposure to $PM_{2.5}$ over a period of 10 years between 2010 and 2020.

Despite this there are no statutory Air Quality Objective for $PM_{2.5}$ in the UK, but Defra are currently running a consultation on review air quality management in England. Defra propose that $PM_{2.5}$ is included in local air quality management, in terms of measurement, reporting and action planning, but at the time of writing it is not known how strong the requirement will be. At the moment the requirement is for local authorities to have "regard to $PM_{2.5}$" in their air quality management work. This is considered too weak and instead local authorities should be required to *"work towards a decrease in public exposure (to air pollution) in all aspects of their work*". In addition to strengthening the requirement for action the explicit inclusion of exposure would more closely align Local Air Quality Management with Local Authority public health duties and also the EU Directive requirements on central government

Estimates of the Local Impact of $PM_{2.5}$

In April 2014 Public Health England published ***"****Estimating Local Mortality Burdens Associated with Particulate Air Pollution"*[9]

[7] http://tinyurl.com/ofwntwb
[8] http://tinyurl.com/6c3yjf4

Reference to Table 1 on page 14 of this report reveals that in 2010 in Hertfordshire it is estimated there were 514 premature or "brought forward" deaths associated with particulate air pollution, amounting to 5258 life years lost. Three Rivers share of this was 43 deaths and 440 life years lost.

Estimates of the National Impact of $PM_{2.5}$

The public health burden of exposure to outdoor $PM_{2.5}$ is estimated to be equivalent to 29,000 deaths per year in the UK (COMEAP, 2010[10]), whilst reduced exposure could yield annual benefits of £9-20billion (Natural Capital Committee, 2014[11]).

Local steps to decrease $PM_{2.5}$ exposure

These could be accomplished by:

- A decrease in emissions from primary pollutants.
- A decrease in the emissions of $PM_{2.5}$ precursors. Particulate nitrate and volatile organic compounds make a large contribution to our $PM_{2.5}$ concentrations and exposure. These arise from many sources including a sizable contribution from traffic and industry. Measures taken locally to decrease NO_X emissions from traffic for example, would be beneficial.
- Good design in the planning process to encourage low emissions development.
- Good design in the planning process to separate the public from areas with high concentrations of $PM_{2.5}$; planning of low pollution routes to schools and the design of school sites.
- Greater active travel; walking and cycling along low pollution routes providing many public health co-benefits.

*Measure 2. *TRDC deployed AQ Mesh Sensor instrumentation at two sites. One on Rickmansworth Rd, Chorleywood M25 J18 and the other at Mill End 1, Belfry House.*

Monitoring of particulate matter ceased in 2017. In 2019, TRDC requested that WBC remove the two AQ Mesh Sensors from their monitoring locations, these instruments were removed and placed in storage on 5th December 2019.

The Hertfordshire Local Authorities Report on Particulate Matter ($PM_{2.5}$) in Ambient Air in 2018 for Hertfordshire County Council Public Health November 2019 can be viewed at https://www.airqualityengland.co.uk/local-authority/hnb-reports.

9 http://tinyurl.com/o2kybfd
10 http://tinyurl.com/qx8r8xy
11 http://tinyurl.com/mvggd8c

7. Striving for Cleaner Air; 2015 to 2020 - Long Term Proposals

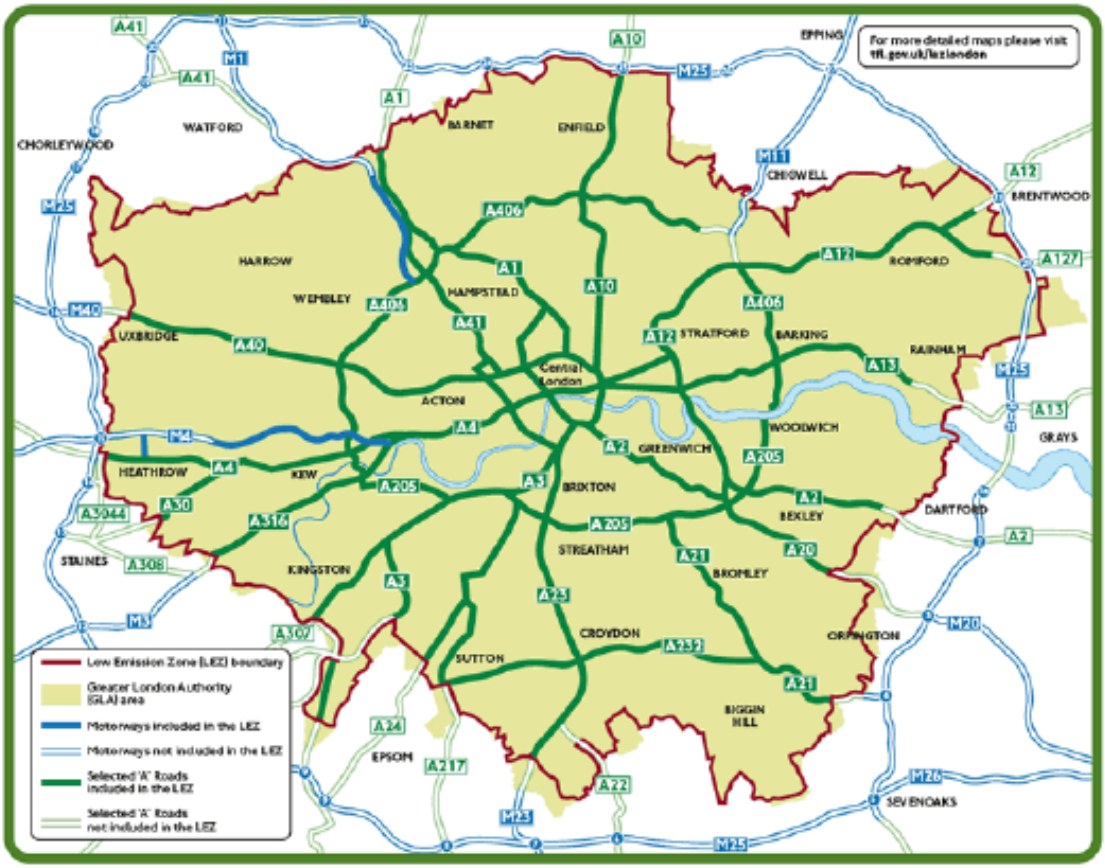
Extending the London Low Emission Zone up to (but not including) the M25 – Feasibility Study

Since 2003 there have been a number of reports[12] [13] that have investigated the feasibility and value of a Low Emission Zone that extends up to the M25.

Significant areas of Hertfordshire, Essex, Kent, Surrey and Buckinghamshire lie within the M25 ring. Locally, Hertsmere, Watford and Three Rivers have large urban and suburban areas of population that are not protected by the London LEZ. Indeed, such populations are likely to be disproportionately affected by vehicles that do not meet LEZ emission standards skirting the LEZ via local roads.

The London Low Emission Feasibility Study 2003 acknowledged both the benefits of a Low Emission Zone bounded by the M25 and the attendant difficulties in engaging with local authorities outside the Greater London Area for enforcement and monitoring.

Reference to the map below shows how the current London LEZ boundary is not coterminous with the M25 corridor. Only in Enfield is the LEZ boundary adjacent to the anticlockwise carriageway.



[12] http://tinyurl.com/jwhptl7
[13] http://tinyurl.com/qd99n7v

The London LEZ has been shown to work and we consider that the time is right to encourage the commissioning of further collaborative research into the feasibility of extending the London LEZ up to the M25. This could be in partnership with the other four upper tier transport authorities impacted by the boundary of the LEZ (Essex, Kent, Surrey and Buckinghamshire) or just with Hertfordshire, where three local Councils are affected.

Not included as a measure.

Three Rivers Freight Routes

We intend to apply for grant funding for a feasibility study into changing local road layouts and freight routes. This with the aim of reducing exposure to particulate and NO_2 pollution from HGVs.

As an example, the Uxbridge Road through Mill End is commonly used by HGVs via Riverside Drive and junction 17 of the M25. For much of its length the Uxbridge Road is residential, with houses close to the centreline and in some locations with front doors and windows opening directly onto the pavement. A more suitable HGV freight route would require HGVs to use the dual carriageway of Rectory Road and the 40mph Chorleywood Road to junction 18. Houses here are set well back from the roadside and pollution exposure is likely to be much reduced. At junction 18 both clockwise and anticlockwise entry ramps descend onto the motorway, thereby assisting the vehicle obtain motorway joining speed.

At the moment, this supposition needs to be tested and a bid will be made for air quality grant funding to explore all freight routes in Three Rivers and to identify those suitable for change.

Not included as a measure.

Emissions from Public Transport

It is apparent that some privately operated buses displaced from the London LEZ because they do not meet pollution emission limits are a relatively common sight in Three Rivers. This is another example of how being on the periphery of a long established LEZ might compromise local air quality and pubic health in Hertfordshire.

Many of these vehicles are used on school transport routes, no doubt on grounds of cost. However, it is worth noting that passengers (and drivers) are not protected from vehicle emissions just because they are inside the vehicle. In fact they can suffer the worst exposure.

It is concern that some of the oldest and most polluting of passenger vehicles are used to transport the next generation to and from school. It is proposed that air

quality grant funding be sought to research real time and continuous exposure by passengers, by means of small portable units which are easily carried by the passenger.

The aim is to obtain a body of evidence that will inform education authorities who commission school transport contracts and the extended Low Emission Zone feasibility study.

Not included as a measure.

The following table summarises the measures to improve air quality included in the 2019 TRDC ASR:

Table 2.2 – Progress on Measures to Improve Air Quality

Measure No.	Measure	EU Category	EU Classification	Organisations involved and Funding Source	Planning Phase	Implementation Phase	Key Performance Indicator	Reduction in Pollutant / Emission from Measure	Progress to Date	Estimated / Actual Completion Date	Comments / Barriers to implementation
1	AirTEXT	Public Information	Via other mechanisms	TRDC	Complete	April 2015-April 2018	Hits on Hertfordshire Air Quality Forecast website	Exposure of most vulnerable	Operational	Apr-18	Hertfordshire Air Quality Forecast used to communicate air quality information across the district
2	2 x indicative PM2.5 AQ Monitors	Other	Other	TRDC	Complete	Apr-17	PM2.5 AQ Data	Inform future projects id required	Equipment installed	TBC	Equipment installed, however monitoring ceased in 2017.
3	LTP, Walking, Cycling and bus strategy	Promoting Travel Alternatives	Intensive active travel campaign &	HCC/ TRDC	Ongoing	Ongoing	Decrease in private car use	NO2/PM10/PM2.5	Ongoing	Ongoing	Support of DAR bus scheme; 3 new cycling improvem

			infrastructure								ent scheme; new footway along Aerodrome Way; cycle training etc
4	Improvement of bus network	Transport Planning and Infrastructure	Bus route improvements	HCC/ TRDC	Complete	Ongoing	Increased bus use	NO2/PM10/PM2.5	Ongoing	Ongoing	Improvements to six routes; Intalink Partnership of Hertfordshire bus and passenger transport operators and local authorities
5	OLEV initiative	Promoting Low Emission Transport	Procuring alternative Refuelling infrastructure to promote	HCC/ TRDC	Complete	Ongoing	Increase electric vehicle ownership	NO2/PM10/PM2.5	One charging point installed	TBC	No information provided
			Low Emission Vehicles, EV recharging, Gas fuel recharging								
6	Additional cycle routes	Transport Planning and Infrastructure	Cycle network	HCC/ TRDC	Complete	Ongoing	Increase cycling	NO2/PM10/PM2.5	Ongoing	TBC	3 new cycling improvement scheme
7	Alternative routes via green ways	Transport Planning and Infrastructure	Other	HCC/ TRDC	Complete	Ongoing	Use of greenways	Reduce exposure	Ongoing	TBC	No information provided

Appendices

Appendix I

Air Quality Progress Report 2013

**The Air quality Progress Report 2013 has not been included. *The 2019 Air Quality Annual Status Report (ASR) can be found on the following webpage:*

https://www.airqualityengland.co.uk/local-authority/hnb-reports.

The Air Quality Action Plan 2015-2020 (2015 Edition) can also be found on this webpage. The Air Quality Status Report 2013 is included as an appendix to the action plan.

Appendix II

Air pollution levels and health advice; table of UK Air Pollution Bandings

The Department of Health has developed an air pollution banding system which helps sensitive people manage their health. Maximum levels of five key air pollutants are considered by the system below:

Air Pollution Banding	Value	Accompanying Health Messages for At Risk individuals*	Accompanying Health Message for the General Population
Low	1 - 3	**Enjoy** your usual outdoor activities	**Enjoy** your usual outdoor activities
Moderate	4 - 6	Adults and children with lung problems, and adults with heart problems, **who experience symptoms**, should **consider reducing** strenuous physical activity, particularly outdoors.	**Enjoy** your usual outdoor activities.
High	7 - 9	Adults and children with lung problems, and adults with heart problems, should **reduce** strenuous physical exertion, particularly outdoors, and particularly if they experience symptoms. People with asthma may find they need to use their reliever inhaler more often. Older people should also **reduce** physical exertion.	Anyone experiencing discomfort such as sore eyes, cough or sore throat should **consider reducing** activity, particularly outdoors.
Very High	10	Adults and children with lung problems, adults with heart problems, and older people, should **avoid** strenuous physical activity. People with asthma may find they need to use their reliever inhaler more often.	**Reduce** physical exertion, particularly outdoors, especially if you experience symptoms such as cough or sore throat.

*Adults and children with heart or lung problems are at greater risk of symptoms. Follow your doctor's usual advice about exercising and managing your condition. It is possible that very sensitive individuals may experience health effects even on Low air pollution days. Anyone experiencing symptoms should follow the guidance provided below