On Thursday, 15 June 2017, 13:34, David Pavett wrote:

Dear Professor Mason,

I have attached the notes I made following the air quality presentation at the BCC meeting last Monday.

If my notes seem to be a somewhat negative reaction to what was said at the meeting this is not because I in any way want to play down the importance of the problem of air quality. It is, on the contrary because I want any campaigning on the issue to be as strong and robust as possible.

I am a member of the Osterley and Wike Green Residents' Association (OWGRA). We are concerned that despite the fact that our area includes some pollution hotspots e.g. the A4 and especially Gillette Corner there is no pollution monitoring in the area (apart from a few diffusion tubes in Osterley Park). We have complained to the council about this and have had vague commitments to "look in to the matter". We have little confidence in that and would like to know what we can do ourselves, possibly in conjunction with some university-based research. We have written to the air quality groups at Kings and Imperial. A couple of our members are participating in a sound monitoring project (supervised by Dr Anna Hansell, reader in environmental epidemiology, and Dr John Gulliver, senior lecture in exposure assessment). We understood that the sound measurement part of the project was to be followed by work on measurement of ultra-fine particles but we have, to date, received no information about this.

We want to be advised as the the range of options open to us. We started the process of applying for grants but we cannot pursue that without knowing what equipment might best serve our purposes. It would be great if we could have a chat with someone who knows their way round the issues. Maybe that could be interesting for a research student engaged in a monitoring project.

We are also somewhat confused by what appears to be contradictory information about the air quality situation in Hounslow. Some reports indicate a high level of exceedances and rising levels of pollution while others indicate the opposite. Reading the latest council air quality report (December 2016) it is difficult to understand why Hounslow should be an AQMA since everything is allegedly just fine. We suspect that this picture is misleading but we need to know how do demonstrate this if it is so.

I am sure that you are very busy but if it is possible to take a little time to suggest how we might best pursue the idea of independent monitoring of air pollution that would be highly appreciated. We have members with scientific backgrounds (physics, chemistry and biology) and are not afraid to read a certain amount of technical material, or learn how to use measuring equipment.

Regards

David Pavett

On Saturday, 1 July 2017, 17:14, Roger Mason

Dear Mr Pavett,

Apologies for taking two weeks to answer your letter and its attachment. There never seem to be enough hours in the day to do all the things one would like to do promptly.

You say in your attachment that you went to BCC meeting "with some knowledge of the issue (air pollution), but not much". However your letter and attachment shows that you have researched it well and the points you make are important ones. I support your view that air quality campaigning groups can only be effective if they deal objectively and accurately with whatever data is available on pollution. This accords with my views as a research scientist (a retired professor of biochemistry in the Faculty on Medicine, Imperial College). Debate and education will help local campaigners to be intellectually rigorous in discussing their topic and I suspect you are well placed to stimulate that! The campaign for better air quality needs all the support and enthusiasm it can get if it is to be successful.

In your letter you say you would like to know what you can do yourselves. You can easily make air quality measurements quite cheaply. Nitrogen Dioxide diffusion tubes can be purchased and analysed professionally for about £10 per tube. I attach a pdf of instructions on where to buy them, how to set them up and how to get them analysed which I produced for schools eco-projects I set up in Kew. I think you may even be able funds from Friends of the Earth to do this. You leave the tube exposed for about 4 weeks in the location of your choice. After analysis, the results come back to you as projected annual mean values of NO2/m3. If you wish, you can repeat the analysis on future occasions, since NO2 levels vary with the time of year, atmospheric conditions, traffic, local industrial activity etc. NO2 levels are widely regarded as good indicators of urban air pollution caused by traffic.

Measuring particulates is not so easy and until recently has involved large very expensive equipment, which is why even Borough environment health departments usually only measure PDs at a very limited number of sites. However technology is improving and although still quite expensive, you can now get mobile, battery powered units which simultaneously measure PM1,PM2.5, PM4 and PM10s. each air sampling takes only a few minutes and accumulated results can be fed into a computer via a USB connection. Envirotechnolgy's Model 831 Aerosol Mass Monitor is an example. For £2400 you get the unit, charger, USB cable and software.

Apart from "do it yourself" investigations you may be able to interest others with more funding to collaborate with you on projects. Currently I am working with London Sustainability Exchange (LSx) on a schools project which aims to raise local awareness of air pollution by going into three primary schools, getting children interested by showing them how to measure NO2 and PD's in the school and playground and then interacting with parents at PTA meetings. I'm also collaborating with Richmond Council Environmental Health on plotting pollution on various routes and ways of getting to school with the aim of choosing the best ones. I don't know how Hounslow would react to such collaborations.

Allow me to comment on some of the points you raise in your attachment. I'm not surprised that your meeting focussed on diesel engines and pollution. The recent VW scandal drew a lot of attention and frequent articles in the Evening Standard have tended to make people think that diesel engines are the only culprits! Only a few people will have read beyond that. You are quite right of course, all vehicles emit pollutants to a greater or lesser degree - even electric vehicles with their tyres and brakes. The Mayors policy addresses this as you have identified. Having said that, interpreting the available data is not always straight forward. For example the pie chart you show for PD10 contributors. Although it shows that diesels contribute 28% and petrol cars, 30% road transport PD10s, it does not take account of the fact that in 2013 diesel cars only accounted for ~33% of registrations while 67% were petrol , so a smaller fraction of the total fleet were contributing disproportionately to the PD10 generation. Moreover such pie charts are the product of computer modelling and in 2013, the model would use manufacturer's data for diesel car emissions, which subsequently were shown to be false. Even today "real life" emission tests by independent bodies indicate that diesel engines emit 7 times more pollutants than manufacturers claim - and some makes of cars are far in excess of that!

I think there is a particular focus on particulates at the moment because,whilst we have know for a number of years how harmful NOx is to pulmonary health, it is only in more recent times that evidence has accumulated to shown that particulates have very widespread effects on multiple organ systems. Even more recently, there has been an appreciation that PM2.5 and even smaller particles enter the lung and pass through the walls of the very small blood vessels,where oxygen exchange occurs, to gain access to the blood and via it to other organs in the body. These very small particles were not even measured widely until recently, even though now it looks as if they are the most dangerous to human health. There is also a problem interpreting PM data. Whilst some of the data you quote for PM10 for example may just about look acceptable if you take the UK/EU standard of 40ug/m3 as being the upper limit compatible with good health, it looks particularly "dodgy" if you apply the more rigorous WHO standard of 20ug/m3 as the upper limit. There are some experts who would say that there is no known safe level for nano-particles!

About two years ago some of us who were campaigning for clear air in and around Richmond came together to form an over-arching group with representatives from various local groups. We called it MASC (Make Air Safe and Clean, SW London). We have now been joined by representatives from quite a wide area of SW London and, as a result, I think we may in future be able to exercise more influence on decision makers. Would you be interested in joining the group, representing OWGRA?

With kind regards,

Roger Mason MD PhD FRCP

Setting up NO2 diffusion tubes

The diffusion tubes and other equipment can be purchased from Gradko Environmental (see details below). The tubes are attached to a lamp post or other suitable post and left in place to absorb the gas from the atmosphere over a period of 4 weeks. Tubes are then sent off to the Gradko laboratory for analysis. For each location surveyed you will need one tube, a tube holder and a fixing strap, total cost about £10. This price also includes the cost of analysis after exposure. I can advise on suitable sites and putting the tubes up if you would like me to.

Gradko are UKAS accredited. The NO2 diffusion tubes you need to order are specified as the "20% TEA/Water" type. TEA stands for triethanolamine, the NO2 absorbent which is built into the grey cap on one end of the tube. The other end of the tube has a detachable white cap.

To expose the tube:-

- Attach a tube holder about 7-8 ft above ground level to a post, drainpipe, fence post, etc., using a fixing strap. There should be free air flow around the holder.
- Stick an i.d. label (supplied by Gradko with each order) on the side of a diffusion tube.
- Remove the white cap from the other end of the tube. Retain the cap.
- Place the tube vertically in the holder on the lamp post, open end down.

Once put up, record the location, date and time on a record sheet (supplied by Gradko with each order) against a matching i.d. tag (supplied by Gradko) and leave in place for ~4 weeks. After this exposure period, take the tube down, capping the open end immediately with the white cap. Record the date and time on the record sheet. Calculate the number of exposure hours and enter it on the record sheet. Repeat the procedure for as many tubes as you expose at different locations. Then send off the completed record sheets and capped exposed tubes to Gradko for analysis. The diffusion tubes have a finite shelf life (date supplied by Gradko) so make sure you expose them and send them back for analysis within the shelf life period.

Gradko's web site is http://www.gradko.com/environmental - then go to Environmental Shop Products NO2 and nitrogen oxides diffusion tubes. For small orders I have found the easiest way is to phone (01962 860331) and follow up with an email giving an order number or credit card, but they will advise. The catalogue numbers are:-

[1] 20% TEA/water NO2 tube, DiF100-20WA
[2] 760mm fixing strap, DiF2001
[3] Holder clip, DiF1000.

NB. Personal safety tip. I use a small stepladder and I wear a yellow high visibility jacket (Halfords) when putting up tubes beside main roads. The speed and proximity of some passing HGVs is remarkable!