

BREATHE CLEAN AIR GROUP

MANIFESTO FOR CLEAN AIR IN GREATER MANCHESTER

Transport for Greater Manchester has endorsed a policy and procedure for improving air quality in Greater Manchester with regard to transport and traffic air pollution and I support this. The TfGM policy is aimed at reducing nitrogen dioxide and particulate matter caused by vehicle exhaust fumes.

However, air pollution in Greater Manchester is getting worse from other, more toxic, sources such as Incineration, Power generation, Industry including wood processing, and domestic and commercial wood-burning appliances. The Government's rush to biomass is ill-founded since burning biomass produces: more carbon dioxide than burning coal (thus increasing Global Warming), many more polluting chemicals including dioxins (which are carcinogenic), heavy metals (including lead, arsenic and chromium), as well as masses of very fine Particulate Matter which is not even measured, let alone captured.

Air pollution by chemicals, particulate matter, smoke and wood dust creates a variety of ill-health impacts such as asthma, COPD, heart attacks, strokes, cancer, autism and Alzheimer's disease, as well as suspected links to other ill-health issues. It is well known that air pollution damages the development of children's lungs, and adversely affects the unborn foetus.

DECLARATION.

Therefore, I believe that we must control or even ban these dangerous processes by:

- a) more in-depth scrutiny and refusal by Local Planning Authorities, for planning applications that have air-polluting processes, especially near residential areas;
- b) better and independent measuring and monitoring of air-polluting processes;
- c) challenging the Environment Agency to identify dirty processes and encouraging the EA to refuse to issue Environmental Permits when necessary;
- d) challenging the Government's policy that allows air polluting processes to flourish;
- e) declaring that Greater Manchester becomes a Biomass-Free Zone;
- f) launching a campaign to ban/discourage domestic wood-burning stoves;
- g) doing all I can to stop the Barton Renewable Energy Plant;
- h) doing all I can stop wood dust pollution endangering neighbours.

I shall also support non-carbon based energy generation, such as solar, wind, hydro, tidal and wave power.

Signed

Candidate in the Greater Manchester Mayoral Election 2017

CASE STUDY 1: BARTON RENEWABLE ENERGY PLANT, TRAFFORD.

Trafford Council initially refused the construction of Barton Renewable Energy Plant, proposed by Peel Energy, to be located on the south bank of the Manchester Ship Canal, alongside an Air Quality Management Area, in Davyhulme, Trafford. The proposal was to burn waste construction and demolition wood and up to 20% solid recovered fuel including the Peel Group's waste from the Trafford Centre and other enterprises. It may also burn wood chip imported from North American virgin forests. However, the Government allowed this development to proceed.

The plans show that it will not be using Best Available Techniques. The furnace temperature will be too low (at 850 degrees C, it will not destroy deadly dioxins); it will use an out-dated bag-filtration system (not able to capture deadly Particulate Matter); and a low chimney stack (at 44.23 metres, too low to adequately disperse emissions). In fact Environment Agency officer Simon Holbrook divulged that it ought to be twice the height. The developer also presented a flawed environmental plan to the Environment Agency, but it issued an Environmental Permit anyway.

This type of wood-burning incinerator is notorious for producing emissions of heavy metals, Particulate Matter, dioxins, polycyclic aromatic hydrocarbons and nitrogen dioxide as well as 50% MORE carbon dioxide than burning coal. Although the Incinerator has not yet been built, its close proximity to housing, retail outlets, sports and leisure facilities and the M60 high level bridge, gives great cause for concern.

Alongside the proposed incinerator is the Davyhulme Wastewater Treatment Facility which was given planning permission to build 5 biogas engines (burning methane from sewage waste to generate electricity and emitting carbon dioxide). It has also been given planning permission for several huge storage tanks for highly flammable material including LPG. Alongside the Wastewater Treatment Facility, Trafford Council has granted planning permission for a Coal Bed Methane fracking venture which is well known for contaminating the air and groundwater with numerous organic toxins including benzene. The nearby Port Salford on the north bank of the Manchester Ship Canal will generate Particulate Matter and nitrogen dioxide from diesel operated vehicles and marine diesel fuelled ships and barges. Two (and possibly a third) gas fired Power Stations at nearby Carrington will produce carbon dioxide and nitrogen dioxide which will be carried on the prevailing wind towards Davyhulme. The same prevailing wind will take all these air pollutants on to Salford Quays and Manchester city centre.

A nearby school, Kingsway Primary School, has already been identified by DEFRA as being in the top 10 worst primary schools for air pollution.

The campaign group Breathe Clean Air Group is monitoring nitrogen dioxide in order to establish a benchmark for the local area. So far they have three years of monthly NO₂ readings at several points along the M60 motorway, Urmston town centre and local schools. Although the legal limit for nitrogen dioxide is 40 ug/m², most of the locations monitored by BCAG are now nearly double the safety standard.

CASE STUDY 2: WOOD DUST FROM WOOD-PROCESSING PLANTS.

Residents in Mossley, Tameside, Greater Manchester, are greatly concerned about the ill-health effects of wood dust issuing from a nearby wood processing plant. Social media working revealed a number of communities across the UK (including Horwich, Bolton), experiencing similar health issues when living near waste wood recycling and processing plants. Symptoms include respiratory effects, nasal septum erosion, nosebleeds, rhinitis, lung infections, sore and runny eyes and nose, sore throats, headaches and fatigue. More recent concern have been raised about Alzheimer's disease/dementia and cancer. Documentation shows complaints of dust emissions in residential areas since 1996 as well as a Site of Special Scientific Interest.

Wood dust was classified as a Group 1 Carcinogen by the International Agency for the Research on Cancer (IARC) for the World Health Organisation in 1995. Employees of such plants are protected under H&S legislation, but the same dust is only classed as a "nuisance" to exposed residents. Local residents noticed that monitoring programmes were not carried out during summer when the conditions were at their worst.

Residents undertook a Citizen Science Investigation and found that Environment Agency and Local Authority testing detected aluminium, barium, boron, cadmium, chromium, copper, iron, lead, magnesium, manganese, nickel, potassium, sodium, strontium, and zinc. Samples also contained brick coloured dust, carbonaceous

material, crystalline fine particles, foam, glass pieces, lignin, metal fragments, mica, paint chips, plastic, phloroglucinol, quartz, rubber, textile fibres, vegetable matter and very large amounts of sawdust-like particles. Independent dust sampling also detected these particles as well as formaldehyde, sulphates, calcium, fluorides, flyash, gypsum, lanthanum, limestone, phosphorus, silica sand, sulphates and titanium. BSI Code of practice PAS 111 says, "There are over 30 contaminants that could be present in waste wood including oil, tar, cardboard, plastic bottles, rubber, silicone, ferrous and non-ferrous metals, aggregate, rubble, bricks, grit, glass, plasterboard and textiles." There is also the danger that waste from construction and demolition sites contains asbestos, fibreglass and discarded chemicals.

The Mossley Environmental Action Group found that out of 72 families with homes backing onto the wood processing plant in Mossley, eight people have suffered from cancer and five from Alzheimer's disease/dementia, which is much higher than the national incidence rate. One of the cancer cases was male breast cancer, of which there are only about 300 cases per year in the UK. A number of residents have suffered regular nose bleeds, including one case which resulted in a hole in the septum.

The action group members also found that the wood processing company had placed dust monitoring devices up-wind of their plant, thus avoiding the majority of the airborne dust emitted from the plant. These monitors were not capable of capturing the most harmful, tiny particles and were not "chemically" analysed.

EVIDENCE OF THE EFFECTS AND DANGERS OF AIR POLLUTION.

BBC Science and Environment, 23 Feb 2017, "**Most wood energy schemes are a disaster for climate change**". Duncan Brack, former special adviser at the UK Department of Energy and Climate Change says "Burning wood pellets can release more carbon than fossil fuels like coal, per unit of energy over their full life cycle."

BiofuelWatch 24 December 2015, "**Doctor's Orders: Wood burning hazardous to your health.**" Dr Brian Moench, Utah Physicians for a Healthy Environment says "Wood smoke is uniquely toxic among all contributors to urban air pollution. The free radical chemicals in wood smoke are active forty times as long as those from cigarette smoke, resulting in a greatly prolonged opportunity to damage individual cells. Other studies suggest that the lifetime cancer risk from wood smoke is 12 times greater than that from an equal volume of second-hand tobacco smoke."

The Examiner, 17 February 2017, "**Air pollution linked to Kirklees baby deaths, says campaigner**". Environmental Researcher Michael Ryan says "Air pollution rather than poverty is the reason for high numbers of baby deaths in parts of Kirklees. Areas such as Dewsbury and Batley not only have the highest levels of deprivation in the borough, they also have the poorest air quality. At 13.2 deaths per 1,000 births, North Kirklees had the highest infant mortality rate in England in 2014 according to figures from NHS England."

BBC World News, 6 March 2017: **WHO chief says Air Pollution linked to 600,000 deaths in children.** The Director General of the World Health Organisation has said "Air pollution is one of the most pernicious threats facing global public health today and is on a much bigger scale than HIV or Ebola."

The Guardian, 16 February 2017. "**Millions of Premature births could be linked to air pollution, study finds.**" Researchers for the Stockholm Environment Institute, the London School of Hygiene and Tropical Medicine and the University of Colorado have concluded that as many as 3.4 million premature births across 183 countries could be associated with fine Particulate Matter."

News4Trafford 16 February 2017. "**UK is now on its last warning over pollution problems, but what is Trafford doing?**" Trafford has higher pollution rates than many parts of Manchester. News4Trafford have always been on Councillor's cases about the issue, but maybe now they will act, rather than just throw it under the carpet, hoping it will go away."

HealthyAir, 15 February 2017. "**A Clean Air Act for the 21st Century.**" HealthyAir says "we need a Clean Air Act that will: 1. Tackle the sources of modern air pollution, such as diesel, and accelerate the shift to zero emissions transport. 2. Improve and strengthen existing legislation, enshrining the right to breathe clean air into law, so the UK has the most ambitious air quality legislation in Europe. 3. Make the UK a World leader in clean technology, creating the jobs and industries that will help us and others to clean up our air."

University of Birmingham News, 29 April 2016: **“Exposure to particulate air pollutants associated with numerous cancers.”** The study between the University of Birmingham and University of Hong Kong “adds to growing concern around the health risks of prolonged exposure to ambient fine Particulate Matter. For every 10 microgram per cubic metre of increased exposure to PM_{2.5}, the risk of dying from any cancer rose by 22 percent.”

Journal of the Institute of Molecular Science 30 January 2017: **“Inhaled Pollutants: the molecular scene behind respiratory and systemic diseases associated with ultrafine Particulate Matter.”** This study says “Air pollution is a complex mixture that varies in space and time, and contains hundreds of compounds including volatile organic compounds (e.g. benzene), metals, sulphur, nitrogen dioxide, ozone and particulate matter (PM). Ultrafine particulates (PM_{0.1}) which have a diameter less than 100 nano-metres are considered especially dangerous to human health and may contribute significantly to the development of numerous respiratory and cardio-vascular diseases such as chronic obstructive pulmonary disease (COPD) and atherosclerosis.”

Parliamentary Environmental Audit Committee Report, 8 December 2014: **“Change planning rules to protect children from air pollution.”** Chairman Joan Walley MP says, “It is unacceptable that another generation of young people growing up in our towns and cities could have their health seriously impaired by illegal air pollution before the Government brings this public health crisis under control. Children growing up near busy roads with high nitrogen dioxide and particle emissions have stunted and impaired lung development. There is also emerging evidence that air pollution can increase infant mortality rates, prompt pre-term births and effect cognitive performance.”

The Guardian 2 March 2017: **“Stuttgart residents sue Mayor for bodily harm caused by air pollution.”** Reporter Prathap Nair says, “To highlight the dangerous air quality in the German city, which breached the EU limits 25 times in January, two neighbours lodged a criminal complaint against city officials. Popular resistance to Stuttgart’s pollution problem is growing.”

The Times, 3 March 2017: **“Air Pollution creates drug-resistant bugs.”** Science Correspondent Oliver Moody says “Scientists have discovered that tiny particles found in air pollution can significantly worsen infections and make it harder to treat with antibiotics. Grains of black carbon were found to help pneumonia and other respiratory diseases to spread into the lungs and grow into thick clumps to ward off antibiotics.”

Time Magazine, 3 March 2017: **“Volkswagen Emissions scandal – pollution could shorten thousands of lives.”** Charlotte Alter reports “Excess air pollution caused by the Volkswagen emissions cheat is on track to cause health problems that could shorten 1,200 lives in Europe, according to a new study out of MIT.”

The Guardian 3 March 2017: **“Traffic pollution must be fixed – our children’s lungs demand it.”** Penny Woods reports “Safe air pollution levels are being breached across Britain and children are the ones who are most vulnerable. Worryingly, this latest study drives home the extent to which their lung health is genuinely in danger.”

Environmental Health Perspectives, March 2017: **“The association between ambient fine particulate air pollution and lung cancer incidence.”** Lida Gharibvand et al study concludes “Increased risk estimates of Lung Cancer were observed for each 10ug/m³ increment in ambient PM_{2.5} concentration.”

Mail Online 3 March 2017: **“Black carbon in air pollution creates drug-resistant bugs and can worsen infections.”** The leading Scientist in the University of Leicester said “The four-year investigation focussed on how pollution in the air – thought to be responsible for millions of deaths each year – affects bacteria in the nose, throat and lungs of humans. The study found that black carbon, which is produced when diesel, biomass and biofuels are burned, changes the way bacteria grows.”

The Guardian 22 September 2015. **“The rise of diesel in Europe – the impact on health and pollution.”** Reporter John Vidal says “In a bid to reduce CO₂ emissions in the 90s, Europe backed a major switch from petrol to diesel cars, but the result was a rise in deadly air pollution.”

HealthDay News, 3 March 2017: **“Wood Stoves May Spark Heart Trouble.”** Scott Weichenthal, Professor at McGill University in Montreal says “Our study suggests that the source of pollution matters and that all particulate air pollution is perhaps not equally harmful when it comes to cardiovascular disease. Air pollution from wood-burning stoves raise the risk of heart attacks among older people living nearby.”

Science Daily, 27 February 2017: **“Woodstoves are good for the soul, bad for the heart.”** Researchers at McGill University say “The risk of acute myocardial infarction for the elderly living in and around small cities is increased by air pollution caused by biomass burning from woodstoves.”

Breathe Clean Air Comox Valley, 27 February 2017: **“Wood smoke increases heart attack risk in BC seniors.”** “A new health study of three communities in British Columbia found that rising concentrations of fine particulate air pollution caused by wood burning can significantly increase the risk of heart attacks in people 65 and older.”

Respro Bulletin Board, 27 February 2017: **“Air pollution exposure may increase risk of dementia.”** This report says “Our findings lead us to conclude that outdoor air pollution, in the form of tiny particles released from power plants and automobiles that seep into our lungs and blood, could nearly double the dementia risk in older women.”

Mail Online, 24 February 2017 **“Pure Idiocy! How spending billions on subsidising an efficient coal-burning power station to burn wood is actually WORSE for the planet than before.”** Christopher Booker writes “Britain’s mad energy policy is demonstrated more vividly than anything, just how far the politicians in charge had become lost on green make-believe that their behaviour amounted to collective insanity.”

Alternative Energy News, Sept 2008: **“Negative impacts of Incineration-based, Waste-to-Energy Technology”.** “Waste incineration systems produce a wide variety of pollutants which are detrimental to human health. Such systems are expensive and does not eliminate or adequately control the toxic emissions from chemically complex Municipal Solid Waste. Even new incinerators release toxic metals, dioxins and acid gases. Far from eliminating the need for landfill, waste incinerator systems produce toxic ash and other residues”.

BBC Science and Environment: 2 December 2016: **“Four Major Cities move to ban diesel vehicles by 2025.”** Matt McGrath reports, “The mayors of Paris, Mexico City, Madrid and Athens say they are implementing a ban to improve air quality. The use of diesel in transport has come under increasing scrutiny in recent years, as concerns about its impact on air quality have grown. The World Health Organization says that around 3 million deaths every year are linked to exposure to outdoor air pollution.”

Messenger Newspaper 17 January 2017. **“We want clean air – schoolchildren tell Stretford and Urmston MP.”** The reporter says that Kate Green MP, “recently met pupils from Victoria Park, Gorse Hill, St Monica’s and Davyhulme Primary Schools. In a lively discussion, the children listed their ideas on how to improve air quality and voted for their favourite – more electric cars and fewer diesel vehicles on the road. They wanted to see more parks and green spaces in the community and discussed different ways of getting to school which could help clean up the air.”

Sky News, 5 January 2017. **“Living near busy roads increases dementia risk, study finds.”** Dr Hong Chen from Public Health Ontario says “Increasing population growth and urbanisation has placed many people close to heavy traffic. People living within 50m of heavy traffic had a 7% higher risk of developing dementia compared to those whose homes were more than 300m away.”

The Guardian, 11 December 2016: **“Why logs are twice as dirty as diesel”** Experiments show that wood smoke contains shocking levels of harmful particles.”

Statement from the US National Resources Defense Council, 19 December 2016: **“European Commission grants Drax licence to destroy forests at public’s expense.”** Debbie Hammel, Director of the Land Markets Initiative at the NRDC said “Biomass power is dirty. It worsens climate change and it costs more than wind and solar. So why subsidise it? It makes no sense. It’s time for policy makers to recognise that there are cheaper, cleaner options for meeting the UK energy needs.”

BiofuelWatch, 10 December 2016, **“Burning wood in power stations.”** This report includes “Wood Dust exposure”. It says “Wood dust is a known carcinogen according to the WHO International Agency for Research on Cancer. Exposure is associated with a range of health risks, including skin disease, allergic and non-allergic respiratory problems such as asthma attacks and chronic bronchitis, as well as nasal problems. Most studies have looked at the health effects of workers in sawmills. However local residents in various places exposed to wood dust have reported similar health problems.”

BBC Science and Environment, 5 September 2016. **“Pollution Particles get into the brain.”** Research lead by scientists at Lancaster University analysed brain tissue samples from people living and dying in Manchester and Mexico City. Lead author Prof Barbara Maher said “It’s dreadfully shocking. When you study the tissue you see the tiny particles of magnetite distributed between the cells and when you do a magnetic extraction there are millions of particles in a single gram of brain tissue – that’s a million opportunities to do brain damage.”

The Guardian 2 November 2016, **“High Court Rules UK Government plans to tackle air pollution are illegal.”** Damian Carrington reports “The High Court rules for the second time in 18 months that the Government is not doing enough to combat the national air pollution crisis. Air pollution causes 50,000 deaths and £27.5bn in costs every year according to the Government’s own estimates and was called a public health emergency by MPs in April.”

Express, 24 October 2016: **“Suffering with a never-ending cough? It could be as a result of inhaling air pollution.”** A report produced by the Royal College of Physicians and the College of Paediatrics and Child Health says “air pollution can have a damaging effect from when a baby is in the womb and can continue throughout life to older age, playing a role in many chronic conditions such as cancer, asthma, heart disease and neurological changes linked to dementia.”

United Nations, 24 February 2017: **“Toxic Air Pollution: UN rights experts urge tighter rules to combat Invisible Threat.”** United Nations human rights experts are calling for strong, urgent action by States, including legislation and enforcement of corporate accountability, to try to ensure that people around the world can enjoy the human rights to life in environments free from contamination.”

JAMA Network Psychiatry (published online) 25 March 2015. **“Effects of prenatal exposure to air pollutants (Polycyclic Aromatic Hydrocarbons) on the development of brain, white matter, cognition and behaviour in later childhood.** Bradley S. Peterson et al concludes “Our findings suggest that prenatal exposure to PAH air pollutants contributes to slower processing speed, attention-deficit/ hyperactivity disorder symptoms and externalizing problems in urban youth by disrupting the development of left hemisphere white matter, whereas post natal PAH exposure contributes to additional disturbances in the development of white matter in dorsal prefrontal regions.”

Annals of Epidemiology, 11 December 2010: **“Biofuel smoke and Child Anemia in 29 developing Countries – a multilevel analysis.”** The authors conclude “Given the increasing number of people relying on biofuels in developing countries, policies and programs are necessary to protect children from being exposed to this harmful smoke at home.”

Polish Journal of Environmental Studies 6 December 2012: **“Effects of air pollution on Red Blood cells in children.”** The authors conclude, “We found that children exposed to higher levels of air pollution had an elevated prevalence of anaemia. The study provides support for the hypothesis that even exposure to low levels of environmental pollutants is hazardous to children’s health.”

J.Science magazine 20 January 2015: **“Air Pollution linked to brain disorders.”** Research at the University of Rochester Medical Centre, showed that mice exposed to airborne particulates during brain development had changes in brain structure consistent with those seen in autistic children.”

FoxNews.com, 18 February 2017: **“Air pollution exposure may increase risk of autism, schizophrenia.”** Dr Cory-Slechta, professor in the Department of Environmental Medicine at the University of Rochester School of Medicine says “The component people worry about the most are the smallest particles – the ultrafine

particles, and the reason is because those go all the way down into the bottom of the lung. Once they get there, they can be absorbed into the bloodstream.”

BioMed Research International, 17 February 2014: **“Neurotoxicants are in the air: Convergence of human, animal and in-vitro studies on the effects of air pollution on the brain.”** Lucio G. Costa et al state “In addition to increased morbidity and mortality caused by respiratory and cardiovascular disease, air pollution may negatively affect the brain and contribute to central nervous system diseases.”

PLOS ONE, 16 October 2013: **“Effects of ambient particulate matter on human breast cancer: Is xenogenesis responsible?”** QiangHuo et al conclude, “Our findings and clinical data indicate that long-term air pollution exposure may contribute to the development of breast cancer by playing the role of xenoestrogen and also provide new insight into the association between air pollution and the morbidity and mortality of breast cancer patients.”

Fox13 News, 13 January 2015: **“Bad Air Impacts Health, New Research Shows.”** Researchers at the University of Utah found in a recent study that a strong correlation exists between exposure to particulate pollution and visits to the Emergency Room for pneumonia. In another study, doctors and researchers found poor air quality causes inflammation to not only the lungs, but the entire cardiovascular system.”

Science Daily, 4 October 2014: **“High Pollution Days Linked to Increased Risk of Cardiac Arrest.”** A Japanese study found that rates of out-of-hospital cardiac arrest are elevated after days with high levels of air pollution. For example, 48 to 72 hours after days with high levels of particulate air pollution, the risk of out-of-hospital cardiac arrest increased by 17 per cent.”

Los Angeles Times, 25 March 2015: **“Air Pollution Takes a Double Toll on Babies’ Brains.”** Dr Bradley Peterson, Director of the Institute for the Developing Mind at Los Angeles Children’s Hospital said, “In 40 children examined by researchers, pre-natal exposure to polycyclic aromatic hydrocarbons was correlated with reduced white matter on the left side of children’s brains during their early childhood. These physical changes in the brain’s internal wiring also were correlated with slower cognitive processing and with symptoms of attention deficit and hyper activity. They tended to be fidgety and hyperactive and very impulsive, so they leap before they look.”

EurekAlert, 15 November 2014: **“Air Pollution Associated with Higher Rates of Chronic Kidney Disease.”** The American Society of Nephrology states “Air pollution may play a role in the development of kidney disease. There are wide variances in the prevalence of Chronic Kidney Disease (CKD) across the United States, only part of which is explained by differences in individuals’ risk factors. A wide study of 1.1 million persons as well as air quality data for all US counties found a link between the prevalence of CKD and the county level of Particulate Matter.”

Government of British Columbia, 4 February 2015: **“BC Air Quality Affects Health.”** The BC Government website states, “A 2002-3 BC Lung Association study of air quality in the Lower Fraser Valley found that even low amounts of PM2.5 in the air can harm our health. In fact the study pointed out that a safe level of PM2.5, (below which there are no health impacts) has not been found. As PM2.5 increases, so do the health problems. Long-term exposure to PM2.5 is an added health hazard.”

Minnesota Pollution Control Agency, 11 April 2012: **“Health Effects of Wood Smoke.”** This article states, “Wood smoke contains a hazardous mixture of chemical substances such as carbon monoxide (CO), nitrogen oxides (NOx), volatile organic compounds (VOCs), dioxin and inhalable particulate Matter (PM). Some of the VOCs are irritating, toxic, and/or cancer causing. One of the biggest human health threats from smoke, indoors or outdoors, comes from Particulate Matter. Wood smoke PM is composed of wood tars, gases, soot and ashes. Toxic air pollutants are another potentially important component of wood smoke. A group of air toxins known as PAHs include potential carcinogens such as benzo(a)pyrene.”

The National Institute of Environmental Health Sciences, 22 June 2011: **“Prenatal PAH Exposure Lowers IQ.”** “New findings from a Columbia University study conducted in Krakow, Poland show that prenatal exposure to polycyclic aromatic hydrocarbons reduces IQ in children at five years of age. The median prenatal exposure of

PAHs was 17.96 nanograms per cubic metre of air. Children exposed to higher levels had an average decrease in IQ of 3.8 points.

PubMed 2008: "**Oxidative damaged DNA and its repair after experimental exposure to wood smoke in healthy humans.**" P H Dalielson et al says, "Particulate Matter from wood smoke may cause health effects through generation of oxidative stress with resulting damaged to DNA."

Environmental Health Perspectives, March 2015: "**Autism Spectrum Disorder and Particulate Matter Air Pollution, during and after Pregnancy.**" Raanan Raz et al concludes "Higher maternal exposure to PM2.5 during pregnancy, particularly the third trimester, was associated with greater odds of a child having Autism Spectrum Disorder."

Utah Physicians for a Healthy Environment, 27 February 2017: "**Births Outcomes.**" Six doctors from UPHE with expertise in the effects of air pollution on pregnancy said "Air pollution causes morphological changes in the placenta, narrowing blood vessels, and inhibiting blood transfer to the foetus."