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This report is intended for a wide variety of readers with varying levels of knowledge and understanding of the subject matter. Accordingly, complex technical, scientific and legal issues are described in Plain English and with appropriate background information and/or references wherever possible. Readers NOT understanding any term or concept are invited to contact <David Baxendale> on <tel. 01827 719322 or Email davidbaxendale@northwarks.gov.uk> for further clarification. Translation services will be sought on reasonable request. This report and several background papers are being made available also through the Councils website, at <http://www.northwarks.gov.uk>

List of abbreviations and acronyms

AQAP	Air Quality Action Plan
AQDD	Air Quality Daughter Directive(s)
AQFD	Air Quality Framework Directive
AQMA	Air Quality Management Area
AQO	Air Quality Objective
AQS	Air Quality Strategy
BNRR	Birmingham Northern Relief Road (M6Toll)
CBA	Cost Benefit Analysis
CNG	Compressed Natural Gas
CPO	Compulsory Purchase Order
DEFRA	Department of the Environment, Food and Rural Affairs
DETR	Department of the Environment, Transport and the Regions
DTLR/ODPM	Department of Transport, Local Government and the Regions (split 2002 with non transport functions going to the Office of the Deputy Prime Minister)
EA	Environment Agency
EPAQS	Expert Panel on Air Quality Standards
GTP/STP	Green (or School) Transport/Travel Plan
HA	Highways Agency
HOVL	High Occupancy Vehicle Lane
LAQM	Local Air Quality Management
LEV/ZEV	Low (Zero) Emission Vehicle
LPG	Liquefied Petroleum Gas
LTP	Local Transport Plan
NO	Nitrogen Oxide
NO ₂	Nitrogen Dioxide
NO _x	Oxides of Nitrogen
NSCA	National Society for Clean Air (and environmental protection)
NWBC	North Warwickshire Borough Council
P&R	Park and Ride
ppb	Parts per billion
PPG	Planning Policy Guidance (note)
RTRA	Road Traffic Reduction Act 1997
SCA	Supplementary Credit Approval
UK	United Kingdom
VED	Vehicle Excise Duty
WCC	Warwickshire County Council
WHO	World Health Organisation

Executive Summary

Predictions suggest that in the year 2005, air quality in one small part of North Warwickshire affecting one house may be above national objectives for exposure to nitrogen dioxide. This draft plan puts that prediction into context. It then explores several possible initiatives and proposals to validate the conclusion and to mitigate the effects of air pollution arising primarily from road traffic on the trunk road network. Proposals are grouped according to the theme under which they were developed, being related to improving **data**, dealing with the **receptor** of air pollution, its **pathway** and its **sources**.

The Plan is as follows;

- A1: Introduce new or clarified policies into [draft] Local Plan or as Supplementary Planning Guidance (Local Policy) for the purposes as stated at Theme A.**
- A2: Explore re-use of the affected dwelling in ways which do not conflict with the air quality objective, voluntarily at first and then compulsorily as required.**
- A3: Explore alternatives and initiatives with the landlords agent to prevent re-occupation of the dwelling if it falls naturally vacant before other measures take effect.**
- B1: Form a project group to develop further and in detail a planting regime as indicated as Theme B which meets or contributes to achieving the air quality objective.**
- B2: Maintain awareness of developments in denitrification systems as described above, for a future decision on the value of a detailed project specification in due course.**
- B3: Prepare to form a project group to develop further and in detail a scheme of works to the affected dwelling as described at Theme B which introduce de-polluted air under positive pressure and improve *internal* ambient air quality. ** *only if/when other measures appear insufficient***
- C1: Request the Highways Agency and Warwickshire County Council to maintain awareness of the air quality issue and report back from time to time on measures and matters which may impact upon it.**
- C2: Develop the NWBC Green Travel Plan [GTP], commencing with an audit of the Council's fleet and wider operational traffic impacts. On completion and implementation of the GTP, promote GTP's and School Travel Plans to a wider audience, focusing on the Coleshill area.**
- C3: Lobby on the issues described under Theme C and others as they arise, with the approval of the appropriate NWBC forum.**

Four further 'proposals' relating to improved data were put forward, but are not part of the 'plan' as they do not directly improve air quality themselves, just the understanding of it. Accordingly, whilst they support the above proposals, DEFRA have advised that they are acknowledged as separate and different from the main Plan proposals.

- **Continue to gather air quality monitoring data from around and within the AQMA by diffusion tubes and real-time chemiluminescent monitoring as appropriate.**
- **Review quality control and quality assurance processes to ensure that gathered data fully meets the criteria for its intended uses.**
- **Obtain finalised road system layout for use within air pollution dispersion model.**
- **Re-run computer simulation model with updated air quality and road system data as required to better inform control scenarios.**

1.0 Introduction

1.1 Background: The Environment Act 1995 introduced initiatives for the protection of local air quality in the UK. One major initiative was the development of a National Air Quality Strategyⁱ. This was issued in 1997, then revised and re-issued in 2000 by the Secretary of State for the Environment. Further information is available from the Department of the Environment, Food and Rural Affairs [DEFRA]ⁱⁱ or the Council. Another major initiative within the Act was a requirement on local Councils to review and assess air quality in their areas in respect of seven key air pollutants, those being;

- Nitrogen dioxide [NO₂]
- Sulphur dioxide [SO₂]
- Carbon monoxide [CO]
- Lead [Pb]
- Benzene [C₆H₆]
- 1,3-Butadiene
- particulates (PM₁₀ - with an average diameter of less than 10 microns)

This process is known as Local Air Quality Management [LAQM]. Councils undertook studies ranging from simple listing and screening exercises to complex monitoring and computer modelling of future air quality. Their aim was to determine the likelihood of any Air Quality Objective [Figure 1] being exceeded in a relevant location by specific dates. Councils were and continue to be supported in their work by ongoing research and guidance from central government and other agencies. The Air Quality Objectives were set by Regulationsⁱⁱⁱ, with Councils required to work in pursuit of them but not obliged to achieve them. This system is set in the context of wider European attention to ambient air quality as described in the Air Quality Framework Directive [AQFD] and subsequent Daughter Directives [AQDD's]^{iv}

1.2 North Warwickshire Borough Council – Progress

- 1.2.1 North Warwickshire Borough Council undertook the required review and assessment process initially with the assistance of appointed consultants, the results of which have been reported to its Environment and Health Committee, in addition to statutory and non statutory consultees.
- 1.2.2 The early screening stages 1 and 2 of the process suggested further consideration was required for potential high levels of nitrogen dioxide and particulates. A more extensive stage 3 monitoring and modelling exercise concluded that the annual

average nitrogen dioxide objective of 40 micrograms per cubic metre [or 21 parts per billion – ppb] was likely to be exceeded at one relevant property near to Coleshill, in a position close to several major trunk roads. The maps at figures 2, 3 and 4 show the position of the property in relation to its surroundings and the wider road network.

Figure 1 - Summary of objectives of the UK Air Quality Strategy

Objectives for air pollution are concentrations over a given time period that are considered to be acceptable in the light of what is known about the effects of each pollutant on health and on the environment. They can also be used as a benchmark to see if air pollution is getting better or worse.

The objectives adopted in the UK are part of the Air Quality Strategy published by the Government in January 2000.

Pollutant	Objectives	measured as	To be achieved by
Benzene	16.25µg/m ³ (5ppb)	running annual mean	31 December 2003
1,3-Butadiene	2.25µg/m ³ (1ppb)	running annual mean	31 December 2003
Carbon monoxide	10 mg/m ³	maximum daily 8 hour mean	31 December 2003
Lead	0.5 µg/m ³	annual mean	31 December 2004
	0.25 µg/m ³	annual mean	31 December 2008
Nitrogen dioxide*	200µg/m³ (105ppb), not to be exceeded more than 18 times a year	1 hour mean	31 December 2005
	40µg/m³ (21ppb)	annual mean	31 December 2005
Particles (PM10)	50µg/m ³ , not to be exceeded more than 35 times a year	24-hour mean	31 December 2004
	40µg/m ³	annual mean	31 December 2004
Sulphur dioxide	266µg/m ³ (100ppb), not to be exceeded more than 35 times a year	15 minute mean	31 December 2005
	350µg/m ³ (132ppb), not to be exceeded more than 24 times a year	1 hour mean	31 December 2004
	125µg/m ³ (47ppb), not to be exceeded more than 3 times a year	24 hour mean	31 December 2004

ppm = parts per million; ppb = parts per billion; µg/m³ = microgrammes per cubic metre; mg/m³ = milligrammes per cubic metre

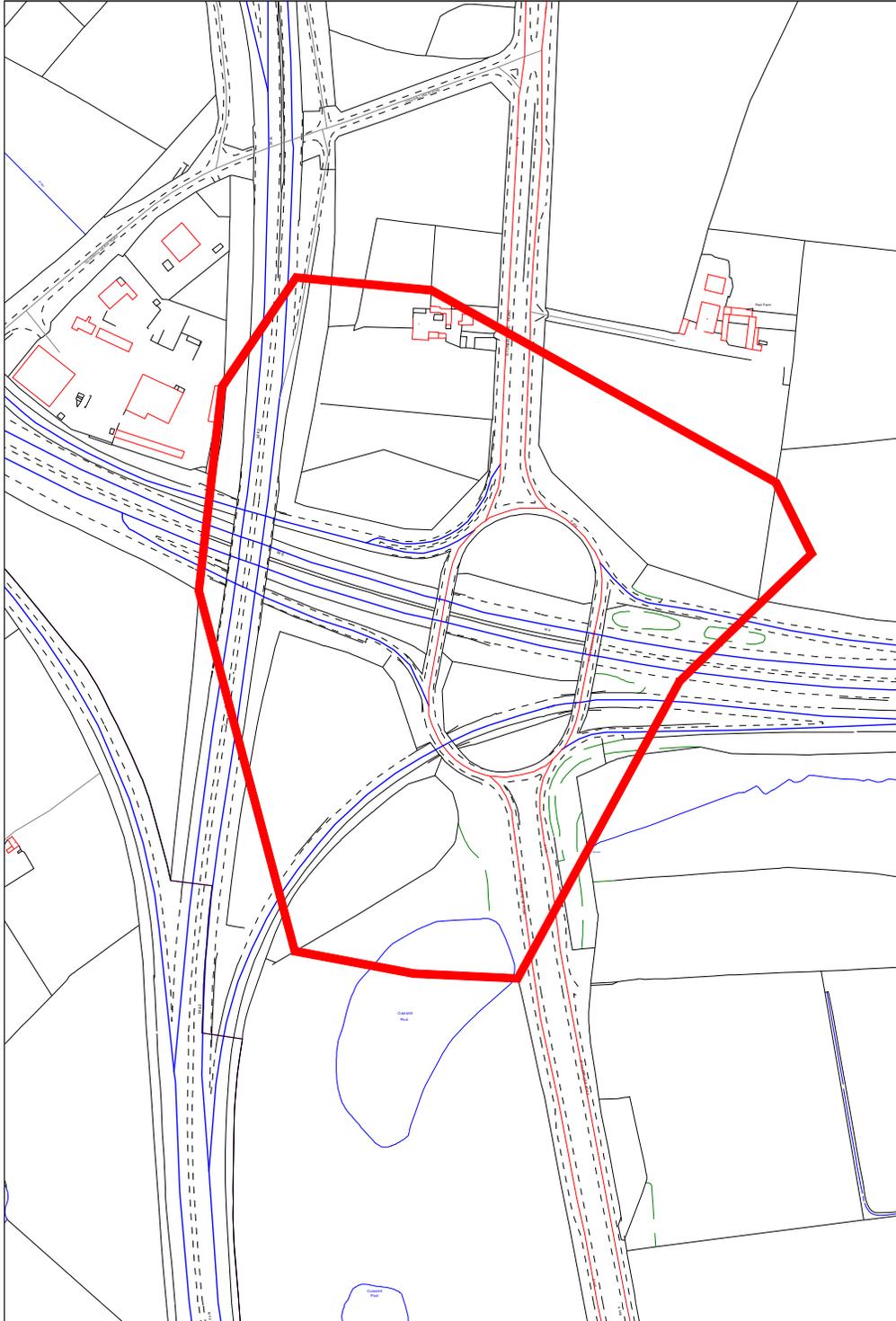
***The objectives for nitrogen dioxide are provisional**

1.2.3 The Council was therefore obliged to designate the site as an Air Quality Management Area, and did so by an official Order which became effective on 1st March 2001.

1.2.4 A further 'stage 4' evaluation had then to be undertaken within 12 months to check and refine the knowledge on the issue, which resulted in confirmation of the earlier

Figure 2 – Map: Stonebridge AQMA

Stonebridge Air Quality Management Area



**North Warwickshire
Borough Council**
PO Box No.6, The Council House,
South Street, Atherstone,
Warwickshire, CV9 1BG.

Scale 1:5000

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findings. However, it acknowledges the considerable uncertainties in the accuracy of computer modelling and of some input data, especially traffic details, in the context of a very marginal predicted exceedence. The conclusions and recommendations of that stage 4 work were;

- to continue with the ongoing extensive real-time air quality monitoring, relocating key equipment from adjacent to the affected area to within it if possible, up to and including 2005,
- to seek better traffic data, specifically following the opening of the M6(Toll), with which to re-model the scenarios,
- to keep the designated air quality management area in its current form, and
- to continue ongoing work with partners and stakeholders to develop the statutory Air Quality Action Plan, of which this is the first draft.

What that work did not acknowledge was that a whole second phase of review and assessment is to be carried out nation-wide during 2003/4, which will further inform what is happening in North Warwickshire. This is a continually evolving process and in the future air quality will be assessed via an updating and screening phase every three years, further detailed assessment when necessary, and annual progress reporting. Existing Air Quality Management Areas can be revoked or new ones declared based on these further assessments. If a new Air Quality Management Area is declared an Action Plan will have to be formulated accordingly. Depending upon the findings of the initial updating and screening assessment more work may be required e.g. if improved traffic data shows that there has been a significant change to flows on particular roads then further modelling will be needed to assess the impact upon air quality. Further monitoring would also be needed in the vicinity of these roads in order to validate the findings of the modelling. Technical guidance is adhered to and advice is sought from various government publications and helpdesks so that the program of monitoring and modelling is appropriate for each particular source.

- 1.2.5 The following plan represents the outcome of extensive consideration of potential measures which may enable compliance with the air quality objective in 2005 or thereafter. However, alterations to factors which predict vehicle emissions, together with other emerging policies and knowledge may result in the designated AQMA being increased in size, or revoked, or that other pollutants such as fine particulate matter may become a concern, or that additional AQMA's may require designation in due course. This plan therefore aims to be ambitious but pragmatic, flexible and

proportionate in relation to the confidence in the mechanisms and data which triggered its preparation.

1.3 Area overview – North Warwickshire

- 1.3.1 North Warwickshire is the rural area lying between Birmingham, Solihull, Coventry, Nuneaton and Tamworth. It has a population of approximately 60,000, spread across a number of towns and villages. Atherstone and Coleshill are the main towns, and there are several large villages, including Polesworth, Kingsbury and Water Orton. At the other extreme, there are small hamlets of only a few houses. Many of the settlements in the northern part of the Borough developed from small villages to provide homes for workers in the mining industry, but only one coal pit remains at Daw Mill near Arley. In contrast, the towns and villages on the western side of the Borough grew to meet the demand for homes for commuters into Birmingham and other large centres. Over the past 20 to 30 years there have been radical changes in the employment base of the Borough with new industrial estates, including the Hams Hall freight terminal and hotel and leisure developments. North Warwickshire is now the home of major companies including TNT, BMW, Aldi and British Home Stores. The Public sector is also a significant employer in local government, health, education and social services.
- 1.3.2 Despite some large developments, North Warwickshire remains overwhelmingly rural in character. There is no main centre, many residents having to look to the surrounding cities and towns for jobs, health provision, shopping and other services. The Borough's transport infrastructure includes the M6 and M42 motorways (with the M6(Toll) under construction), several trunk roads and A roads (A5, A38, A45, A47, A51, A444, A446, A453 and A4091) in addition to the minor road network. It also has two railway lines (West Coast Mainline and Birmingham to Tamworth/Nuneaton), with stations at Atherstone, Polesworth and Water Orton, plus two canals (Birmingham & Fazeley and Coventry). It is adjacent also to the Birmingham International Airport and close to East Midlands airport. The population characteristics, employment, leisure and shopping facilities combined with limited public transport provision as viable alternatives to the private car combine to make car ownership and use highly important to many.
- 1.4 Strategic context:** The Air Quality Action Plan has been framed in the context of both national guidance and practise elsewhere, but from a local perspective has acknowledged the following;

- North Warwickshire's Community Plan [specifically pages 14-16] and Best Value
- Draft Regional Planning Guidance [RPG], the West Midlands Multi-modal Area Study [WMMMAS] and relevant Government planning guidance [PPG's 13 on Transport and 23 on Pollution]
- the Warwickshire County Structure Plan [WASP] – specifically environment policy ER1
- the North Warwickshire Local Plan [adopted 1995, first deposit draft of new plan *due* November 2002] – specifically relevant chapters on environment and transport policy, and in particular *draft* policy ENV13 on air quality and stewardship
- the Local Transport Plan [LTP] for Warwickshire – and annual updates

1.5 Nitrogen Dioxide – an overview

1.5.1 **Chemistry:** Combustion processes in air produce oxides of nitrogen. Most is in the form of nitric oxide [NO], which collectively with nitrogen dioxide [NO₂] are commonly referred to as NO_x. In the presence of oxidising agents such as ozone, nitric oxide can be converted into nitrogen dioxide and subsequently also into nitric acid [H₂NO₃]. The level of nitrogen dioxide in ambient air is therefore a complex function of the emission rate of nitric oxide, its oxidation to NO₂ and the further conversion of NO₂ to other species. The presence and amount of ultraviolet light (daylight) may also enhance or inhibit certain reactions. The level of NO₂ at any particular point is further affected by meteorology (weather) affecting dispersion and deposition. The levels of NO_x and NO₂ are observed to decline rapidly with increasing distance from the kerbside of road sources, falling near to ambient levels within as little as 30 metres under some conditions. However, where levels of NO_x are sufficiently high, the conversion of NO_x to NO₂ is not limited by NO_x but by other factors such as the availability of oxidants e.g. ozone. Therefore, large reductions in NO_x emissions may result in only a small impact on ambient NO₂ levels. This is exacerbated where air moving in from other congested or densely populated areas may already be saturated with NO_x or have high background levels of NO₂.

1.5.2 **Measurement:** There are several methods for measuring the concentration of NO₂ in air. The two most common are;

- diffusion tubes [passive plastic or glass tubes deployed for weekly or monthly averages, inexpensive but not highly accurate], and

- chemiluminescence, where the emission of light of particular wavelengths provides the concentration of NO_x and NO, from which NO₂ is deduced. This latter method is more accurate and produces continuous point measurements which can demonstrate short time averages and peaks, but is significantly more expensive. The acknowledged EU reference method for the analysis of nitrogen dioxide and oxides of nitrogen in ambient air is ISO 7996:1985 for chemiluminescence, or any demonstrable equivalent. North Warwickshire Borough Council currently uses both methods.

1.5.3 **Limitations:** Whilst measurements can demonstrate current air quality, to a degree, they cannot alone demonstrate future air quality which is necessary for strategic planning and ambient air quality management. Other tools, including emissions inventories and computer models of a variety of sophistication, are required to predict future air quality and inform the processes for its control. Just as measurement devices have their limitations and degree of accuracy, so too do those computer models which rely on input data such as the volume, speed and composition of traffic, the proportion of differently fuelled vehicles of various ages, the impact of planned and unplanned developments, economic indicators and patterns of employment.

1.5.4 **Health:** Breathing NO₂ can affect lung function and airway responsiveness temporarily, and may increase a body's reactions to natural allergens [asthma]. Repeated exposure can have more permanent effects on lung structure and metabolism and resistance to bacterial infection. Guidelines and standards in respect of ambient NO₂ exposure from the World Health Organisation [WHO], European Union [EU] and Expert Panel on Air Quality Standards [EPAQS] therefore recognise the potential acute and chronic nature of exposure to different concentrations for different periods. In addition to effects on human and animal health, ongoing work seeks to quantify the potential threat to vegetation, ecosystems and built structures in addition to the recognised harm from acid rain deposition and eutrophication (soil acidification). NO₂ is also implicated and involved in the formation of secondary particulates and the reformation of ozone.

As the effects on human health can be temporarily or permanently debilitating, resulting in behaviour and activity change, work loss, medical treatment and in extreme cases death there is a considerable financial element to its effect. This financial element contributes to a broader cost-benefit analysis (CBA) relating to the

control of nitrogen dioxide, as for other pollutants and risks. Ongoing work to quantify those costs and benefits in monetary terms by the Interdepartmental Group on Costs and Benefits [IGCB] has yet to conclusively report. However, addressing exposure to ambient NO₂ is a legitimate and significant objective for the protection of human health and the wider environment.

1.5.5 **Sources:** The most significant emission sources of NO_x in the United Kingdom are from road transport and the electricity supply industry. Road transport is believed to account for approximately 50% or more of NO_x in the UK, with electricity generation contributing 20% and commercial/industrial sectors 17% [these figures differ geographically depending on the predominant local source, i.e. road transport in London is credited with producing over 75% of its NO_x]. As such, in positions where road traffic heavily dominates NO_x production, clear patterns can be seen which follow the geography of the roads and junctions, and through the day or week to coincide with travelling behaviour. Patterns show a higher density of pollutants closer to roads and daily/weekly logs show the typical morning/evening rush-hour peaks, with lower levels overnight and at weekends.

UK annual emissions of NO_x have fallen sharply with a reduction of over 31% in the past decade, due mainly to the two major sectors. Transport policy is projected to progressively reduce NO_x emissions further from the traffic sector over the next 10-15 years, thereafter being offset by a growth in traffic mileage and the effects of vehicular congestion to reverse the downward trend. Improvements in fuel quality, fuel efficiency, fuel choice [Liquefied Petroleum Gas [LPG], Compressed Natural Gas [CNG], electric/hybrid, hydrogen fuel cell] and emissions abatement are all expected to contribute.

2.0 The Action Planning Process

- 2.1 Guidance from central Government and non statutory guidance from the National Society for Clean Air recommends that the action planning process is inclusive and based on consensus (agreement), as many control measures will require the co-operation of others and will impact on residents, businesses and wider communities. An action plan which is imposed upon an uninformed and resistant audience will be harder to implement or get political approval for.
- 2.2 North Warwickshire Borough Council has not only kept statutory consultees informed throughout the processes, as it is required to do, but has sought to inform the public and many potential stakeholders in addition to engaging their views and answering questions and concerns.
- 2.3 Internal consultation and collaboration within the Borough Council has been undertaken by the provision of information and inclusion of staff from a wide range of specialism's, including; land use and forward planning, economic development, sustainability, leisure, finance, legal and transport. Numerous meetings and briefings were undertaken in addition to providing extensive information via reports to Committee/Board and directly to key staff electronically. Reports to Committee/Board also informed and invited input from elected members and through them and the media their constituents.
- 2.4 Statutory external consultation included the following;
- the Secretary of State for the Environment [via DEFRA]
 - the Environment Agency [EA]
 - the Highways Agency [HA]
 - Warwickshire County Council [WCC]
 - adjacent local authorities contiguous with the AQMA [Solihull MBC]

Officers of both the County Council and Highways Agency have been closely involved with meetings of the core working group in the development and evaluation of action plan measures. The Environment Agency has been sent information as required, but as the air quality problem is not related to any industrial processes authorised or regulated by them their role has not been developed further. DEFRA have provided feedback on each stage of the review and assessment submitted to them, and the latest observations on the stage 4 report are acknowledged and

incorporated into this draft plan. Solihull MBC have replied to the stage 4 consultation by acknowledgement, but have not provided additional information significant or relevant to the plan.

2.5 Non statutory external consultation and stakeholder involvement has been sought by both general press releases and specific targeted mailing to the following;

- Warwickshire Police
- Coleshill Town Council
- Coleshill Civic Society
- Residents of the affected farmhouse
- Agents for the owner of the affected farmhouse
- The Environmental Transport Association
- The Chartered Institute of Environmental Health

Coleshill Civic Society have been involved in several meetings of the core working group. The residents of the affected property have been met and corresponded with, as have the agents for the property owner. Key reports are in the process of being posted on the Council's website at www.northwarks.gov.uk/.

2.6 The action planning process was mainly undertaken by a series of meetings with a core group, between which members provided each other with the results of their work. Some meetings took place at the offices of North Warwickshire Borough Council, with others occurring at the Coleshill Heath Road depot of Warwickshire County Council, immediately adjacent to the AQMA and from which visits took place to the affected property and the Council's monitoring equipment.

2.7 The series of meetings commenced with introductions and bringing all present up to date with the process and its background, together with the responsibilities and powers of the partners involved. It was agreed to identify a comprehensive initial list of potential measures which may contribute to resolving the predicted air quality objective exceedence, from which a basic screening would remove those clearly not deserving of further evaluation. The remaining measures (though the list was never 'closed' and new measures could be introduced at any time) were subjected to a more thorough and detailed evaluation based on criteria as indicated at appendix A, the intention being to build upon a basic Cost Benefit Analysis approach with socio-environmental factors. Not all measures were evaluated by each partner, the list effectively being divided between the Highways Agency, Warwickshire County

Council (as Highways Authority) and North Warwickshire Borough Council. Clearly, measures directly affecting or relating to the trunk road network were considered by the HA, measures relating to transport planning and the Local Transport Plan [LTP] process by WCC, and other measures by the Borough Council. Some measures had multi-agency implications and were debated further during group meetings. AQAP guidance says that measures should be justifiable, cost effective and proportionate.

- 2.8 The stage 4 review and assessment work confirmed that the projected exceedence was marginal [perhaps within 1 ppb or 2 microgramme/m³ of the 21ppb / 40ug/m³ standards] with considerable uncertainty over traffic data inputs and inherent modelling accuracy. It confirmed also that the vast majority of emissions of oxides of nitrogen [NO_x] which form nitrogen dioxide [NO₂] were from motor vehicles on trunk roads, and that they represented the only feasible source from which to seek reductions. It is acknowledged, also, that reductions in NO_x will probably not result in equal reductions in ambient NO₂, as the chemical formation reaction is complex and there may be such an oversupply of oxides of nitrogen such that it is not the limiting factor in the creation of nitrogen dioxide. This would mean that either large NO_x reductions would be required for modest NO₂ gains, or another factor in the chemistry could (if feasible) be targeted. Whilst emissions from motor vehicles continue to decline slowly as older and less efficient vehicles are replaced, this is offset by the growth in road traffic generally. The prevailing weather patterns also mean that much of the air within the AQMA comes from the urbanised West Midlands, with all of its inherent pollution.
- 2.9 Further work acknowledges the role of the trunk road network in providing an efficient national transport system, particularly for long distance and through traffic moreso than local commuter journeys. As many as 250,000 vehicles per day transit this small area at the hub of the network which contributes to the local, regional and national economies. Accordingly, measures to significantly reduce traffic on trunk roads are expected to be both difficult and costly to implement in addition to being uncertain in their outcome. This is in the context of the (currently under construction) M6(Toll) or Birmingham Northern Relief Road which is a £500-750 million project to relieve congestion on this part of the midlands trunk road network. Greater prospects of success may therefore arise from addressing the emissions from traffic by vehicle type and how they are driven, rather than just by targeting a reduction in numbers of vehicles being driven. Also, measures which address the pathways

between roads and the property in addition to the property as a receptor may ultimately become the only viable and certain options for success.

2.10 As the knowledge and understanding of the group developed during the process, **four themes** for an action plan became apparent;

- to obtain better data on air quality and traffic in order to better inform further computer modelling which would assist in focusing and evaluating control measure scenarios,
- measures to address the RECEPTOR of the pollution i.e. the affected dwelling,
- measures to address the potential PATHWAYS between the emissions sources and the receptor,
- measures to address the SOURCES of emissions, those being vehicles, the roads and relevant junctions.

At the suggestion of DEFRA, the first 'theme', DATA, is treated as a distinct section and more fully describes ongoing and future work on reviews and assessments of air quality.

2.11 The likelihood of exposure to pollution is commonly described in the form of a relationship between the SOURCES of pollution, and the PATHWAYS between those sources and RECEPTORS (those who would be affected).

Whilst it is preferable to deal first with the sources of pollution and last with the receptors, the particular circumstances of this air quality issue turn that formula around.

3.0 Developing Better Data

- 3.1 The four phases of review and assessment conducted to date have utilised air quality data from local, regional and national resources in the form of measured values, background / modelled values and emissions inventory information. Clearly, the best data to use is current real time air quality monitoring from within the AQMA. The best data to use for the year 2005 will be data measured in the area during 2005. Quality assurance and quality control (QA/QC) measures are critical in ensuring the value of the data gathered, and the products of its eventual use.
- 3.2 At the commencement of the process, local data was obtained from diffusion tubes for oxides of nitrogen and surrogate data from surrounding sites in the national network [AURN]. Subsequently the Borough Council's NO_x tubes have been increased in number and focused on the area of concern. For stage 3 the tubes were supplemented by temporarily hired in real-time monitors through the consultants assisting at that stage of the process. For stage 4 the Council was able to purchase, through a funding route called a Supplementary Credit Approval [SCA], its own real time monitoring station which was situated at the Coleshill Heath Road depot of the Highways Department of Warwickshire County Council since May 2001.
- 3.3 The results obtained from this monitoring station from May 2001 to the end of April 2002 show an annual mean for nitrogen dioxide of 24.5 parts per billion (ppb). If this data is converted to an estimate for 2005 (following the guidance document TG4(00)) the result is a figure of 22.2 ppb. Based on this the annual mean objective for nitrogen dioxide may be exceeded at this site in 2005. The levels of particulate matter (PM₁₀) and sulphur dioxide are well below their respective objectives for 2005. The monitoring data and daily calibration results are checked and validated every working day, where possible. A QA/QC review is also undertaken by an engineer every 6 months as part of regular service and maintenance. The network of nitrogen dioxide diffusion tube monitoring sites was also expanded in 2001 in and around the air quality management area. This wider expansion of monitoring showed that if the recorded NO₂ annual mean from each site is converted to estimates for 2005 (guidance provides conversion factors), they all fall below the objective, with the exception of one site directly adjacent to the M6.
- 3.4 The air quality modelling package (computer software), called AAQuIRE 2000, combines models for vehicular and fixed [point source] pollutants. Currently AAQuIRE uses the CALINE4 model for the dispersion of road-traffic emissions and

AERMOD for all other sources. Both of these models are fully validated and have been extensively used world-wide. These are relatively complex models designed for detailed studies of local areas, which are used within AAQuIRE for both local and larger scale studies. This is considered necessary because of the frequent importance of local factors, such as traffic junctions, in properly assessing “regional” effects. Both models are classified as ‘advanced’ in DETR [now DEFRA] guidance note LAQM.TG3(00). The model utilised 1993 meteorological data from the nearby Birmingham International Airport as a typical weather year.

- 3.5 The model also required data files on the road system layout and associated traffic for the vicinity. The road system layout is undergoing massive change, with the construction of the M6(Toll), but whilst the route of that new highway is known and fixed, the layout of the A446 dual carriageway and a key junction immediately adjacent to the affected dwelling are not. In order to incorporate the construction of a new bridge for the A446 to travel over the M6(Toll), the line of the A446 has been temporarily shifted and a roundabout placed at its junction with Coleshill Heath Road. Discussions have taken place between the HA, WCC and landowner to determine if the A446 will return to its original path, or remain in a different position and with a roundabout instead of its original T-junction. Those discussions have only just concluded, and the temporary roundabout is to be retained. This may significantly affect highway efficiency and will have to be closely observed following completion of the A446/BNRR bridge link to the north of it. With this issue still ‘developing’, no model can accurately calculate likely future emissions on an assumed road layout. Information on the construction of the new motorway can be viewed at <http://www.bnrr.co.uk>. It is also now likely that following the opening of the BNRR, the A446 at this location will be de-trunked and management of it would pass from the Highways Agency to the County Council as Highways Authority.
- 3.6 From the best available data on traffic numbers, speeds and fleet composition it may be possible to indicate the relative contribution to the AQMA from each road, permitting control measures to focus on the major sources of emissions for the best gains.
- 3.7 Traffic data provided for the original model calculations was provided by the Highways Agency and estimated traffic flows for the M6(Toll) were taken from public enquiry data. This traffic data was however rather limited. In order to provide greater accuracy and certainty about the future emissions from vehicles, the following data is

considered essential for all roads; traffic flow, speed, HGV%, vehicle types, and profiles of diurnal and seasonal patterns.

3.8 The conclusions to this section on data generated four proposed actions;

- **Continue to gather air quality monitoring data from around and within the AQMA by diffusion tubes and real-time chemiluminescent monitoring as appropriate.**
- **Review quality control and quality assurance processes to ensure that gathered data fully meets the criteria for its intended uses.**
- **Obtain finalised road system layout for use within air pollution dispersion model.**
- **Re-run computer simulation model with updated air quality and road system data as required to better inform control scenarios.**

4.0 Theme |A: The Receptor

- 4.1 Guidance requires consideration of the likely exposure of receptors to certain levels of air pollution for relevant periods. For the annual average exposure to nitrogen dioxide, it defines the relevant receptors as being;
“Building facades of residential properties, schools, hospitals, libraries etc.”. It specifically EXCLUDES “building facades of offices or other places of work where members of the public do not have regular access, gardens of residential properties, kerbside sites or any other location where public exposure is expected to be short term”.
- 4.2 It is debatable whether the residents of the affected dwelling are likely to be exposed to levels of nitrogen dioxide above the objective at 31.12.2005 as it would relate to their personal circumstances, work and leisure habits. However, strictly following the letter of the guidance the Council was required to designate the AQMA and has proceeded on that basis since. The objective as stated in regulations remains provisional, but for the purposes of Local Air Quality Management has to be treated as firm.
- 4.3 Taking exposure of the building façade as indicative of the residents exposure to pollution, whilst the dwelling is what guidance describes as a receptor (where the objective should apply at), it is a surrogate for the residents themselves who are the real receptors, and it is their health that the process seeks to protect.
- 4.4 The removal of the residents from the dwelling provides a certain solution to their current and likely future exposure risk, if relocation to a non-AQMA area is achieved and if the dwelling is not residentially reoccupied. This may come about voluntarily or otherwise by compulsory purchase. The site is in a prime location, albeit in the green belt with presumptions against certain forms of development, except where very special circumstances are demonstrated. A change of use from residential to occupational (excluding school, hospital, library etc.) would effectively remove the status of a location where the objective should apply, and the AQMA could then be revoked.
- 4.5 The site is owned by a landlord and managed by agents. The residents are tenants and could at the owners discretion be requested to terminate their occupation. This would be more acceptable if done so voluntarily and with assistance in facilitating relocation to a better environment, moreso if the owner could utilise the site for an

equal or greater income in ways which did not conflict with the air quality objective, or otherwise realise better value for it at sale. The Councils planning staff can proactively assist the property owner to identify suitable alternative uses. The current lease for the site is renewable on an annual basis, running from 29th September each year, with 12 months notice required by both the tenant and the landowner to terminate the lease.

- 4.6 If the property became naturally or voluntarily vacant between now and December 2005, there may be scope for either re-letting on a short term (e.g. six months) only, or that the property remains empty, possibly with some contribution to lost rental income (est. £11,000 p.a.) by one or more agencies. Negotiations could take place to amend the current lease period from 12 months to 6, permitting an alternating use of half the year occupied and half the year vacant (or some other period of less than one year).
- 4.7 Ultimately, if the property remains in continual residential occupation at 31.12.2005 and measured air quality is proven and demonstrated to be above objective levels (and not improving swiftly enough for the exceedance to be temporary and brief), the relevant agencies could determine to compulsorily purchase the dwelling. The powers to secure compulsory purchase are described in section 246 of the Highways Act 1980 and would result the dwellings vacation and the revocation of the AQMA. Warwickshire County Council favour this 'dwelling based' approach to any which relate to highways modification.
- 4.8 Whilst the one property is currently occupied by a single household, clearly any proposal to extend or divide the property to accommodate larger numbers of persons or households should be treated with extreme caution. Planning policies ought to prevent the creation of additional household units at this location. The creation of additional separate dwellings or other targeted property types (relevant receptors) is unlikely in the green belt but should be reinforced as necessary by explicit policy. The issue of air quality has recently been incorporated into planning policy via the Draft North Warwickshire Local Plan, 1st Deposit, February 2003 (ENV11). This gives special consideration to new development in and around Air Quality Management Areas to minimise potential risks to health. See Appendix D.

4.9 The conclusions to this second theme which concentrates on the receptor generated three proposed actions;

A1: Introduce new or clarified policies into [draft] Local Plan or as Supplementary Planning Guidance (Local Policy) for the purposes as stated above.

A2: Explore re-use of the affected dwelling in ways which do not conflict with the air quality objective, voluntarily at first and then compulsorily as required.

A3: Explore alternatives and initiatives with the landlords agent to prevent re-occupation of the dwelling if it falls naturally vacant before other measures take effect.

5.0 Theme B: The Pathway(s)

- 5.1 As emissions of oxides of nitrogen leave vehicle exhaust systems, they travel through air to surrounding areas whilst undergoing chemical changes which form nitrogen dioxide. The efficiency with which they arrive at a receptor depends on the volume and circumstances of emission, and on the atmospheric conditions between source and receptor as they interfere with or assist the process. The quality of air drifting across from the West Midlands conurbation is relevant, as is the presence or lack of other chemical factors involved in the formation or loss of nitrogen dioxide.
- 5.2 Creating a barrier is one way to interfere with that pathway, but isolating the road traffic from its surroundings (for example putting it in a tunnel) is clearly an expensive and disproportionate reaction to a local and site specific problem. However, the concept of barriers may still have merit as regards the construction of the affected dwelling, and as chemical/process interference rather than crude physical screening features.
- 5.3 It is technically feasible to treat the affected dwelling for air pollution in a similar way to how such properties are treated for noise pollution during the construction of new roads, for example. By attention to the envelope and fabric of the dwelling, particularly its windows and doorway openings, provision of cleaner air under positive pressure will effectively keep more polluted air outside. This may significantly reduce the exposure of occupants to nitrogen dioxide whilst within the dwelling (in addition to other pollutants), meeting the objective but possibly not enabling the revocation of the AQMA, which remains a technicality. Such systems would require technical exploration and would need to have the agreement of the building owners and residents, in addition to considerations of capital (installation) and running costs.
- 5.4 It is also feasible to consider the benefits of planting belts or areas of trees and/or shrubbery between one or more of the key roads and the dwelling. This achieves two purposes. Firstly to aid the mixing of polluted air and reduce its downwind effect by dispersal and dilution. Secondly by the reduction in oxides of nitrogen via the natural leaf breathing processes, in addition to benefits in reducing particulate levels, replacing carbon dioxide with oxygen, and gains in many other areas.
- 5.5 Experimental trials have been undertaken with materials [oxides of titanium] which chemically absorb oxides of nitrogen specifically to reduce pollution levels. The materials and much of the information on them originates from Japan and is still

being evaluated. Information on effectiveness, costs and limitations would determine if this measure could be utilised. Early indications are that it may be better suited to enclosed road systems [tunnels] and car-parks, rather than the open situation faced at this location. A London Borough is understood to be at a more advanced stage in evaluating this measure which may better suit their circumstances.

- 5.6 The conclusions to this third theme which concentrates on the pathway(s) generated three proposed actions;

B1: Form a project group to develop further and in detail a planting regime as indicated above which meets or contributes to achieving the air quality objective.

B2: Maintain awareness of developments in denitrification systems as described above, for a future decision on the value of a detailed project specification in due course.

B3: Prepare to form a project group to develop further and in detail a scheme of works to the affected dwelling as indicated above which introduce de-polluted air under positive pressure and improve *internal* ambient air quality. **if other measures prove unsuccessful or are not implementable******

6.0 Theme C: The Sources ['Wider Strategies']

- 6.1 Measures which relate to road traffic, the highways and junctions are featuring strongly in several published and draft air quality action plans. National and regional actions to reduce congestion which itself may provide air quality benefits are ongoing, and further measures are planned and will be implemented in future years. Information on the current policies and state of transport on a national, regional and local scale are available through the DTLR/ODPM and the internet, Regional Planning Guidance, the WCC Structure Plan and LTP and North Warwickshire's own Local Plan. The recent West Midlands multi-modal area study is also highly topical and relevant [see <http://www.go-wm.gov.uk/multiModal/>].
- 6.2 In the broadest sense, reducing traffic emissions may be divided into measures which reduce the numbers of vehicles, and measures which reduce the effects of those vehicles by their type, fuel and how they are driven. There are measures and trends which are occurring and will continue anyway, and other measures which ought to be implemented and certainly should happen, in addition to further options which may only occur if they are acceptable, affordable and attractive. Most of the significant measures which relate to transport and trunk roads are in the remit of the HA and WCC, though the Borough Council can and should make a contribution to resolving the air quality problem through its own actions, policies and resources.
- 6.3 The effectiveness and capacity of the trunk road network is a matter for the Highways Agency. There are broad and numerous measures available, primarily but not wholly to the Highways Agency, to ensure that the network functions efficiently and that congestion is minimised. The reduction of congestion by traffic management is desirable for purposes beyond air quality, so long as that reduction is not cancelled out by released road space being taken up through other road users.
- 6.4 It was not considered necessary nor feasible to examine in great detail all possible measures to the highways and junctions which may not necessarily come into play. In the context of the preceding information in this plan, to do so would be premature and disproportionate. As there are ongoing and emerging matters which might directly impact upon the road network and traffic, anything prepared in detail now may not fit the situation for 2005/2006 onwards. It is, however, acknowledged that proposals have been made to widen the M42 immediately to the south of the AQMA and to install traffic management systems to control the vehicles on it. The potential impact and timing of these proposals will be kept under review.

6.5 Potential measures have been summarised, for illustration purposes only, at appendix B, but this is not an exhaustive or exclusive list and remains open for additions and deletions. The actual selection and implementation of measures is generally a matter for the Highways Agency in respect of trunk roads. If the A446 is de-trunked following the opening of the M6(Toll), then matters relating to that road will fall to Warwickshire County Council.

6.6 Those matters which fall to North Warwickshire Borough Council to consider and pursue further are;

- Planning – policies within the Councils own Local Plan, and contributions to the Local Transport Plan [LTP] and Structure Plan of Warwickshire County Council, in addition to broader regional plans. Within this subject, ongoing support for the development of park & ride sites, including Hams Hall near Coleshill, would be included. Further policies may be developed to influence restraint on traffic growth in the affected part of the Borough. Modification of land use planning via various policy documents, including the Local Plan, Structure Plan, Regional Planning Guidance, Unitary Development Plan etc. could be appropriate. This might impact on development in the longer term to limit the growth of car dependency and necessity by the considerate positioning of homes, jobs, leisure and commercial uses in relation to transport infrastructure. Growth may be limited in sensitive areas and encouraged towards areas with more capacity, or capacity enhancements may have to form part of developments via planning agreements. These enhancements should favour public transport, walking and cycling over private car use. Deliberate parking space reduction may deter some private car use, but may inadvertently cause off-site parking problems. Modification of the Local Transport Plan [LTP] can have significant influence on the investment in transport infrastructure and its eventual patterns of use. RTRA targets, support for park & ride provision, lane priorities, junction and carriageway improvements, bypass schemes, signalling and messaging systems, rail and bus provision, freight etc. may all contribute to the alleviation of congestion and pollution. An intelligent and robust LTP is a platform from which further specific policies can be developed and implemented, and through which funding bids are made.
- NWBC vehicle fleet – as an operator of a vehicle fleet, efforts the Council can make to 'green' its own transport impacts would have the added benefit of

demonstrating the advantages and practicalities to other local fleet operators.

This subject overlaps with the next issue, that of travel plans.

- Green/School Travel Plans – Plans for the effective management of travel by (typically) an employment site, venue or school have variously been known as Green or School Travel Plans. The Council has made a commitment to develop its own Travel Plan, and when that is complete and implemented it can be demonstrated to others as above. Some resource has already been allocated to preparing this plan, and the formation of a project group is under development. Promoting such plans to schools and other businesses and fleet operators, particularly those local to Coleshill and the AQMA site, may have clear benefits on local traffic congestion. DEFRA also suggest promotion of travel plans to the 'wider community'. As the operator of a vehicle fleet, NWBC can make positive efforts to lead by example by first conducting an audit of its own traffic impact and then determining how best to mitigate it. This may be accomplished by;
 - Replacement of vehicles with new(er) models and/or LEV alternatives,
 - Retrofitting of exhaust treatment or LPG fuelling options
 - Driver training (encouraging smoother, slower and safer driving habits)
 - Vehicle maintenance and emissions testing regime
 - Route planning, speed and capacity/load management
 - Standard specifications to contracted service providers in documentation
 - Parking policy bias towards LEV and car-sharers
 - Provision of secure cycle storage, lockers and showers
 - Revision of essential and casual car user lump sum and mileage rates, and cycling mileage rates
 - Revision of lease car scheme terms
 - Financial support including preferential loans for rail/bus season tickets
 - Car share network support
 - Flexi-time and home/tele-working support and development
 - Promotion of smaller, more efficient cars.

Once having an effective travel plan in situ, the Council is well placed to demonstrate the benefits and to promote such plans to other major employers and transport fleets in its area. It can also work with schools and the education authorities to minimise the impact of school run vehicular traffic on the network by selective application of the above plus additional options such as the school bus and walking bus.

- Public information & education – providing appropriate information on air quality and transport choices is an essential part of a broader set of measures to influence behaviour.
- LEV fuel infrastructure – increasing the market penetration of cleaner fuelled vehicles by encouraging the development of the refuelling infrastructure has to play its part in the larger scheme. Opportunities to do so, through the planning process and by requirement with legislative backing should be explored.
- Road freight to rail – on two levels, by influencing the movement of freight to and from North Warwickshire sites by rail instead of road would be positive, and nationally to support that trend, may reduce HGV traffic in particular in the AQMA vicinity. However, it is recognised that significant increases in rail freight may only result in a much smaller reduction in road traffic.
- Lobbying - The Council may lobby government on issues which require national implementation, or where additional local powers need to be sanctioned or permitted by new laws. They could involve taxation encouragement, or taxation discouragement, fees and charges or fines, education and promotional work.

Examples include;

1. Fuel tax - as a traffic regulator this has its advantages and drawbacks. The backlash of the recent fuel protests however makes the prospect of significant road fuel tax rises less likely. Greater support could be given to LPG or other cleaner fuels by maintaining or increasing the tax differential between them and other regular fuels.
2. Vehicle Excise Duty [VED] - is already being used to influence vehicle choice but could be used further.
3. LEV and exhaust treatment retro-fitting grants and financial support – the Powershift, CleanUp and Motorvate programmes should be supported and extended where possible, or combined into a simple one-stop-shop. [See <http://www.roads.dft.gov.uk/cv/index.htm>].
4. Legislation could require a proportion of public service, Council, Police, Fire, Ambulance and similar vehicles to attain certain emissions standards and/or that a proportion ought to be LEV fuelled, and that contracted services contain similar conditions etc.
5. Fuel retailers could be required to offer LPG or other agreed LEV fuel types at public petrol station forecourts if their capacity exceeds a certain amount, or on all trunk roads, or within or near to AQMA's.

6. Public information and education on alternative travel methods and fuels should and can be increased, building upon initiatives such as Don't Choke Britain Month, Bike-to-work day and 'leave the car at home' day etc..
7. Subjects could be introduced into the education syllabus which reinforce the messages about travel choice and the consequences of driving behaviour.

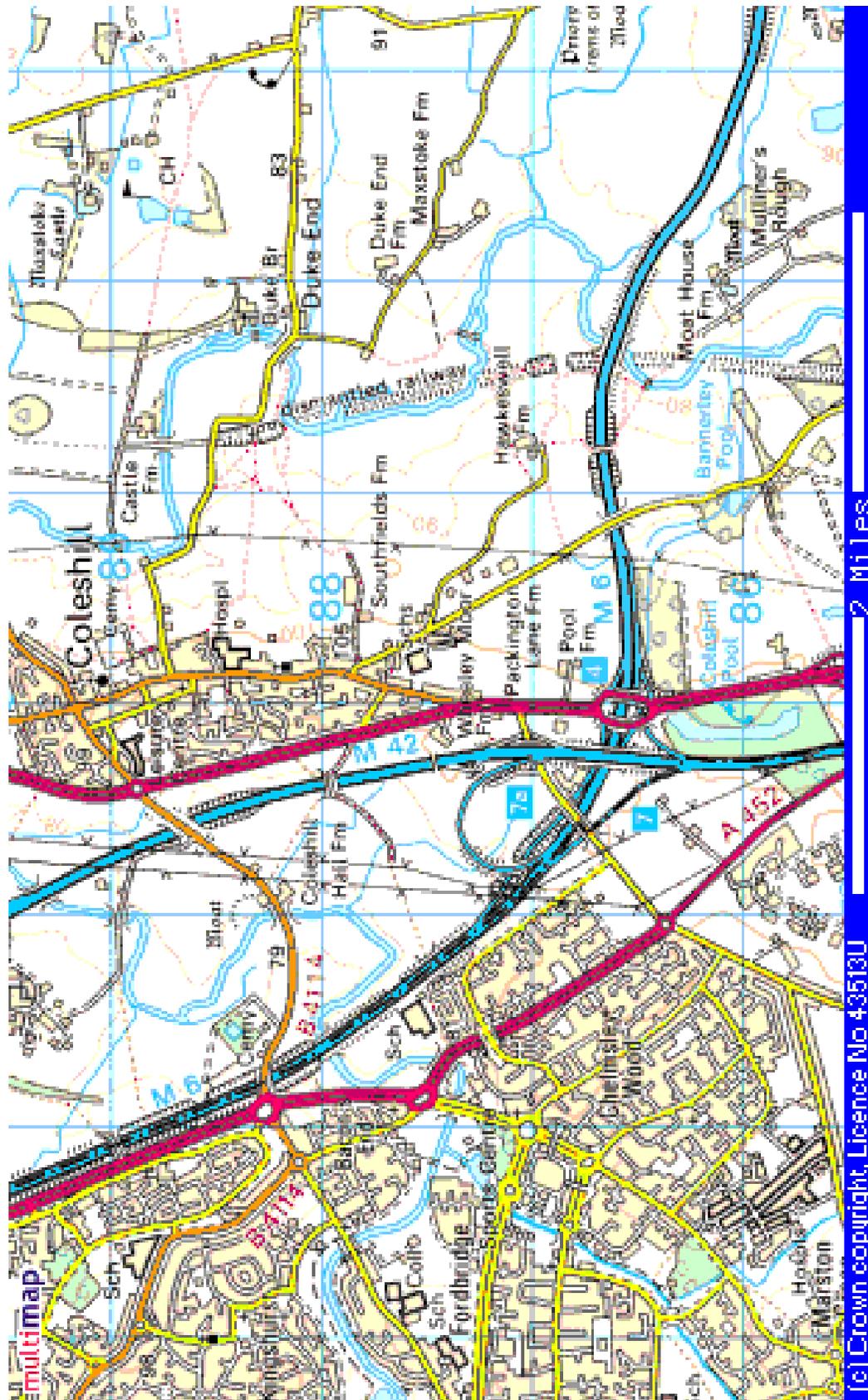
6.7 The conclusions to this final theme which concentrates on sources generated three proposals;

C1: Request the Highways Agency and Warwickshire County Council to maintain awareness of the air quality issue and report back from time to time on measures and matters which may impact upon it.

C2: Develop the NWBC Green Travel Plan [GTP], commencing with an audit of the Council's fleet and wider operational traffic impacts. On completion and implementation of the GTP, promote GTP's and School Travel Plans to a wider audience, focusing on the Coleshill area, to include local employers and the Community.

C3: Lobby on the issues described above and others as they arise, with the approval of the appropriate NWBC forum.

Figure 3 – Map: AQMA environs & road network



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7.0 Finance

7.1 The Borough Council has already expended considerable resources in meeting its obligations to date, through its staff and the purchase and support costs of monitoring equipment in addition to the CES consultants reports covering stages 1-3 of the process. Further costs have been met to enable the development and consultation process in producing this [draft] action plan. That expenditure will continue beyond the final adoption of the plan, through its implementation and review, and will include the 2003 second round of review and assessment. Even if no AQMA had been declared, or if the current AQMA is revoked, the issue would still require resourcing to monitor and review.

7.2 The contribution of resources, principally staff time and some data, from other agencies and partners is acknowledged and appreciated.

7.3 To forward-plan a budget for implementing the AQAP is not straightforward. The variables described in the report may cause the air quality objective to be met 'naturally' at minimal or no apparent cost, or one or more of the proposed remedies may be appropriate. In the latter case, it is not feasible to produce spending plans for each proposed remedy in isolation and combination, identifying the time it should occur, its likely actual cost and its effect or outcome. Decisions on which, if any, proposals to implement would have to be taken as data emerged from monitoring and modelling in the context of the continuing use of the property and road network.

7.4 Of the future expenditure which can be reasonably estimated;

- Air quality monitoring station running costs are approximately £5000 per annum, to at least 2005 and possibly beyond (though the equipment may have re-sale value if redundant)
- NO_x diffusion tube support and analysis costs are approximately £2500 per annum, to at least 2005 and possibly beyond but with no residual value
- General staff costs to support the review and assessment process (including stage 2) are approximately £4000 per annum [costs of external agencies NOT included], to at least 2005 and probably beyond.

All of the above are currently met by North Warwickshire Borough Council. For the remaining proposals;

- Estimated costs are as per the schedule at 8.0

8.0 Implementation and Monitoring Schedule

Proposal	Responsibility [organisation(s) / dept(s)]	Est. start date <actual start date>	Est. duration or completion date <completion date>	Est. costs* <actual costs>	Est. impact** <actual impact, if known>
•	NWBC Env. Health	Currently ongoing	Beyond 2005 <>	£5-6000 p.a. <>	0
•	NWBC Env. Health	Done / ongoing	Annual review <>	Included in A1 <>	0
•	NWBC Env. Health	2003 <>	As start <>	Negligible <>	0
•	NWBC Env. Health	2003/4 <>	1-2 weeks <>	Included in A1 <>	0
A1	NWBC Env. Health / Planning	2002 <>	2003 <>	Negligible <>	Marginal/negligible <>
A2	NWBC Env. Health / Planning	2004/5/6 <>	2005/6 <>	Negligible to very high for CPO	Immediate compliance and AQMA revocation
A3	NWBC Env. Health / Planning	2002/3 <>	2005 <>	Negligible to £11,000 p.a.	Possible immediate compliance as above
B1	NWBC Community Development	2003/4 <>	2003-5 (to implement planting, could extend) <>	Inestimable – depends on grants, land purchase etc.	Maximum 10% improvement <>
B2	NWBC Env. Health	2003/4 <>	2003-5 <>	£5-10,000 capital + annual operating fees	Possible immediate health protection without AQMA compliance
B3	NWBC Env. Health	Currently ongoing	Continuing	nil	n/a
C1	HA / WCC	Currently ongoing	Continuing	Negligible to NWBC, more to others	Inestimable – depends on measures applied
C2	NWBC Various	2003 <>	2005 <>	Inestimable – depends on content	Negligible to AQMA <>
C3	NWBC Various	2002 onwards <>	Ongoing <>	Negligible <>	Depends on success/scope

* costs are difficult to attribute or estimate with accuracy. At best they represent the possible expenditure on staff time, equipment/data etc. on the basis of £20 per person/hour, and those costs may fall outside of the Borough Council to the County, Highways Agency or others.

** impact is even harder to forecast quantitatively, but where possible figures or a 'range' is included, and qualitative issues identified.

9.0 Monitoring, Review and Reporting

- 9.1 Where possible, each proposal should have an estimated start date, duration and/or completion date. North Warwickshire Borough Council's Environmental Health Division, together with other partners/agencies as appropriate will **monitor** achievement of the proposals by those key dates. Progress towards meeting those key dates will be monitored also at an appropriate frequency beforehand. The implementation plan [8.0 above] will be updated accordingly.
- 9.2 The ongoing relevance of each proposal will be **reviewed** as information on them is obtained or developed. If it emerges that a proposal is no longer appropriate or accurate, or that a key date is wrong, it will be reviewed and amended accordingly.
- 9.3 The whole plan will be reviewed no less frequently than once per annum. This would be led by the Borough Council's Environmental Health Division and include other plan partners and agencies, both internal and external, as required. Conclusions and suggestions arising from that review would be **reported** to the Council's Community and Environment Board and plan partners. Following that, a report will be made generally available to the public and on the website, as well as notification to the media.

Analysis framework.

PHASE 1 – Cost and benefit

- ❖ What will the measure cost? In terms of;
 - Capital – singular costs, usually of equipment purchase
 - Revenue – running and staffing costs, including insurance, power, consumables and depreciation
 - Income – grants, fees, fines etc.
 - [consider how accurate do the figures need to be and how accurately are they provided or within what margins]. Are there other financial costs and/or benefits falling elsewhere? Are any costs recoverable or will any be repetitive?
- ❖ What emissions reductions and air quality impact will the measure achieve? [at what cost, allowing comparison on cost per unit impact or impact per unit cost]. Including; *how long it would take to implement the measure, how long from implementation effects would occur, whether the impact is total / immediate or phased in, whether the effect has a limited life and then declines or requires reinvestment, whether there are synergies or conflicts between measures, whether there is a natural trend, how much confidence is attached to the estimate, if the measure has been implemented elsewhere, how many people or what area would be affected and so on.*

PHASE 2 - Other considerations:

- ❖ Noise – would a measure alter the intensity, character, duration, timing or location of noise, and if so by significant increase or decrease?
- ❖ Safety – would the measure make journeys safer or more dangerous? Would traffic be displaced towards less suitable roads?
- ❖ Visual amenity – would the measure improve or spoil the view? <subjective>
- ❖ Local / regional / national economy – could the measure add costs to business and drive away trade or stimulate growth (e.g. commerce) by the attraction of shoppers, tourism and leisure users, increased residents through less void dwellings?
- ❖ Crime – including fear of crime e.g. on night buses
- ❖ Sustainability – can a measure make a lasting difference and is it capable of long term support?
- ❖ Freedom of choice – are affordable alternatives available at convenient locations, sufficiently frequent and at relevant times with capacity?
- ❖ Congestion [journey times] – would reductions in congestion be offset by increases in emissions through increased vehicle speeds and/or higher numbers of vehicles travelling?
- ❖ Community severance / displacement – would the measure place a barrier between communities or displace occupants?
- ❖ Enforcement – who will enforce the measure and how effectively?
- ❖ Likelihood of success – is success guaranteed, likely, probable, possible or less certain?
- ❖ Reversibility – can the measure be reversed if it is shown not to work or have undesirable effects?
- ❖ Failure cost – arising from reversibility, how much would failure cost and can the risk be afforded or mitigated? What of liability?
- ❖ Effects on other air quality issues [carbon dioxide and/or other LAQM pollutants] – would the measure assist in combating global warming and/or reducing [or worsening] other key air pollutants?
- ❖ Impacts to areas beyond the AQMA – what wider effects on traffic patterns, jobs and other issues might occur?
- ❖ Habitat loss, bio-diversity, heritage – would the measure involve land-take, the loss of significant structures, reduction in habitats etc.?
- ❖ Health and fitness [walking/cycling] – would the measure improve personal fitness and health through physical exercise?

- ❖ Perception / acceptability (community, political and organisational) – what will key stakeholders think of the measure? Who might resist or support it and how? Is there an information campaign to be fought and won first?
- ❖ Competing priorities – what else do the partner organisations want to focus their resources on? Are any key policies mutually supportive with air quality, or in conflict?
- ❖ Equity (disabled / rural) – does a measure disadvantage disabled people or those living in rural areas, or the poor or car-less or otherwise?
- ❖ Proportionality / consistency (fairness) – how well does the 'polluter pays principle' fit?

Potential measures to reduce vehicle emissions at source.

These highway / traffic measures may be sub-divided into;

- Changes to the major roads and the way in which they are used
- Changes to the junctions and the way in which they are used
- Changes to the vehicles or numbers/classes of them
- Changes to driver behaviour, vehicle maintenance etc.

Changes could be brought about by education and support, incentive (carrot) or disincentive (stick). Some may be applied in sequence, others together in parallel. Some could be introduced immediately, whilst others are deferred, phased in over time or for the future. Some may be permanent in their effects whilst others are temporary. Some may have to be applied for the whole time, others only part time or for a limited time. Some may be widely spread and others narrowly geographic.

Potential changes to the **road network** which have been considered [none of the following lists is exhaustive or exclusive] include;

- Speed reduction enforcement [various permutations e.g. certain times or certain days only, variable or permanent] – reducing traffic speeds can reduce emission levels in some circumstances.
- Advice signage – fixed, active/variable message signing and radio/internet etc. to provide sufficient driver information to avoid hazards and delays, getting lost or taking less efficient routes to destinations,
- Traffic smoothing including ‘no lane change’ zones and spacing chevrons – to facilitate smoother integration of traffic joining or leaving the main carriageways,
- ‘move over’ arrows for filter-in lanes – again to make safe space available to facilitate smoother integration of traffic streams
- high occupancy vehicle lanes [HOVL’s] – to use existing (or additional) road space for vehicles carrying passengers as an incentive to increase usage densities,
- Exclusion / clear zone(s) – considered but not appropriate for trunk roads,
- Low emissions zones – restricting access to a zone for vehicles which fail to meet certain emissions criteria (again considered but rejected as unsuitable for trunk road systems),
- Congestion charging [road tolling] – possible in the future as part of a national programme, but only if sufficient alternatives put in place to facilitate choice of other modes and avoiding displacement of traffic to less suitable roads,
- Hard shoulder running –where safe, either at junctions for increased access/egress capacity, as crawler lanes up inclines or otherwise,
- Road and/or carriageway closure/narrowing [capacity reduction] – considered and rejected as not appropriate to the trunk network as likely to increase congestion and displacement,
- Traffic ‘calming’ / traffic management [includes elements of speed control, gateways etc.] – elements of both included within other measures excepting gateways as the problem area is not a typical city centre where such measures would be appropriate,
- Flyover, bypass or underpass(es) – considered and rejected as the M6(Toll) is already being built to provide that bypass capacity. Also considered premature and hugely expensive given the uncertain diagnosis of the extent of pollution exceedence and the contributions of each carriageway prior to M6(Toll) opening. Disproportionate also, in the context of protecting one residential dwelling.
- Additional lanes or partial / selective carriageway widening – There is potential for future M42 widening south of this junction, and M6 widening elsewhere, which may affect the junction throughput if either or both proceed. If the primary routes feeding towards this

junction have their capacities increased, this may cancel out the positive effects other measures which should be viewed accordingly.

- Repair & maintenance scheduling, finished standards and accident reduction – the standards to which highways, barriers, lighting and associated amenities are built and maintained and the timing of those works are significant in the manner in which roadworks can cause congestion and pollution.
- Motorway service area access/egress to surroundings and/or additional junctions – permitting traffic access and egress to the motorway from the minor road network supplying the motorway service areas, specifically Corley north and southbound. This may reduce traffic converging on the M6 junction 4 roundabout with the A446 where it could otherwise have a shorter and more efficient journey. Additional junctions would have a similar effect, though very expensively. Consideration must, however, be given to the capacity and safety of the minor road networks supporting the service stations and the implications for persons living along those routes.
- Cycle lane[s] / footpath improvement and crossings on A446 – any measures to increase safe cycling and walking in relation to the A446 and Coleshill Heath Road, as the only close non-trunk roads, may have a small beneficial effect on providing an alternative journey choice.
- Additional bus stops [A446 environs] – a lack of sufficient bus stops may deter potential bus travellers who then use their car. More stops or attention to routing and timings may stimulate greater bus travel patronage and commensurately reduce car journeys.

Potential changes to **junctions** may include>

- Filter lanes – to permit vehicles to negotiate junctions without undue delay
- Traffic light controls – to smooth flows through roundabouts or other junctions and avoid excessive queues forming
- Ramp access metering – regulating access to (e.g.) the motorway via traffic lights, to improve the flow of traffic both on the motorway and avoid excessive queuing on slip-roads and back onto roundabouts
- Priority alterations – to maximise the efficient flow of vehicles by ensuring that rights of way, road space and give-ways are optimised
- Improved signing / lane marking designation and arrows – to assist vehicles with choosing the correct and best lane early enough to avoid stalled traffic whilst vehicles seek room to switch
- Widening or narrowing including entry/exit closure – to resolve choke-points and deter wide or long vehicles from unsuitable road space
- Yellow no-stopping boxes – to avoid gridlock particularly at junctions where other traffic could more efficiently move onwards.

Potential changes to **vehicles and organisational/driver behaviour** may include>

- Promotion of the cleaner fuels market and fleet penetration through infrastructure development – to encourage a higher rate of uptake for LEV fuelled vehicles by increasing the public and fleet refuelling outlets available,
- Promotion of cleaner fuels market/fleet penetration etc. through fleet management [Council fleet, lease, business and private travel by way of financial and contractual leverage] by first having its own Council Green Travel Plan,
- Promotion of green transport plans [to other businesses and organisations] and school travel plans,
- Promotion of smaller, more efficient cars,
- Promotion of alternative working patterns and schedules, to spread the rush hour traffic peaks and reduce the need to travel so frequently or so far
- Advanced 'green' driver education for smoother more efficient motoring,
- car share database and the promotion of offering and seeking lifts,
- support of home-work journey shortening through smart employment and recruitment support, linking local jobs and local workers

- Promotion of mode shift for freight from road to rail etc.,
- Promotion of passenger/driver shift to bus or rail, via e.g. integrated scheduling, ticketing, service frequency, cleanliness, access points, timing, capacity, destinations/routes, safety, ticket discounting etc.
- Park and ride, either car to bus or rail or both
- Appropriate development zoning [reduce the vehicular load on the AQMA and deny further housing in or near to it],
- Vehicles emission testing – voluntary and mandatory including vehicle maintenance encouragement/support,
- A ‘scrappage’ bounty to target and remove older and dirtier vehicles,
- Alteration of parking standards in the local plan to deter car dependency,
- ‘switch off engine’ enforcement,
- car park charging [on and/or off street and workplace parking charges],
- public information booklets, leaflets, web-pages etc.,

North Warwickshire Borough Council is seeking the views of as many statutory and non-statutory consultees as possible. This draft plan is being widely circulated and made available to the public both via the internet, on request by post, at Council offices, libraries and other facilities as opportunity provides. Awareness of the draft plan and invitations to comment on it are to be circulated via the local media, parish and town Councils.

Comments may be made in writing including by fax and Email. Contact details are given at the foot of this page. You may use the following questions to prompt your response, or reply on any matters as they occur to you. If you need any matter explaining or have questions before making a response, please contact the David Baxendale or Dean Walters (details below).

- **Does the plan explain all of the issues you need information on?**
- **Are all of the issues explained in sufficient detail?**
- **Are there any additional matters you think the plan should have explained?**
- **Which of the proposals do you agree most strongly with?**
- **Which of the proposals do you object most strongly to?**
- **What additional proposals would you have included?**

Comments, suggestions and observations can only be treated confidentially on request. All responses received will be considered in taking this draft plan to a final version, which will be reported to the Council's Community & Environment Board for approval and formal adoption.

The closing date for receipt and consideration of comments is 31/12/2002

Contact details:

David Baxendale - tel. 01827 719322 or Email davidbaxendale@northwarks.gov.uk

Dean Walters - tel. 01827 719330 or Email deanwalters@northwarks.gov.uk

Office fax number 01827 719399

Address: Environmental Health, North Warwickshire Borough Council, Old Bank House, 129 Long Street, Atherstone, Warwickshire CV9 1BG.

ENV11

AIR QUALITY

The Council will safeguard and enhance air quality in the Borough by:

1. Giving special consideration to new development in and around the Borough's Air Quality Management Areas (AQMA) to minimise potential risks to health. The existing AQMA is shown on the Proposals Map.
2. Not permitting development that would include hazardous substances likely to have an unacceptable risk to nearby areas and people.
3. Not permitting development in the vicinity of notifiable hazardous installations or premises if there is an unacceptable risk to occupiers.
4. Not permitting places of residence, employment or other noise-sensitive uses if the occupants would experience significant noise disturbance.
5. Not permitting development that would create significant noise disturbance to nearby housing, schools and other noise-sensitive uses.

Reasoned Justification

- 3.79 Major requirements to improve air quality have been introduced by Government since the previous Local Plan was adopted.
- 3.80 Certain substances, when processed or stored in significant quantities can be a potential hazard to people in the vicinity in the event of explosion or escape.
- 3.81 Up-to-date lists of Sites Subject to Hazardous Substances Consent and pipelines subject to the Notification of Installations Handling Hazardous Substances Regulations may be inspected at the Borough Council offices and advice can be obtained from the Health and Safety Executive.

Monitoring

- 27 *Percent of the Borough land area within an AQMA.*
- 28 *The number of air pollution / noise disturbance incidents.*

Footnotes from text

- ⁱ The Air Quality Strategy for England, Scotland, Wales and Northern Ireland – working together for clean air. Cm 4548, SE2000/3, NIA7. January 2000, ISBN 0 10 145482-1, £20
Available from The Stationary Office (www.tsonline.co.uk) or at
<http://www.defra.gov.uk/environment/airquality/strategy/index.htm>
- ⁱⁱ DEFRA Helpline, 3-8 Whitehall Place, London SW1A 2HH, tel. 08459 35577, fax. 0207 238 6591,
Email air_quality@gsi.gov.uk or visit website at www.defra.gov.uk/environment/airquality/laqm.htm
- ⁱⁱⁱ The Air Quality (England) Regulations 2000 at;
<http://www.defra.gov.uk/environment/airquality/airqual/index.htm> or from Department of the
Environment, Transport and the Regions Publications Sale Centre, Unit 21, Goldthorpe Industrial
Estate, Goldthorpe, Rotherham S63 9BL. Tel: 01709 891318 Fax: 01709 881673
- ^{iv} EC directives 1999/30/EC and 96/62/EC refer. See also
<http://www.defra.gov.uk/environment/airquality/article5/pdf/appendix2.pdf>