WEST DORSET DISTRICT COUNCIL

CHIDEOCK AIR QUALITY MANAGEMENT AREA

FURTHER ASSESSMENT REPORT

July 2008

TABLE OF CONTENTS *Page*

Introduction

West Dorset District Council (WDDC) has undertaken a further assessment of air quality in Chideock as part of its duty under the Environmental Act 1995. This report follows on from the detailed assessment for nitrogen dioxide completed in 2006 that led to the designation of the air quality management area in Chideock in May 2007.

There are two principle aims of the Further Assessment, to confirm the original decision to declare the AQMA, and to quantify the source apportionment of emissions for development of the action plan. The initial aim is to assess whether the AQMA is still required and if so, whether it needs increasing or decreasing in size. The further assessment should also be used to inform the action planning process. The first is in providing some source apportionment for focusing specific action planning measures and the second is in calculating the improvements required to achieve the objectives. The improvement required to attain the NO_2 annual mean air quality objective of 40ug/m3 will be calculated for the worst-case diffusion tube monitoring location within Chideock.

Summary of Previous Review & Assessments

Local air quality management forms a key part of the Government's strategies to achieve the air quality objectives under the Air Quality (England) Regulations 2000 and 2002.

As part of its duties the Council completed its Updating and Screening Assessment of the seven LAQM pollutants in 2006 and concluded that a Detailed Assessment for nitrogen dioxide was necessary in Chideock.

The results of the Detailed Assessment of NO_2 identified a risk of the annual mean objective (see Table 1) being exceeded after 2005. As a result the Council designated an AQMA for nitrogen dioxide along the A35 running through the centre of Chideock in May 2007. (See figure 1.1 below).

Table 1 Air quality objective relevant to this Further Assessment

Pollutant	Air Quality Objective		To be achieved by
	Concentration	Measured as	
Nitrogen Dioxide	200 µg m^{-3} not to be exceeded more than 18 times a Year	1-hour mean	31 December 2005
	40 µg m^{-3}	Annual mean	31 December 2010

Chideock Air Quality Management Area

Since the declaration in May 2007 WDDC has continued to monitor in Chideock using diffusion tubes at three key locations. The monitoring is undertaken using diffusion tubes supplied and analyzed by Gradko. The method of preparation is 50% TEA in acetone.

Fig 1.1 shows the locations of the diffusion tubes within Chideock. It also shows the extent of the AQMA boundary.

Figure 1 Chideock diffusion tube sites and AQMA declaration area

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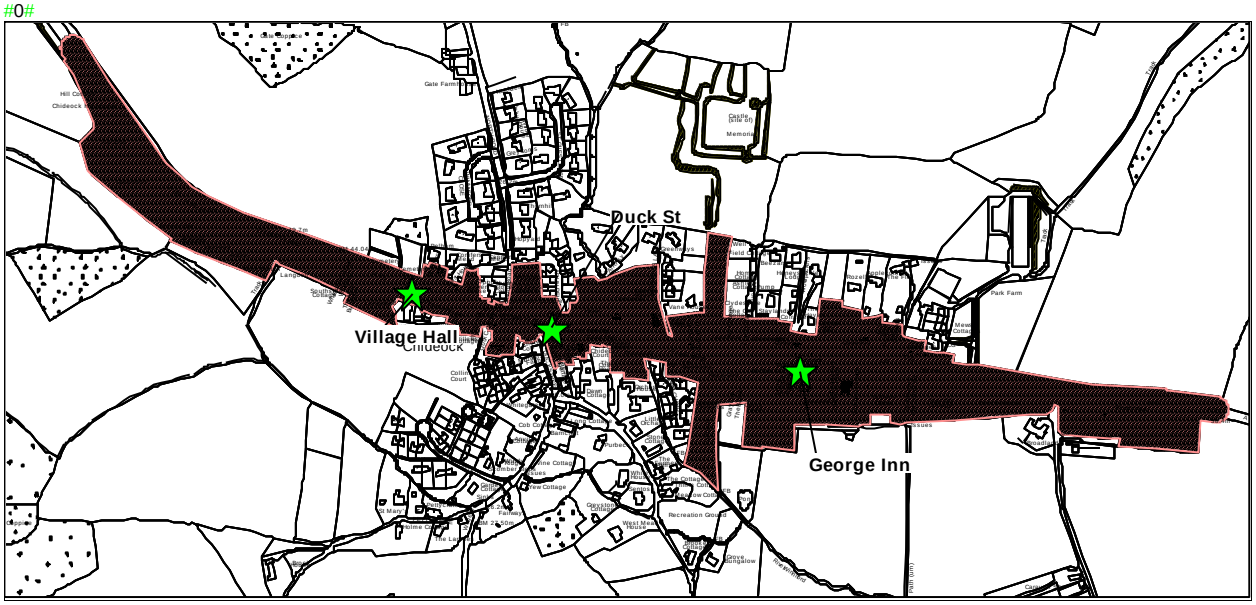


Chideock lies in a valley with steep inclines at each end of the village. A main trunk road (A35) runs through the centre and there are speed restriction cameras that reduce vehicle speed to 30mph at both ends of the village. A traffic count undertaken in 2007 showed that there were approximately 16,000 vehicles per day traveling through Chideock, of these, 88% were LDV's and 12% HDV's.

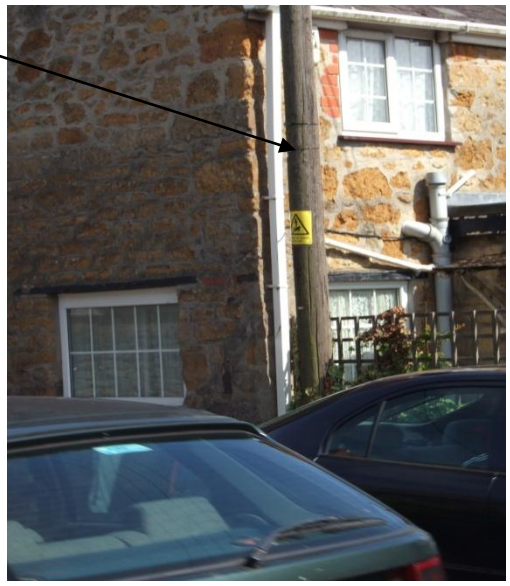
Diffusion Tube Handling Procedures

The WDDC NO_2 diffusion tube monitoring is carried out in full accordance with the site quality assurance procedures contained in the UK Automatic Network Site Operator's Manual. When the diffusion tubes are received in the post from Gradko they are stored in a refrigerator within the supplied packaging. The tubes ends are not removed until the tube has been placed at the monitoring location at the start of the monitoring period. Once the sampling period is completed, the tubes are recapped with the storage caps and returned for storage in the refrigerator until they are returned to Gradko for analysis. The tubes are returned within 24 hours from the end of the sampling period.

Diffusion Tube Locations

George Inn Site Grid Ref: 342482/92790

The diffusion tube at this site is located on a telegraph Pole directly outside a residential premise. This house faces directly on to the A35 road. Monitoring here commenced in 2005 and has not exceeded the national objective set. However there are proposals to construct a pedestrian crossing near this location, therefore monitoring will continue herein order to inform us whether there will be any changes in air quality once the crossing is in place.



Duck Street Grid Ref: 342184/92842

WDDC have been monitoring at this location since 2000. The highest levels of NO_2 are recorded at this site. The tube is positioned on the façade of a residential dwelling and is on the corner of a junction between the A35 and Duck Street and is half way up a steep incline coming out of Chideock towards Lyme Regis. Traffic regularly builds up at this location as a result of traffic exiting Duck street onto the A35 East bound and when west bound traffic turns right into North street. This photo shows the A35 looking east towards Bridport.

Village Hall Grid Ref: 342002/92888

The diffusion tube here is located on the façade of the village hall, not a residential property, however it is at the same distance from the A35 as other dwellings in Chideock. The Village Hall is located opposite the east bound speed camera This photo shows the A35 heading towards Lyme Regis where the A35 opens up to a two lane carriage way to facilitate overtaking.

Chemoluminescent Analyser

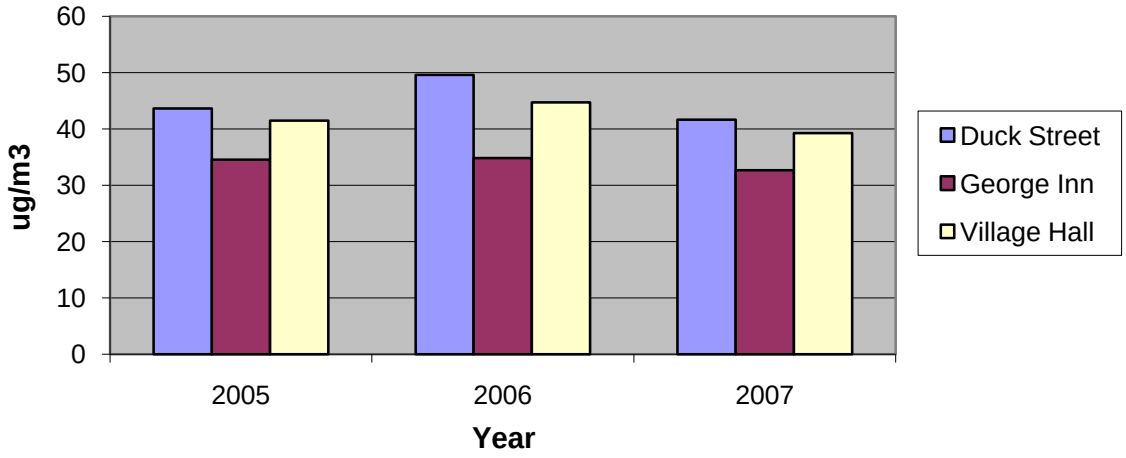
WDDC received a grant from Defra in August 2007 to help fund for a chemoluminescent analyser in order to provide a more accurate picture of nitrogen dioxide in Chideock. WDDC has purchased the equipment and are in the process of installing the analyser in Chideock. The siting of the monitor has been an ongoing process with discussions held between WDDC, The Highways Agency, Connect and the Chideock Parish Council to provide a site that is suitable. A meeting has been set up between parties to finalise the site at the end of July 2008. We will be undertaking a local co-location study to gain a local bias adjustment once the site has been established.

In lieu of this, appropriate correction factors for measurements between 2005-2007 have been derived from the latest default factor spreadsheet (April 2008) from Defra's review and assessment helpdesk. These factors are derived from series of co-location studies undertaken nationally.

Chideock Passive Monitoring Results 2005-2007

Below are the 2005-2007 diffusion Tube results for Chideock. These results show that Duck street has exceeded the national objective for nitrogen dioxide, whereas The Village Hall location was marginally under the objective and was met at the George Inn monitoring site.

NO_2 Diffusion Tube results Chideock 2005-2007 (bias adjusted)



Source Apportionment

In order to develop an action plan it is necessary to identify the relative contributions to the exceedence of the annual mean of nitrogen dioxide objective from different sources at the worst-case location. This will facilitate the selection of the most cost effective actions that can be targeted at the source primarily responsible for the emissions.

The level of improvement required in order to achieve the annual mean objective for nitrogen dioxide has been considered at Duck Street, as this is the location of highest concentration.

Background maps provided by Defra show that the 2007 background NO_2 concentrations for Chideock was 6.9µg m^{-3}. The annual mean for nitrogen dioxide recorded at the Duck Street location in 2007 was 41.62µg m^{-3} Therefore a reduction of

approximately 2µg m^{-3} is required. There are no industrial processes that could contribute to NO_2 emissions within the vicinity.

Actions to reduce the background concentrations will have a negligible effect, therefore, the percentage reduction in nitrogen dioxide concentrations required relates to the road traffic component only.

6.9µg m^{-3} of NO_2 within Chideock is a result of background emissions. This equates to 16.5% of NO_2 contribution, the rest, 83.5%, can be concluded as a result of road traffic emissions as there are no other sources within this area. To achieve a target below the national objective there needs to be a reduction of approximately 6% of NO_2 emissions from road traffic.

Predicted Measures

The table below shows 2007-2008 bias adjusted diffusion tube results for Chideock, and projections to 2010 using the LAQM Year Adjustment Calculator provided in the UK Air Quality Archive Website.

Table 1.2 Predicted nitrogen dioxide results

Site	**2007 annual mean** (µg m^{-3})	**2007 annual mean Bias adjusted** (µg m^{-3})	**Predicted to 2009** (µg m^{-3})	**Predicted to 2010** (µg m^{-3})
CHIDEOCK				
Duck Street	**44.76**	**41.62**	38.63	34.03
George Inn	35.13	32.67	30.33	29.23
Village Hall	**42.21**	39.25	36.43	35.48

The predictions indicate that the national objective for nitrogen dioxide will be met in 2010 without any intervention. However WDDC is committed to developing an action plan to help improve air quality in Chideock. This action plan is being developed as a

contingency should the measured trend between now and 2010 not play out as the extrapolated trend suggests.

An annual consideration of the risk that the limit value will not be met by 2010 will be undertaken and a threshold will be set for 2008 and 2009 annual means above which additional measures in the action plan would be implemented. The Contingency plan will develop proportionate action plan measures so that decisions can be made to implement them depending on the result of the annual risk assessment.

Potentially a number of measures in the action plan will be implemented regardless of the risk assessment since they are proportionate, cost-effective, aligned with authority policies and may reduce the risk that more stringent measures will be required in future.

Action Plan Progress

A meeting was held on the 4th July with Key Stakeholders, with an outcome of putting together a draft action plan that we would then put forward in a public consultation with the residents of Chideock before submitting the action plan to Defra. Table 1.2 shows the proposed timetable for implementation of the Chideock Air Quality Action Plan:

Table 1.3 Proposed Timetable for Chideock Action Plan

4 July 2008	Key Stakeholders met to discuss possible action
11 July	Draft 1 discussion document circulated to attendees for comment and development
1 August	Comments back
8 August	Draft 2 discussion document circulated to attendees for approval and further development
29 August	Draft 3 discussion document circulated to attendees prior to village consultation
3 September	A Discussion document placed in village information points prior to village consultation

17 September	Drop in event at Chideock Village Hall
26 September	Meeting of officers/members. Action plan refined from discussion document and response to consultation
3 October	Action Plan published on website and at information points. Villagers were previously notified. Comments invited by 10 October
7 October	Report to Council's Executive Committee
10 October	Finalised action Plan sent by WDDC to DEFRA and copied to Website

Report Conclusions & Recommendations

The Further Assessment is an opportunity for a local authority to supplement the information they already have on local air quality, and to re-evaluate their AQMA designations. The Further Assessment should be taken forward in parallel with the development of an air quality action plan, and might usefully be seen as a technical annex to the action plan in order to provide scientific justification for the measures in the main body of the plan. A detailed consideration of air quality management options and their cost effectiveness will be required in the Air Quality Action Plan currently being developed by WDDC. This Further Assessment concludes the following:

- **Passive Monitoring**: the diffusion tube monitoring undertaken at three locations since the declaration have identified one area of exceedence (Duck Street), and one close to exceeding the annual objective (Village Hall), this suggests that the AQMA declared is justified and should be retained. The site near the George Inn is under the national objective, however as a pedestrian crossing is proposed in this area in the near future it is recommended that the AQMA boundary is not decreased as the crossing could have a detrimental effect on air quality at this location.

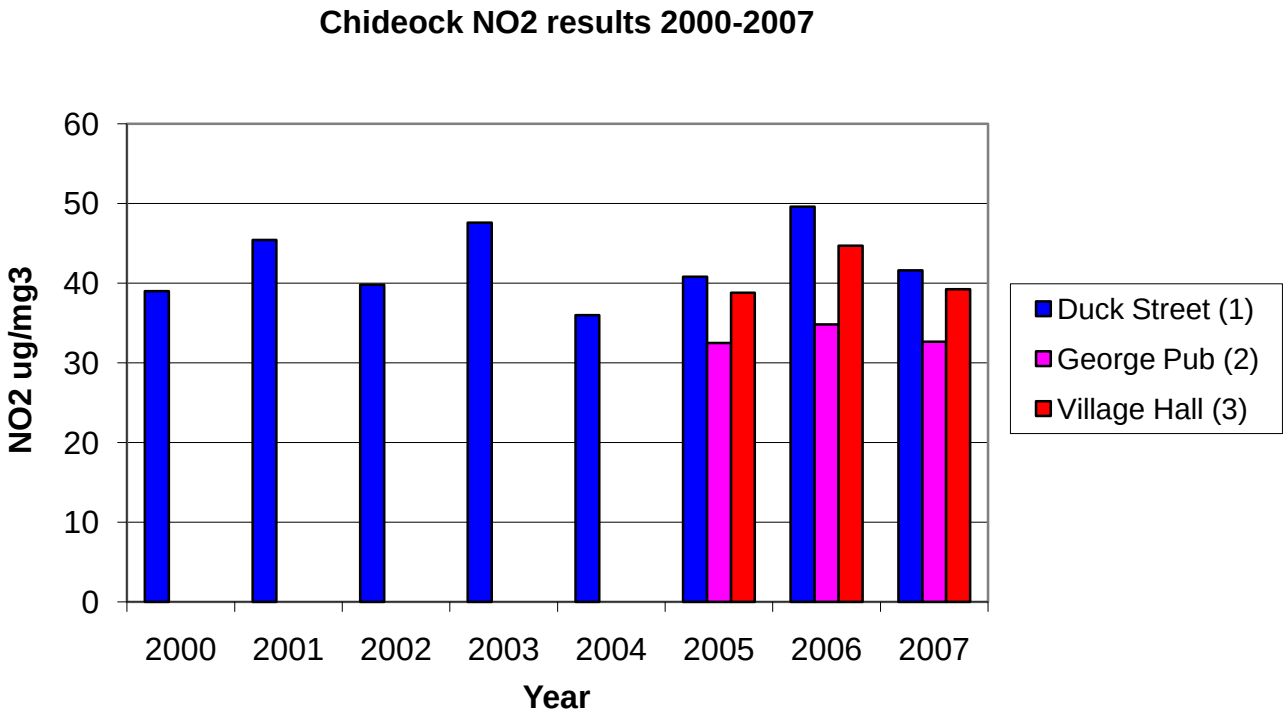
- **Continuous Monitoring:** The continuous monitor will be installed in Chideock by the end of August 2007. A meeting has been set up between WDDC, Highways Agency and Connect in order to finalise a site for the monitor.

- **Source Apportionment:** The source apportionment study would suggest that the percentage reduction in nitrogen dioxide concentrations required relates to the road traffic component only and that a 6% reduction in nitrogen dioxide is needed to meet the national objective set.

- **Improvements required to achieve the objective:** The level of improvement required in order to achieve the annual mean objective for nitrogen dioxide (based on the traffic component only) is approximately 6%. Actions to reduce background concentrations will have a negligible effect; therefore, the majority of actions in the air quality action plan should be directed towards mitigating the road traffic component.

  An annual consideration of the risk that the limit value will not be met by 2010 will be undertaken and a threshold will be set for 2008 and 2009 annual means above which additional measures in the action plan would be implemented. The Contingency plan will develop proportionate action plan measures so that decisions can be made to implement them depending on the result of the annual risk assessment.

Appendix 1 - Chideock Passive Monitoring Results 2000 – 2007 (Bias Adjusted)



Appendix 2 – Monthly Nitrogen Dioxide Results Jan 07 – May 08

(Not Bias Adjusted)