Miller Goodall
Environmental Services

AIR QUALITY ASSESSMENT

on behalf of

EUXTON PARISH COUNCIL

for the site at

LAND OFF PEAR TREE LANE, EUXTON

REPORT DATE: 25th MAY 2011
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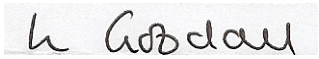
Summary

An assessment of the impact of a proposed development of a number of football pitches, changing rooms and associated car park at Pear Tree Lane, Euxton has been carried out using the methodology within the Design Manual for Road and Bridges. The assessment concludes that the impact of the development on air quality would be classed as imperceptible.

Prepared By	Lesley Goodall	Reviewed By	Joanne Miller
Signed		Signed	
Date	1st June 2011	Date	1st June 2011

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1 Introduction

Miller Goodall Environmental Services Ltd have, on behalf of Euxton Parish Council of 9 Ambleside Avenue, Euxton, Chorley, PR7 6NX, undertaken an air quality assessment with regards to the impact of their proposal to construct changing rooms, and provide two adult football pitches, two junior football pitches and two mini football pitches at a site at Pear Tree Lane, Euxton. A planning application, reference number 11/0053/FULMAJ has been submitted to Chorley Borough Council.

The site is located approximately 900m east of Euxton village centre and 3km to the northwest of Chorley town centre and is currently used as farmland. The proposed playing fields are for the specific use of registered local clubs, not the general public, and the hours of use would be weekends and week day evenings during daylight hours only. This report addresses the impact of the proposal on local air quality. .

Discussions between Lesley Miller of Chorley Borough Council's Environmental Health Department and Steve Maslivec of Miller Goodall Environmental Services Ltd have taken place to approve the methodology for the assessment. The report aims to satisfy the concerns of the local Environmental Health Officer of Chorley Borough Council

2 Local Air Quality Management

Local Air Quality Management (LAQM) in the UK was introduced in the Environment Act 1995. The LAQM regime requires every district and unitary authority to carry out review and assessments of air quality in its area every three years to identify whether health based objectives have been, or will be, achieved at relevant locations, by applicable dates. If this is not the case, the authority must declare an Air Quality Management Area (AQMA) and prepare an Air Quality Action Plan (AQAP) that identifies appropriate measures that will be introduced in pursuit of the health based objectives.

Health based objectives have been established for ten pollutants, with those for seven incorporated in Regulations for use by local authorities. The UK objectives take account of EU limit values and are either effectively identical, or more stringent. Appendix 1 shows these health based criteria.

Air quality can be a material consideration in the planning decision process. National planning policy requires particular attention to be paid to development within or close to areas formally designated as AQMAs.

An assessment for road traffic sources may be carried out using the screening model which has been prepared for the Design Manual for Roads and Bridges (DMRB) and has been published by the Highways Agency[1]. This model can be run to predict pollutant concentrations at receptor locations near to roads. It can be used to predict annual mean concentrations of nitrogen dioxide (NO_2) and PM_{10}, as well as oxides of nitrogen (NO_x), carbon monoxide, benzene and 1,3-butadiene. It also predicts the number of exceedences of 50 g/m^3 as a 24-hour mean PM10 concentration. The model requires input data on annual average daily traffic flow (AADT), annual average speeds, the proportion of different vehicle types, the type of road, and the distance from the centre of the road to the receptor.

[1] ***Design Manual for Roads and Bridges HA 207/07 Volume 11, Section 3, Part 1*** Highways Agency

The DMRB assessment is normally carried using traffic data for the "Do-minimum" (without the scheme) and Do-something (with the scheme) scenarios for the opening year and possibly for a future year. The base case should also be assessed. The objective is to indicate whether there are likely to be any significant effects on local air quality associated with the development or change. In brief, the steps to be taken are as follows;

- Obtain traffic data for the Do-minimum and Do-something scenarios for the years to be assessed
- Identify which roads are likely to be affected by the proposals
- Identify relevant receptors
- Examination of local air quality data
- Calculation for pollutants of concern using the DMRB Air Quality Screening Method spreadsheet for relevant receptors

The results can then be assessed against national guidance. EP-UK guidance[2] provides a methodology by which to describe impact magnitude for changes in pollutant concentration as a percentage of the assessment level for long term objectives for particulate matter and nitrogen dioxide. For changes of +/- 1% the change is described as imperceptible; for between 1 and 5% the change is described as small.

3 Site description and proposed use.

The location of the site is shown in Figure 1. The site comprises two grass fields currently used for farmland and separated by a hedge and ditch line and bounded by hedges and ditches. Mature trees are present within the central hedge line on the site boundaries.

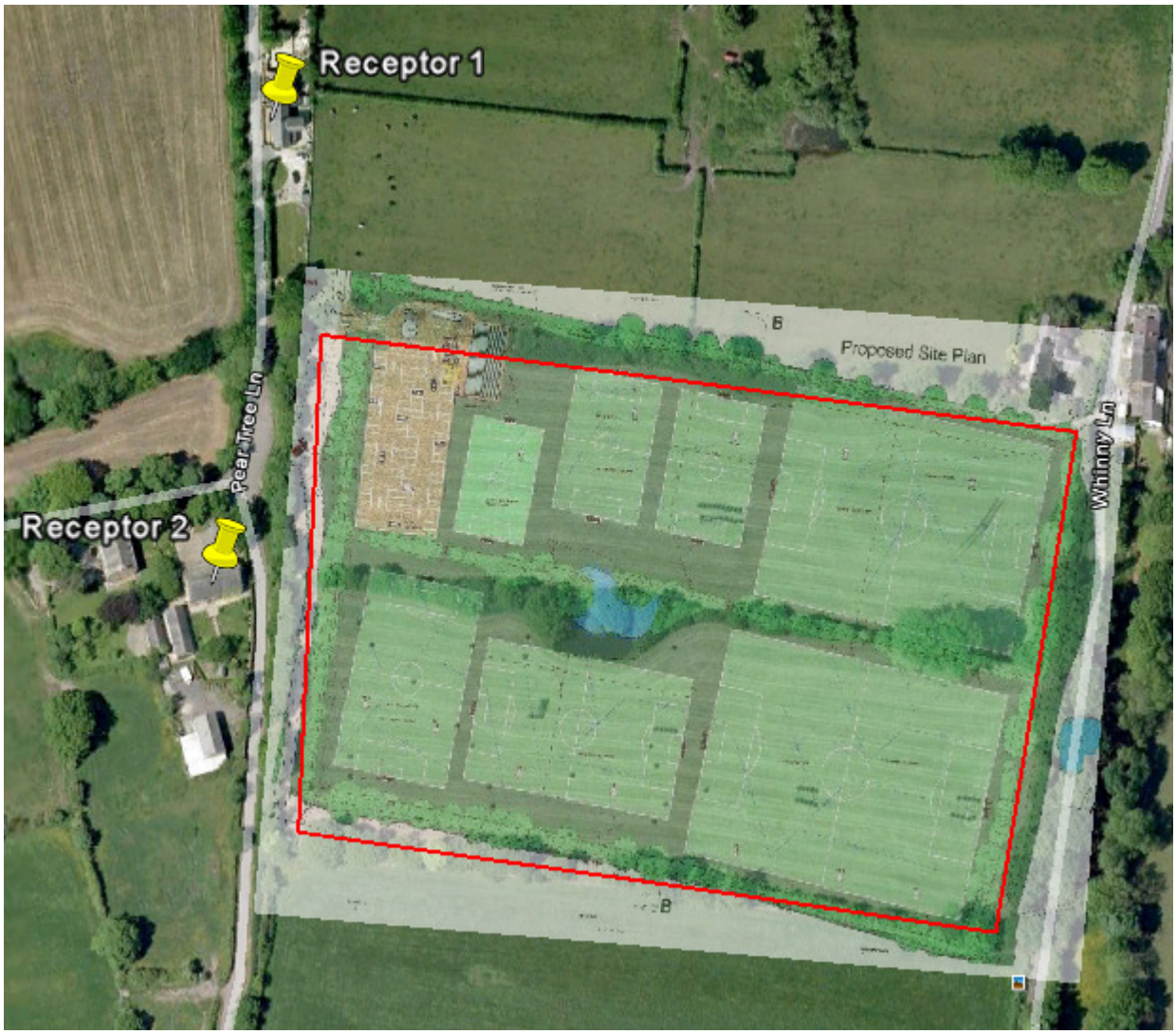
[2] ***Planning for Air Quality*** Environmental Protection UK 2009

Figure 1 : Existing site layout and surrounding residential properties

The site has frontage along Pear Tree Lane and Whinney Lane. Along Pear Tree Lane there is an existing unsurfaced lay-by. The site is bordered on the other two sides by farmland. Access to the fields is currently gained via Whinney Lane on the east of the site.

The total area available for pitches at Pear Tree Lane extends to some 5 ha. The area taken for the proposed car park and changing rooms is some 0.5ha which leaves an area of 4.5 ha for the proposed pitches. A proposed pitch layout for the site which would provide two adult pitches, two junior pitches, two mini-soccer pitches and an all- weather practice pitch has been agreed by all the stakeholders and this is shown in Figure 2 below.

Figure 2: Proposed site plan.



The proposals include creating a new access directly from Pear Tree Lane approximately 40m north of the junction with School lane. The new access will be 5.5m wide with 2.0m footways on both sides leading in to the site. The access is shown in detail at Appendix 2**.** There is potential to provide gates across the access road to secure the car park out of hours to prevent anti-social behaviour on the site. Any gates would be set back so that a car could turn off Pear Tree Lane and open the gate without blocking Pear Tree Lane.

Pear Tree Lane currently has a derestricted speeds limit but it is proposed that the length of Pear Tree Lane is reduced to a 30mph zone. Pear Tree Lane varies between 4.1 m and 4.6 m wide between Euxton Lane and the site and has no footways. It serves residential development on School Lane which links Pear Tree Lane to the A49 in the west. To the south, the lane provides access to further farmland and links to Washington Lane which eventually links to Chorley Town Centre. Beyond the junction with School Lane, Pear Tree Lane narrows considerably to 3.0m.

Pear Tree Lane meets Euxton Lane at a priority junction approximately 180m north of the proposed site access. At the junction, Euxton Lane has one lane in each direction and is within a 30mph zone. The speed limit changes 20m to the east of the junction to 40mph and widens to three lanes at the signalised junction with Central Avenue.

Euxton Lane is a bus route and the nearest bus stops are located 320m and 380m from the proposed site access on Euxton Lane. It is proposed that the site will mainly cater for Euxton Girls and women's' teams and that it will not be available for members of the public. These teams currently use Buckshaw Astra and Holy Cross School for training facilities in the week. The hours of use are weekday evening uses and weekend uses, daylight hours only. This assessment has based the hours of use on:

Monday to Friday	1600 to 2130
Saturday, Sunday and Bank Holidays	0900 to 1700

There are no parking standards for a development of this type and car parking provision has been determined on the basis of the amount of cars which could be expected should all the pitches be in use at the same time. This would involve players from the local area as well as visiting teams from further away. Visiting teams may travel to the site by mini-bus or coach

It is anticipated that the majority of traffic will be from the north via Euxton Lane with a smaller proportion of traffic from School Lane. The traffic generation of the site has been based on the information collected by the existing team manager including the number of players, spectators and number of vehicles.

Typical matches for junior teams attract a maximum of twenty cars per match with 26 players. The mini-soccer typically attracts 20 cars based on twenty players taking part. On average the average trip attraction to the existing sites is 1.79 players per vehicle for matches. In total, the proposed pitches could accommodate 148 players on the basis of 20 players per mini-soccer pitch, 26 players per junior pitch and 28 players on a full size pitch. Based on the average vehicle occupation of 1.79 players per car, if all pitches were in use at the peak time a maximum of 83 cars would be on site.

This level of car occupancy takes into account the fact that some players and spectators will walk, cycle and use public transport to get to the site. Opposition players will come from further away so are more likely to travel to the site by car. However, given the nature of the proposals it is highly likely that parents taking children will car share and drop off a small group of players at a time.

4 Assessment of Air Quality Impact.

4.1 Traffic Data.

No traffic data is available for Pear tree Lane. In terms of Annual Average Daily Traffic (AADT) flows the model has been run using the inputs shown in Table 1 below so as to demonstrate a worst case scenario. AADT represents total volume of vehicle traffic of a road for a year divided by 365 days. In this case the baseline for Pear Tree Lane has been taken as 200 light vehicles per day.

The impact of the development has been taken as 100 new vehicles per day (200 traffic movements) with 5% of those as HGV type vehicles, so as to include coaches. In reality the baseline situation along Pear Tree Lane will include HGV movements (eg tractors), the impact will not be 100 extra vehicles per day, nor will coaches visit the site every day. No additional increase in road traffic is predicted between 2011 and 2012.

Table 1: Traffic Data used in DMRB calculations

Road	*Speed Limit km/hr*	*2011 baseline*	*2012 without*	*2012 with*
Pear Tree Lane	48	200	200	300

Vehicle emission rates are calculated as a function of average speed. The highest emissions are normally associated with slow speed, congested driving conditions with the lowest emissions during steady speed operation at a speed of around 60-80 km/h. To allow for the reduced speeds of vehicles accessing and egressing the site the annual average speed has been set to 8 km/hour (5mph) within the calculations. Again it is suggested that this is a worst case scenario.

4.2 Relevant receptors

Given the position of the proposed access to the site it is considered that the potential for air quality impacts from the development occurs on Pear Tree Lane. Two receptors have been identified for the assessment and the position of these is shown in Figure 2 above. The distance from the receptors to the centre of the road has been set as 5m within the calculations.

4.3 Local air quality data

The development site lies within Chorley Borough Council (Chorley BC). There have been periodic reviews and assessments of local air quality carried out by the local authority but there have been no Air Quality Management Areas declared within the administrative boundaries of Chorley BC.

There are no automatic monitoring sites within the boundaries of Chorley BC but diffusion tubes have been used within the area for a number of years. The nearest tube to the development for which data is available is at Shawbrook Close, Euxton approximately 1 km to the northwest of the site and located some 300 to 400 away from the M6 motorway and thus unrepresentative of this site. For completeness the results for this tube are shown in Table 2 below;

Table 2: Results from diffusion tube at Shawbrook Close, Euxton

Year	*Annual average concentration Nitrogen Dioxide µgm^3*
2008	23.35
2007	20.07
2006	26.20

Since 2008 the diffusion tube network has been reviewed and new sites introduced. The new network of tubes are shown in Table 3 below.

Table 3. Nitrogen Dioxide Diffusion tube sites in Chorley

Tube Number	Location	AADTF (year)
CH01	Moulden Brow, Fenniscowles (LP14)	12981
CH02	Blackburn Old Road, Houghton (LP 35 end Rock Gardens)	17700 (2007)
CH03	A674 Blackburn Road, Higher Wheelton (LP 60)	13540
CH04	Eaves Lane (LP 40 end Nab Road)	12150 (2000)
CH05	Market Street, Adlington (LP 16)	11233
CH06	Moor Road, Chorley (LP 50 end Cross Swords)	18373 (2000)
CH07	Southport Road, Chorley (LP 21 opp end Belvedere)	13103 (2005)
CH08	Balshaw Lane (LP 82)	18122 (2007)
CH09	A49 Wigan Road South Balshaw Lane (LP 12)	15244 (2007)
CH10	Southport Road, Croston (LP 11)	9900 (2001)
CH11	A49 Wigan Road South Euxton Lane (LP 47 (O/S 152)	11490 (2007)
CH12	Euxton Lane (LP 99)	10300 (2007)
CH13	A5083 Lydiate Lane (LP 3) Adjacent to M6 motorway	
CH14	A49 Wigan Road (LP 129 Lancaster Lane Junction)	16804 (2002)
CH15	Sheephill Lane, Clayton (LP 20 end Woodend rd)	11210 (2008)
CH16	A6 Clayton – Whittle (LP 456 End Radburn Brow)	15237 (2008)
CH17	A6 Whittle (LP 420)	13839 (2000)
CH18	A6 Whittle (LP 374 South Shaw Brow)	14254 (2008)
CH19	A6 at Chorley Hospital (LP 307)	27756 (2003)
CH20	A6 South Chorley Hospital, (LP 251)	21708 (2001)

The closest sites to the application site are CH11 and CH12 but no data for these tubes has been published as yet.

The National Environmental Technology Centre (Netcen) has modeled the background concentration of seven pollutants on a 1 km by 1 km grid based on known pollutant sources and background measurements. This modeling includes local road traffic. The averages predicted concentrations at the grid point 356500, 419500 close to the site for nitrogen dioxide and particulate matter are shown in Table 4 below.

Table 4: Netcen background concentration (Annual average concentration µgm^3)

Pollutant	*2009*	*2010*	*2011*	*2012*
Nitrogen dioxide	15.6	14.5	14.0	13.3
PM_{10}	13.6	13.3	13.1	13.0

These figures have been used in the DMRB assessment.

5 DMRB Calculations

Since the receptors have been treated equally (eg both treated as at 5 m from the centre of the road and all other parameters the same) only one calculation has been necessary. A screen shot of the DMRB calculation is shown in Appendix 3. A summary of the results is shown in table 5 below.

Table 5: results of DMRB assessment (Annual average concentration µgm^3)

Receptor	*2011 Baseline*		*2012 Without*		*2012 With*	
	NO_2	PM_{10}	NO_2	PM_{10}	NO_2	PM_{10}
1	14.0	13.1	13.3	13.0	13.5	13.04

6 Conclusion

The results show that increases in annual average concentrations of 0.2 µgm^3 and 0.04 µgm^3 for nitrogen dioxide and PM_{10} respectively may occur if the development were to proceed. These increases are classed as of imperceptible magnitude within current national guidance.

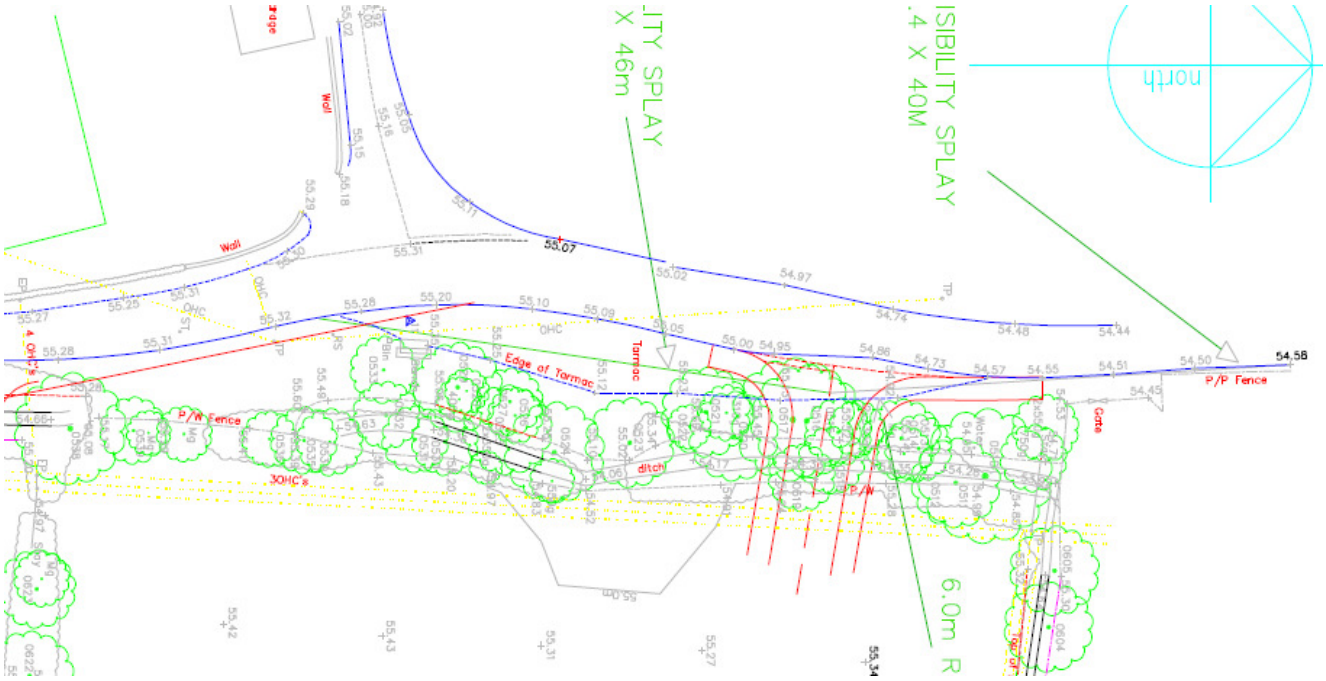
Glossary of Terms

Appendix 1 Health Based Air Quality Objectives

Pollutant	Objective	Measured as
Benzene	16.25 µg/m³	Running Annual Mean
	5 µg/m³	Annual Mean
1,3-Butadiene	2.25 µg/m³	Running Annual Mean
Carbon Monoxide	10 mg/m³	Maximum daily running 8 Hour Mean
Lead	0.5 µg/m³	Annual Mean
	0.25 µg/m³	Annual Mean
Nitrogen Dioxide	200 µg/m³ Not to be exceeded more than 18 times per year	1 Hour Mean
	40 µg/m³	Annual Mean
Particles (PM_{10}) (gravimetric)	50 µg/m³ Not to be exceeded more than 35 times per year	24 Hour Mean
	40 µg/m³	Annual Mean
Sulphur dioxide	266 µg/m³ Not to be exceeded more than 35 times per year	15 Minute Mean
	350 µg/m³ Not to be exceeded more than 24 times per year	1 Hour Mean
	125 µg/m³ Not to be exceeded more than 3 times per year	24 Hour Mean
Ozone (Provisional)	100 µg/m³ Not to be exceeded more than 10 times per year	Daily maximum of running 8 hr mean
PAHs(Benz-a-Pyrene)	0.25 ng/m³	Annual Mean
Particles (PM2.5) (gravimetric)	25 µg/m³	Annual Mean
	15% reduction in concentrations at urban background locations	3-year Mean

NB a µg/m³ is a unit of measurement. It is micrograms (one-millionth of a gram) per cubic meter of air. A ng/m³ is a nanogram (10^{-9}) per cubic meter of air

Appendix 2. Proposed Access to the Site



Appendix 3 Screen shots from DMRB Calculation

DMRB calculation results for Receptors 1 and 2 for 2012 with the development.

DMRB: Assessment of Local Air Quality

Current receptor

Receptor Name	Pear Tree Lane 1	Receptor number	1
Assessment year	2012		

Results

Pollutant	Annual mean				For comparison with Air Quality Standards		
	Background concentration	Road traffic component	Total	Units	Metric	Value	Units
CO	0.00	0.00	0.00	mg/m^3	Annual mean*	0.00	mg/m^3
Benzene	0.00	0.00	0.00	$\mu g/m^3$	Annual mean	0.00	$\mu g/m^3$
1,3-butadiene	0.00	0.00	0.00	$\mu g/m^3$	Annual mean	0.00	$\mu g/m^3$
NO_x	0.0	0.3	0.3	$\mu g/m^3$	Not applicable		
NO_2	13.3	0.2	13.5	$\mu g/m^3$	Annual mean*	13.5	$\mu g/m^3$
PM_{10}	13.0	0.04	13.04	$\mu g/m^3$	Annual mean	13.0	$\mu g/m^3$
					Days >50$\mu g/m^3$	0	Days

* See Footnote 32 in DMRB Volume 11 Chapter 3