



2012 Air Quality Updating and Screening Assessment for *Dacorum Borough Council*

In fulfillment of Part IV of the
Environment Act 1995
Local Air Quality Management

April 2012

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Executive Summary

Part IV of the Environment Act 1995 requires each local authority to review and assess air quality within its geographical area. Predicted concentrations for seven key pollutants; carbon monoxide, lead, benzene, 1,3-butadiene, nitrogen dioxide, sulphur dioxide and PM₁₀ particles must be compared against the standards and objectives specified in the Air Quality Regulations 2000 (as amended).

In each case, the review and assessment for each pollutant has been carried out in accordance with the methodology laid out in Technical Guidance LAQM.TG(03) & (05) for that specific pollutant, contrasting known and predicted/calculated pollution data with targets set out in the Regulations.

Although national data shows a decline in air pollution levels in recent years, there is still a concern about potential hot spots mainly related to road transport emissions and certain industrial processes. In the Dacorum Borough and generally across Hertfordshire, industrial sources only represent a small percentage of total emissions for most air pollutants. Road transport is the main source of local air pollution within the region.

This Updating and Screening Assessment (USA) provides an update with respect to air quality issues within Dacorum borough since the forth round of Review and Assessment. This is the fifth round of Review and Assessment.

The Updating and Screening Assessment has indicated that annual mean NO₂ concentrations continue to exceed the relevant air quality objective in the three previously identified (to be declared) AQMAs (at Lawn Lane, Hemel Hempstead; London Road, Apsley and High street, Northchurch). Since 2009, annual mean NO₂ concentrations greater than the relevant air quality objective have also been recorded outside of the (to be declared) AQMAs at Watford Road, Kings Langley (DC54); High Street, Berkhamsted (DC47) and Sappi 2 (DC81). However, it has been determined that there is no relevant exposure at these three locations and therefore no requirement to proceed to a detailed assessment(s) for annual mean NO₂.

Formal declaration of the three proposed AQMAs in relation to the annual mean air quality objective for NO₂ is now imminent.

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1 Introduction

1.1 Description of Local Authority Area

Dacorum borough comprises a mix of urban and rural land uses situated on the western edge of Hertfordshire. Located approximately 30 miles northwest of central London, the borough has a population of approximately 138,400¹, which is predominantly centred on the towns of Berkhamsted, Hemel Hempstead and Tring.

Major roads within the area include the M1, which crosses the eastern side of the borough, the M25, which is located near the southern boundary of the borough, and the A41, which closely bypasses Berkhamsted, Hemel Hempstead and Tring, linking Aylesbury to the west with Watford to the east. The area is well connected to London and the midlands via a major rail link that traverses the borough and terminates at London Euston.

The main source of air pollution within the borough is generated from road traffic. Although there are no other major sources of air pollution from industrial processes within the borough, there are 45 Part B Installations permitted by Dacorum Borough Council under the Environmental Permitting Regulations 2010 and one Part A(2) Installation. There is also one Part A(1) Installation permitted by the Environment Agency. These are listed in **Appendix A**.

1.2 Purpose of Report

This report fulfils the requirements of the Local Air Quality Management process as set out in Part IV of the Environment Act (1995), the Air Quality Strategy for England, Scotland, Wales and Northern Ireland 2007 and the relevant Policy and Technical Guidance documents. The LAQM process places an obligation on all local authorities to regularly review and assess air quality in their areas, and to determine whether or not the air quality objectives are likely to be achieved. Where exceedences are considered likely, the local authority must then declare an Air Quality Management Area (AQMA) and prepare an Air Quality Action Plan (AQAP) setting out the measures it intends to put in place in pursuit of the objectives.

The objective of this Updating and Screening Assessment is to identify any matters that have changed which may lead to risk of an air quality objective being exceeded. A checklist approach and screening tools are used to identify significant new sources or changes and whether there is a need for a Detailed Assessment. The USA report should provide an

¹ Office of National Statistics 2006

update of any outstanding information identified in previous in Review and Assessment reports.

1.3 Air Quality Objectives

The air quality objectives applicable to LAQM in England are set out in the Air Quality (England) Regulations 2000 (SI 928), The Air Quality (England) (Amendment) Regulations 2002 (SI 3043), and are shown in **Table 1.1**. This table shows the objectives in units of microgrammes per cubic metre $\mu\text{g}/\text{m}^3$ (milligrammes per cubic metre, mg/m^3 for carbon monoxide) with the number of exceedences in each year that are permitted (where applicable).

Table 1.1 Air Quality Objectives included in Regulations for the purpose of LAQM in England

Pollutant	Air Quality Objective		Date to be achieved by
	Concentration	Measured as	
Benzene	16.25 $\mu\text{g}/\text{m}^3$	Running annual mean	31.12.2003
	5.00 $\mu\text{g}/\text{m}^3$	Running annual mean	31.12.2010
1,3-Butadiene	2.25 $\mu\text{g}/\text{m}^3$	Running annual mean	31.12.2003
Carbon monoxide	10.0 mg/m^3	Running 8-hour mean	31.12.2003
Lead	0.5 $\mu\text{g}/\text{m}^3$	Annual mean	31.12.2004
	0.25 $\mu\text{g}/\text{m}^3$	Annual mean	31.12.2008
Nitrogen dioxide	200 $\mu\text{g}/\text{m}^3$ not to be exceeded more than 18 times a year	1-hour mean	31.12.2005
	40 $\mu\text{g}/\text{m}^3$	Annual mean	31.12.2005
Particles (PM_{10}) (gravimetric)	50 $\mu\text{g}/\text{m}^3$, not to be exceeded more than 35 times a year	24-hour mean	31.12.2004
	40 $\mu\text{g}/\text{m}^3$	Annual mean	31.12.2004
Sulphur dioxide	350 $\mu\text{g}/\text{m}^3$, not to be exceeded more than 24 times a year	1-hour mean	31.12.2004
	125 $\mu\text{g}/\text{m}^3$, not to be exceeded more than 3 times a year	24-hour mean	31.12.2004
	266 $\mu\text{g}/\text{m}^3$, not to be exceeded more than 35 times a year	15-minute mean	31.12.2005

1.4 Summary of Previous Review and Assessments

Dacorum Borough Council has undertaken and completed the following rounds of LAQM review and assessment, as summarised in **Table 1.2** and discussed below:

Table 1.2 Summary of previous review and assessments

Report	Date	Outcomes
Updating and Screening Assessment	2003	No exceedances of the specified pollutants. No requirement for progression to detailed assessment.
Progress Report	2005	Report not available
Updating and Screening Assessment	2006	Identified potential breaches of 2005 annual mean air quality objective for NO ₂ at 3no. locations. Proceed to Detailed Assessment.
Detailed Assessment	2007	Detailed assessment of NO ₂ concentrations in 3no. locations. Concluded that 3no. AQMAs should be declared.
Updating and Screening Assessment	2009	Annual mean NO ₂ concentrations continue to exceed the relevant air quality objective at three previously identified AQMAs.
Progress Report	2010	Annual mean NO ₂ concentrations continue to exceed the relevant air quality objective at three previously identified AQMAs.
Progress Report	2011	Annual mean NO ₂ concentrations continue to exceed the relevant air quality objective at three previously identified AQMAs.

The 2003 Updating and Screening Assessment (USA) indicated that detailed assessments for carbon monoxide, benzene, 1,3-butadiene, lead, NO₂, PM₁₀ and sulphur dioxide, at the time, were not required.

The 2005 Progress Report, which covered the period 2003 to 2004 was not available at the time of writing.

The 2006 Updating and Screening Assessment (USA) indicated that detailed assessments for NO₂, PM₁₀ and other important pollutants were, at the time, not required. However,

diffusion tube monitoring data did indicate that the 2005 annual mean air quality objective for NO₂ would potentially be breached at three locations within the borough (London Road, Apsley; Lawn Lane, Hemel Hempstead and High Street, Northchurch).

Consequently, in 2007, a detailed assessment of the three areas was completed on behalf of Dacorum Borough Council by Air Quality Consultants Ltd. This study concluded that Air Quality Management Areas (AQMAs) should be declared for the NO₂ annual mean air quality objective at all three locations.

The required April 2008 Progress Report (covering the 2007 period) was not produced by the Council. It was intended that the 2009 Updating and Screening Assessment would provide an update on air quality monitoring and highlight any significant changes since the previous Updating and Screening Assessment produced in 2006.

The 2009 Updating and Screening Assessment (USA) undertaken by RSK Group indicated that annual mean nitrogen dioxide (NO₂) concentrations continued to exceed the relevant air quality objective at three previously identified locations (at London Road, Apsley; Lawn Lane, Hemel Hempstead and High Street, Northchurch). It was not considered necessary to proceed to detailed assessment for any other pollutants or to consider declaration of additional AQMAs at other locations within the borough.

In addition to the 2009 USA, Dacorum Borough Council commissioned RSK Group to undertake a detailed dispersion modelling assessment of PM₁₀ emissions in the three identified areas which were planned to be declared AQMAs. The results of the modelling study indicated that both long and short term concentrations of PM₁₀ are anticipated to meet relevant air quality objectives in the study areas assessed.

The 2010 Progress Report again undertaken by RSK Group identified that annual mean NO₂ concentrations continued to exceed the relevant air quality objective at the three previously identified areas. The report concluded that it was not considered necessary to proceed to a detailed assessment for any other pollutants or to consider the declaration of additional AQMAs at other locations within the borough. The redevelopment and commencement of operations at the Buncefield depot was identified as requiring consideration within the 2012 Updating and Screening Assessment.

The 2011 Progress Report again undertaken by RSK Group identified that annual mean NO₂ concentrations continued to exceed the relevant air quality objective at the three previously

identified areas. It is not considered necessary to proceed to a detailed assessment for any other pollutants or to consider the declaration of additional AQMAs at other locations within the borough. Again, the redevelopment and commencement of operations at the Buncefield depot was identified as requiring consideration within the 2012 Updating and Screening Assessment. A waste transfer station at Maxted Road, Hemel Hempstead was also noted by this report. Emissions from this site were identified as requiring consideration within the 2012 Updating and Screening Assessment.

Formal declaration of the three previously identified AQMAs in relation to the annual mean air quality objective for NO₂ is now imminent. The areas were agreed at a Dacorum Borough Council cabinet meeting in July 2011, which was followed by a 3-month consultation period (ending in October 2011), and approved at a Dacorum Borough Council overview and scrutiny committee meeting in December 2011.

2 New Monitoring Data

2.1 Summary of Monitoring Undertaken

The following section provides information on ambient air quality monitoring undertaken in the borough since the last Updating and Screening Assessment was produced in 2009.

2.1.1 Automatic Monitoring Sites

No automatic monitoring has been undertaken within Dacorum borough since the last Updating and Screening Assessment in 2009. An automatic nitrogen oxides (NO_x) roadside monitoring station has been installed at the High Street, Northchurch (within one of the areas to be declared an AQMA). This monitoring site is expected to be commissioned during 2012. Monitoring data from this automatic monitoring station will be reported in future LAQM reports.

Dacorum Borough Council is a member of the Hertfordshire and Bedfordshire Air Quality Network, which benefits from the co-ordinated monitoring of air pollutants across the region. The Hertfordshire and Bedfordshire Air Quality Network is managed and co-ordinated by Air Quality Data Management (AQDM), on behalf of the Hertfordshire and Bedfordshire Air Quality Network, and they provide data calibration and ratification of results. There are fourteen automatic air quality monitoring stations currently operational within Hertfordshire and Bedfordshire. These are listed in **Table 2.1** below.

Table 2.1 Hertfordshire and Bedfordshire Air Quality Network Automatic Monitoring Stations and Pollutants Monitored

	Authority	Location	Site Type	Pollutants
1	Bedford Borough Council	Lurke Street	Roadside	NO ₂
2	Bedford Borough Council	Prebend Street	Roadside	NO ₂
3	Central Bedfordshire Council	Marston Vale	Rural	O ₃
4	Central Bedfordshire Council/AURN	Sandy Roadside	Roadside	NO ₂ , PM ₁₀ , PM _{2.5}
5	East Hertfordshire District Council	Anstey	Rural	O ₃
6	East Hertfordshire District Council	Sawbridgeworth Background	Urban Background	NO ₂ , PM ₁₀
7	East Hertfordshire District Council	Sawbridgeworth Roadside	Roadside	NO ₂ , PM ₁₀
8	Luton Borough Council	Luton Airport	Airport	PM ₁₀
9	Luton Borough Council	Challney Community College	Urban Background	NO ₂ , O ₃ , PM ₁₀
10	North Hertfordshire District Council	Baldock Roadside	Roadside	NO ₂
11	North Hertfordshire District Council	Hitchin Library	Roadside	NO ₂ , PM ₁₀
12	Stevenage Borough Council	Lytton Way	Roadside	NO ₂ , PM ₁₀
13	Watford Borough Council	Town Hall	Roadside	NO ₂ , PM ₁₀
14	Welwyn Hatfield Borough Council	Council Offices	Urban Background	NO ₂ , O ₃

2.1.2 Non-Automatic Monitoring Sites

Dacorum Borough Council measures ambient NO₂ concentrations using passive diffusion tubes at a number of kerbside, roadside and background locations. The diffusion tube monitoring network was augmented in December 2010 with a further 10 diffusion tubes monitoring sites (DC67 to DC76) mostly in, or within the immediate vicinity of the (to be declared) AQMA boundaries in Hemel Hempstead and Apsley. A further 9 diffusion tube monitoring sites were also deployed in Hemel Hempstead in 2011; DC77 to DC82 were commissioned in May 2011; DC83 and DC84 in June 2011 and DC85 in September 2011. 3no. monitoring sites (DC77 to DC79) were positioned at various locations on Cotterells, Hemel Hempstead to access any potential air quality impact following the redevelopment of the former Kodak site (4/0279/09/MFA). 3no. monitoring sites (DC80 to DC82) were positioned at various locations on Lower Road, Nash Mills to access air quality within the vicinity of the former Sappi Graphics site, which is undergoing redevelopment under planning permission 4/01382/09/MFA (residential / mixed end use). Construction works are nearing completion. The Sawyers Way diffusion tube, which had previously been subjected to vandalism, has remained in-situ. In total, NO₂ is now measured at 41 different sites across the borough. These locations are listed in **Table 2.2**.

The NO₂ diffusion tubes are supplied and analysed by Harwell Scientifics, Didcot, Oxfordshire, and are prepared using the 50:50 (acetone:triethanolamine) method. Harwell Scientifics follow the procedures set out in the Practical Guidance document and, according to the QA/QC Framework webpage of the Defra website². In the Workplace Analysis Scheme for Proficiency (WASP) inter-comparison scheme for comparing spiked Nitrogen Dioxide diffusion tubes, Harwell Scientifics is currently ranked as a 'Category Good' laboratory.

No local authority co-location studies have been undertaken within Dacorum borough since the 2009 Updating and Screening Assessment was produced. Annual average NO₂ concentrations presented in this report have been bias adjusted using the following factors, all of which were obtained from the national bias adjustment spreadsheet available from the DEFRA website³:

- 2009: 0.82 (derived from 9 co-location studies)
- 2010: 0.85 (derived from 18 co-location studies)
- 2011: 0.84 (derived from 18 co-location studies)

No other air pollutants are monitored using either automatic or non-automatic techniques within the local authority area.

² <http://laqm.defra.gov.uk/diffusion-tubes/qa-qc-framework.html>

³ <http://laqm.defra.gov.uk/bias-adjustment-factors/national-bias.html>

Table 2.2 Details of Non-Automatic Monitoring Sites

Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Is monitoring collocated with a Continuous Analyser (Y/N)	Relevant Exposure? (Y/N with distance (m) to relevant exposure)	Distance to kerb of nearest road (N/A if not applicable)	Does this location represent worst-case exposure?
Sawyers Way, Hemel Hempstead	Background	506780	207180	NO ₂	N	N	Y (5m)	2m	N
Wood Lane End, Hemel Hempstead	Background	508177	207934	NO ₂	N	N	Y (12m)	1m	N
Roman Way, Markyate	Background	506197	216506	NO ₂	N	N	N (10m)	58m	N
High Street, Bovingdon	Kerbside	501541	203659	NO ₂	N	N	Y (13m)	N/A	N
High Street, Berkhamsted	Roadside	499365	207724	NO ₂	N	N	N (20m)	N/A	N
Prince Edwards Street, Berkhamsted	Background	499207	207754	NO ₂	N	N	N (12m)	35m	N
High Street, Northchurch	Roadside	497346	208835	NO ₂	TBD	N	Y (1m)	N/A	Y
Brook Street, Tring	Kerbside	492552	211824	NO ₂	N	N	Y (8m)	N/A	N
High Street, Tring	Roadside	492335	211386	NO ₂	N	N	N (30m)	N/A	N
Charles Street, Tring	Background	492195	211159	NO ₂	N	N	N (2m)	50m	N
Watford Road, Kings Langley	Roadside	507606	201624	NO ₂	N	N	N (34m)	N/A	N
High Street, Kings Langley	Roadside	507184	202690	NO ₂	N	N	N (15m)	N/A	N
Lawn Lane 1 Hemel Hempstead	Roadside	505923	205761	NO ₂	TBD	N	Y (2m)	N/A	N
Gammons Lane, Hemel Hempstead	Background	507058	206727	NO ₂	N	N	N (6m)	22m	N
Wadley Close, Hemel Hempstead	Background	506981	206829	NO ₂	N	N	N (10m)	11m	N
Field Road, Hemel Hempstead	Background	507483	206898	NO ₂	N	N	Y (1m)	17m	N
St Agnells Lane, Hemel Hempstead	Roadside	507121	209252	NO ₂	N	N	Y (10m)	1m	N
New Road, Northchurch	Roadside	497335	208860	NO ₂	TBD	N	Y (1m)	N/A	Y
Darrs Lane, Northchurch	Roadside	497264	208927	NO ₂	TBD	N	Y (5m)	1m	N
Lawn Lane 2, Hemel Hempstead	Roadside	505969	205726	NO ₂	TBD	N	Y (8m)	1m	N
Lawn Lane 3, Hemel Hempstead	Roadside	505930	205740	NO ₂	TBD	N	Y (1m)	1m	Y
London Road, Apsley	Roadside	505674	205514	NO ₂	TBD	N	Y (1m)	1m	Y
Allandale	Roadside	505948	207814	NO ₂	N	N	N (16m)	1m	Y
Belswains Sappi	Roadside	507005	204677	NO ₂	N	N	N (3m)	1m	Y

Dacorum Borough Council

Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Is monitoring collocated with a Continuous Analyser (Y/N)	Relevant Exposure? (Y/N with distance (m) to relevant exposure)	Distance to kerb of nearest road (N/A if not applicable)	Does this location represent worst-case exposure?
Lawn Lane, Belswains	Background	506053	205664	NO ₂	IV	N	Y (8m)	25m	N
Lawn Lane 4, Hemel Hempstead	Roadside	505888	205801	NO ₂	IV	N	Y (6m)	2m	Y
Orchard Street	Kerbside	505636	205504	NO ₂	IV	N	N (3m)	1m	Y
London Featherbed	Roadside	505603	205612	NO ₂	IV	N	Y (5m)	2m	Y
Durrants Hill Road	Roadside	505734	205519	NO ₂	TBD	N	Y (1m)	2m	Y
Avia Close	Roadside	505841	205395	NO ₂	TBD	N	N (6m)	1m	Y
The Meads	Roadside	497472	208730	NO ₂	N	N	N (10m)	2m	Y
The Cotterells	Kerbside	505355	206504	NO ₂	N	N	Y (5m)	1m	Y
Cotterells 1	Roadside	505331	206350	NO ₂	N	N	Y (3m)	2m	Y
Cotterells 2	Roadside	505331	206411	NO ₂	N	N	N (3m)	1m	Y
Cotterells 3	Roadside	505338	206594	NO ₂	N	N	Y (2m)	2m	Y
Sappi 1	Roadside	507132	204450	NO ₂	N	N	N (5m)	1m	Y
Sappi 2	Roadside	507122	204470	NO ₂	N	N	N (10m)	1m	Y
Sappi 3	Roadside	507105	204548	NO ₂	N	N	Y (2m)	4m	N
Briar Way	Background	499626	207031	NO ₂	N	N	Y (8m)	1m	N
AQ Machine	Kerbside	497290	208904	NO ₂	TBD	N	N (10m)	1m	Y
Health Centre, London Road	Kerbside	505663	205528	NO ₂	TBD	N	Y (4m)	1m	Y

Note:

TBD Within (to be declared) AQMAs

IV Within immediate vicinity of (to be declared) AQMA boundaries

2.2 Comparison of Monitoring Results with AQ Objectives

The following section compares NO₂ diffusion tube monitoring results with relevant air quality objectives. Only annual mean NO₂ data are presented, as no other parameters / averaging periods have been monitored / assessed in Dacorum borough.

2.2.1 Nitrogen Dioxide

Automatic Monitoring Data

No automatic monitoring of NO₂ has been undertaken with Dacorum borough to date.

Diffusion Tube Monitoring Data (2011)

Table 2.3 below presents annual mean NO₂ concentrations as measured at the 41 diffusion monitoring sites in 2011. Annual mean concentrations for 2011 have been bias adjusted by applying the factor of 0.84 referenced above in section 2.1.2. Exceedances of the annual mean air quality objective for NO₂ highlighted in red.

Due to low data capture (<75 per cent) apparent at 9 of the 41 diffusion tube monitoring sites for the 2011 calendar year, the measured mean NO₂ concentrations were adjusted to estimate an annual mean concentration ('annualised') using the methodology outlined in Box 3.2 of LAQM.TG(09). Specifically, mean annual mean/period ratios were derived from 2011 measurement data from two long-term, continuous monitoring stations (urban background sites) within 50 miles of the diffusion tube sites and were applied to the measured NO₂ concentrations prior to bias adjustment.

The diffusion tube measurement data for 2011 indicates that the annual mean air quality objective for NO₂ was exceeded at seven of the 41 monitoring locations within the borough. Specifically, New Road, Northchurch (DC62), Lawn Lane 1, Hemel Hempstead (DC57), Lawn Lane 3, Hemel Hempstead (DC65), London Road, Apsley (DC66), Avia Close (DC74), Watford Road, Kings Langley (DC54) and Sappi 2 (DC81) with annual mean NO₂ concentrations of 46.2µg/m³, 53.2µg/m³, 57.2µg/m³, 59.2µg/m³, 42.1µg/m³, 46.7µg/m³ and 52.3µg/m³ respectively. With the exception of Watford Road, Kings Langley (DC54) and Sappi 2 (DC81), all other exceedances identified are situated within the (to be declared) AQMAs.

As identified in **Table 2.2**, no relevant exposure is apparent at either the Watford Road, Kings Langley (DC54) site or the Sappi 2 (DC81) site. Following the guidance/calculation

outlined in Box 2.3 of LAQM.TG(09), annual average NO₂ concentrations at the nearest receptors/sites of relevant exposure to the DC54 and DC81 monitoring sites is estimated to be 31.6µg/m³ and 34.8µg/m³ respectively, and therefore below the relevant air quality objective. It should be noted that the annual mean concentration for Sappi 2 (DC81) was estimated using the methodology outlined in Box 3.2 of LAQM.TG(09) as only a short-term period of monitoring data (May to December) was available for the 2011 calendar year.

No exceedance of the annual mean air quality objective for NO₂ was observed at the other diffusion tube monitoring stations in 2011.

Annual mean NO₂ concentration of 39.3µg/m³ and 39.9µg/m³ (i.e. approaching the relevant air quality objective) were recorded at Lawn Lane 2 Hemel Hempstead (DC64) and Lawn Lane 4 Hemel Hempstead (DC70) respectively. As identified in Table 2.1, Lawn Lane 2 Hemel Hempstead (DC64) is located within the (to be declared) Lawn Lane AQMA. Lawn Lane 4 Hemel Hempstead (DC70) is located just outside of the (to be declared) Lawn Lane AQMA. An annual mean NO₂ concentration of 39.2µg/m³ was recorded at High Street Berkhamsted (DC47). However, as identified in **Table 2.1**, no relevant exposure is apparent at this site. An annual mean NO₂ concentration of 38.2µg/m³ was recorded at Belswains Sappi (DC68) and 37.2µg/m³ at Sappi 1 (DC80).

Section 2.34 of LAQM.TG(09) indicates that if annual mean NO₂ concentrations are 60µg/m³ or above, then it is likely that exceedances of the 1-hour mean air quality objective for NO₂ will occur. Annual mean NO₂ concentrations at all the 41 monitoring sites were below 60µg/m³ in 2011. The annual mean NO₂ concentration at London Road, Apsley (DC66) in 2011 was highest at 59.2µg/m³.

Appendix B presents, for 2011, monthly mean NO₂ measurement data for each diffusion tube site and the annual mean/period mean ratios that were used to calculate the annualised mean NO₂ concentrations presented in **Table 2.3**.

Table 2.3 Results of Nitrogen Dioxide Diffusion Tubes in 2011

Site ID	Location	Site Type	Within AQMA ?	Triplicate or Collocated Tube	Data Capture 2011 (%)	Data with less than 9 months has been annualised (Y/N)	Confirm if data has been distance corrected (Y/N)	Annual mean concentration (Bias Adjustment factor = 0.84) 2011 ($\mu\text{g}/\text{m}^3$)
DC40	Sawyers Way, HH	Background	N	N	100	N	N	24.2
DC42	Wood Lane End, HH	Background	N	N	100	N	N	24.7
DC43	Roman Way, Markyate	Background	N	N	75	N	N	18.5
DC46	High Street, Bovington	Kerbside	N	N	92	N	N	22.4
DC47	High Street, Berkhamsted	Roadside	N	N	100	N	N	39.2
DC48	Prince Edward Street, Berkhamsted	Background	N	N	100	N	N	20.8
DC50	High Street, Northchurch	Roadside	TBD	N	100	N	N	35.8
DC51	Brook Street, Tring	Kerbside	N	N	92	N	N	27.4
DC52	High Street, Tring	Roadside	N	N	100	N	N	33.6
DC53	Charles Street, Tring	Background	N	N	100	N	N	15.7
DC54	Watford Road, Kings Langley	Roadside	N	N	100	N	N	46.7
DC55	High Street, Kings Langley	Roadside	N	N	92	N	N	34.0
DC57	Lawn Lane 1, HH	Roadside	TBD	N	100	N	N	53.2
DC58	Gammons Lane, HH	Background	N	N	100	N	N	28.6
DC59	Wadley Close, HH	Background	N	N	92	N	N	35.2
DC60	Field Road, HH	Background	N	N	92	N	N	25.3
DC61	St Agnells Lane, HH	Roadside	N	N	100	N	N	30.6
DC62	New Road, Northchurch	Roadside	TBD	N	100	N	N	46.2
DC63	Darrs Lane, Northchurch	Roadside	TBD	N	100	N	N	30.0
DC64	Lawn Lane 2, HH	Roadside	TBD	N	100	N	N	39.3
DC65	Lawn Lane 3, HH	Roadside	TBD	N	100	N	N	57.2
DC66	London Road, Apsley	Roadside	TBD	N	100	N	N	59.2
DC67	Allandale	Roadside	N	N	100	N	N	28.1
DC68	Belswains Sappi	Roadside	N	N	100	N	N	38.2
DC69	Lawn Lane Belswains	Roadside	IV	N	92	N	N	22.8
DC70	Lawn Lane 4, HH	Roadside	IV	N	100	N	N	39.9
DC71	Orchard Street	Kerbside	IV	N	100	N	N	28.6
DC72	London Featherbed	Roadside	IV	N	83	N	N	35.8
DC73	Durrants Hill Road	Roadside	TBD	N	100	N	N	33.4
DC74	Avia Close	Roadside	TBD	N	92	N	N	42.1
DC75	The Meads	Roadside	N	N	100	N	N	27.1
DC76	The Cotterells	Kerbside	N	N	100	N	N	36.0
DC77	Cotterells 1	Roadside	N	N	67	Y	N	27.6
DC78	Cotterells 2	Roadside	N	N	67	Y	N	30.0
DC79	Cotterells 3	Roadside	N	N	67	Y	N	29.8
DC80	Sappi 1	Roadside	N	N	42	Y	N	37.2
DC81	Sappi 2	Roadside	N	N	50	Y	N	52.3
DC82	Sappi 3	Roadside	N	N	67	Y	N	36.6
DC83	Briar Way	Background	N	N	58	Y	N	13.7
DC84	AQ Machine	Kerbside	TBD	N	58	Y	N	29.9
DC85	Health Centre, London Road	Kerbside	TBD	N	33	Y	N	33.0

Note:

TBD Within (to be declared) AQMAs

IV Within immediate vicinity of (to be declared) AQMA boundaries

Diffusion Tube Monitoring Data (2007 to 2011)

Table 2.4 below presents annual mean NO₂ concentrations for each diffusion tube site between 2007 and 2011. Exceedances of the annual mean air quality objective for NO₂ are highlighted in red. The annualisation and bias adjustment procedures/calculations for these previously reported data are detailed in the 2009 Updating and Screening Assessment, 2010 Progress Report and the 2011 Progress Report.

Summary of 2007 Diffusion Tube Monitoring Results

The annual mean air quality objective for NO₂ was exceeded at eight of the 22 monitoring locations within the borough in 2007. Six of the eight locations: High Street Northchurch (DC50), New Road, Northchurch (DC62), Lawn Lane 1 Hemel Hempstead (DC57), Lawn Lane 2 Hemel Hempstead (DC64), Lawn Lane 3 Hemel Hempstead (DC65) and London Road, Apsley (DC66) were located within the potential AQMAs identified in the 2007 Detailed Assessment.

The annual mean NO₂ objective was also exceeded at High Street Berkhamsted (DC47) and Watford Road, Kings Langley (DC54). However, as identified in **Table 2.1**, no relevant exposure is apparent at these two sites. Following the guidance/calculation methodology outlined in Box 2.3 of LAQM.TG(09), the annual mean NO₂ concentration at the nearest receptor/site of relevant exposure to the DC47 monitoring site was estimated to be 27µg/m³, and therefore below the relevant air quality objective. The annual mean NO₂ concentration at the nearest receptor/site of relevant exposure to the DC54 monitoring site was not specified.

Annual mean NO₂ concentrations exceeded 60µg/m³ at Lawn Lane 3 Hemel Hempstead (DC65) and London Road Apsley (DC66) in 2007. However these were considered as relatively minor exceedances (61.3µg/m³ and 60.3µg/m³ respectively) and therefore well within the typical diffusion tube measurement uncertainty of 25 per cent referenced in Section A1.40 of LAQM.TG(09). Annual mean NO₂ concentrations at all other monitoring sites were below 60µg/m³ in 2007.

Summary of 2008 Diffusion Tube Monitoring Results

The annual mean air quality objective for NO₂ was exceeded at five of the 22 monitoring locations within the borough in 2008. Four of the five locations; High Street Northchurch (DC50), Lawn Lane 1 Hemel Hempstead (DC57), Lawn Lane 3 (DC65) and London Road, Apsley (DC66) were situated within the areas previously identified in the 2007 Detailed Assessment as requiring declaration of air quality management areas (AQMAs) for the NO₂ annual mean objective.

The annual mean NO₂ objective was also exceeded at Watford Road, Kings Langley (DC54). However, this monitoring site is not representative of public exposure. Following the guidance/calculation methodology outlined in Box 2.3 of LAQM.TG(09), the annual average NO₂ concentration at the nearest receptor was estimated to be approximately 32µg/m³, and therefore below the relevant air quality objective.

Annual mean NO₂ concentrations at all 22 diffusion tube measurement locations were below 60µg/m³ in 2008.

Summary of 2009 Diffusion Tube Monitoring Results

The annual mean air quality objective for NO₂ was exceeded at six of the 21 monitoring locations within the borough in 2009. Five of the six locations; High Street Northchurch (DC50), New Road, Northchurch (DC62), Lawn Lane 1 Hemel Hempstead (DC57), Lawn Lane 3 (DC65) and London Road, Apsley (DC66) were situated within the (to be declared) AQMAs.

The annual mean NO₂ objective was also exceeded at Watford Road, Kings Langley (DC54). However, this monitoring site is not representative of public exposure. Following the guidance/calculation methodology outlined in Box 2.3 of LAQM.TG(09), the annual average NO₂ concentration at the nearest receptor was estimated to be approximately 30µg/m³, and therefore below the relevant air quality objective.

No exceedance of the annual mean air quality objective for NO₂ was observed at the other diffusion tube monitoring locations in 2009. An annual mean NO₂ concentration of 40µg/m³ was recorded at Lawn Lane 2, Hemel Hempstead (DC64) and at High Street Berkhamsted (DC47). However, as identified in Table 2.1, there is no relevant exposure at the High Street Berkhamsted (DC47) monitoring site, and the Lawn Lane 2 Hemel Hempstead (DC64) monitoring site is located within the (to be declared) Lawn Lane AQMA.

The annual mean NO₂ concentration at Lawn Lane 1, Hemel Hempstead (DC57) in 2009 was 60µg/m³. However, this was considered to be a minor exceedance of the 'guideline value' and therefore well within the typical diffusion tube measurement uncertainty of 25 per cent referenced in Section A1.40 of LAQM.TG(09). Annual mean NO₂ concentrations at all other monitoring sites were below 60µg/m³ in 2009.

Summary of 2010 Diffusion Tube Monitoring Results

The annual mean air quality objective for NO₂ was exceeded at seven of the 22 monitoring locations within the borough in 2010. Five of the seven locations; High Street Northchurch (DC50), New Road, Northchurch (DC62), Lawn Lane 1 Hemel Hempstead (DC57), Lawn Lane 3 (DC65) and London Road, Apsley (DC66) were situated within the (to be declared) AQMAs.

The annual mean NO₂ objective was also exceeded at High Street Berkhamsted (DC47) and Watford Road, Kings Langley (DC54). However, as identified in Table 2.1, no relevant exposure is apparent at these two sites. Following the guidance/calculation methodology outlined in Box 2.3 of LAQM.TG(09), annual average NO₂ concentrations at the nearest receptors/sites of relevant exposure to the DC47 and DC54 monitoring sites are estimated to be 37µg/m³ and 38µg/m³ respectively, and therefore below the relevant air quality objective.

No exceedance of the annual mean air quality objective for NO₂ was observed at the other diffusion tube monitoring locations in 2010. An annual mean NO₂ concentration of 38µg/m³ (i.e. approaching the relevant air quality objective) was recorded at Lawn Lane 2, Hemel Hempstead (DC64). However, as identified in Table 2.1, this monitoring site is located within the (to be declared) Lawn Lane AQMA.

The annual mean NO₂ concentration at Lawn Lane 3, Hemel Hempstead (DC65) in 2010 was 62µg/m³. However, this was considered to be a marginal exceedance of the 'guideline value' and therefore well within the typical diffusion tube measurement uncertainty of 25 per cent referenced in Section A1.40 of LAQM.TG(09). Annual mean NO₂ concentrations at all other monitoring sites were below 60µg/m³ in 2010.

Table 2.4 Results of Nitrogen Dioxide Diffusion Tubes (2007 to 2011)

Site ID	Site Type	Within AQMA?	Annual mean concentration (adjusted for bias) $\mu\text{g}/\text{m}^3$				
			2007 (Bias Adjustment Factor = 0.82)	2008 (Bias Adjustment Factor = 0.79)	2009* (Bias Adjustment Factor = 0.82)	2010* (Bias Adjustment Factor = 0.85)	2011 (Bias Adjustment Factor = 0.84)
DC40	Background	N	25.0	18.7 (21.9)	No data	24	24.2
DC42	Background	N	26.5	26.1	27	28	24.7
DC43	Background	N	22.1* (21.2)	20.7* (19.1)	20	21	18.5
DC46	Kerbside	N	32.8* (24.5)	23.7	24	25	22.4
DC47	Roadside	N	40.2	38.9	40	43	39.2
DC48	Background	N	22.6	18.9* (18.8)	21	23	20.8
DC50	Roadside	TBD	45.9	39.7 (41.6)	42	45	35.8
DC51	Kerbside	N	31.7* (30.7)	28.7	29	31	27.4
DC52	Roadside	N	36.4* (33.6)	33.8* (34.2)	32	36	33.6
DC53	Background	N	21.3* (20.3)	16.1	18	17	15.7
DC54	Roadside	N	49.3	48.5	48	52	46.7
DC55	Roadside	N	34.6	30.9* (31.7)	32	36	34.0
DC57	Roadside	TBD	58.2	56.4	60	59	53.2
DC58	Background	N	30.1	30.4	29	31	28.6
DC59	Background	N	33.3	30.3	34	35	35.2
DC60	Background	N	28.1	25.3	25	25	25.3
DC61	Roadside	N	31.6	31.6	30	29	30.6
DC62	Roadside	TBD	40.7	38.3	42	42	46.2
DC63	Roadside	TBD	30.3	28.6	33	33	30.0
DC64	Roadside	TBD	40.1	37.5	40	38	39.3
DC65	Roadside	TBD	61.3	54.4	56	62	57.2
DC66	Roadside	TBD	60.3	56.3	57	54	59.2
DC67	Roadside	N					28.1
DC68	Roadside	N					38.2
DC69	Roadside	IV					22.8
DC70	Roadside	IV					39.9
DC71	Kerbside	IV					28.6
DC72	Roadside	IV					35.8
DC73	Roadside	TBD					33.4
DC74	Roadside	TBD					42.1
DC75	Roadside	N					27.1
DC76	Kerbside	N					36.0
DC77	Roadside	N					27.6
DC78	Roadside	N					30.0
DC79	Roadside	N					29.8
DC80	Roadside	N					37.2
DC81	Roadside	N					52.3
DC82	Roadside	N					36.6
DC83	Background	N					13.7
DC84	Kerbside	TBD					29.9
DC85	Kerbside	TBD					33.0

Note:

TBD Within (to be declared) AQMAs

IV Within immediate vicinity of (to be declared) AQMA boundaries

* Less than 90% data capture; values in parenthesis are concentrations annualised (due to data capture being below 90%) following guidance provided in Box 3.2 of LAQM.TG(09).

All results for 2009 and 2010 were annualised due to low data capture (less than 90%).

2011 data annualised where data capture less than 75 %.

Potential Trends in Diffusion Tube Monitoring Results 2007 to 2011

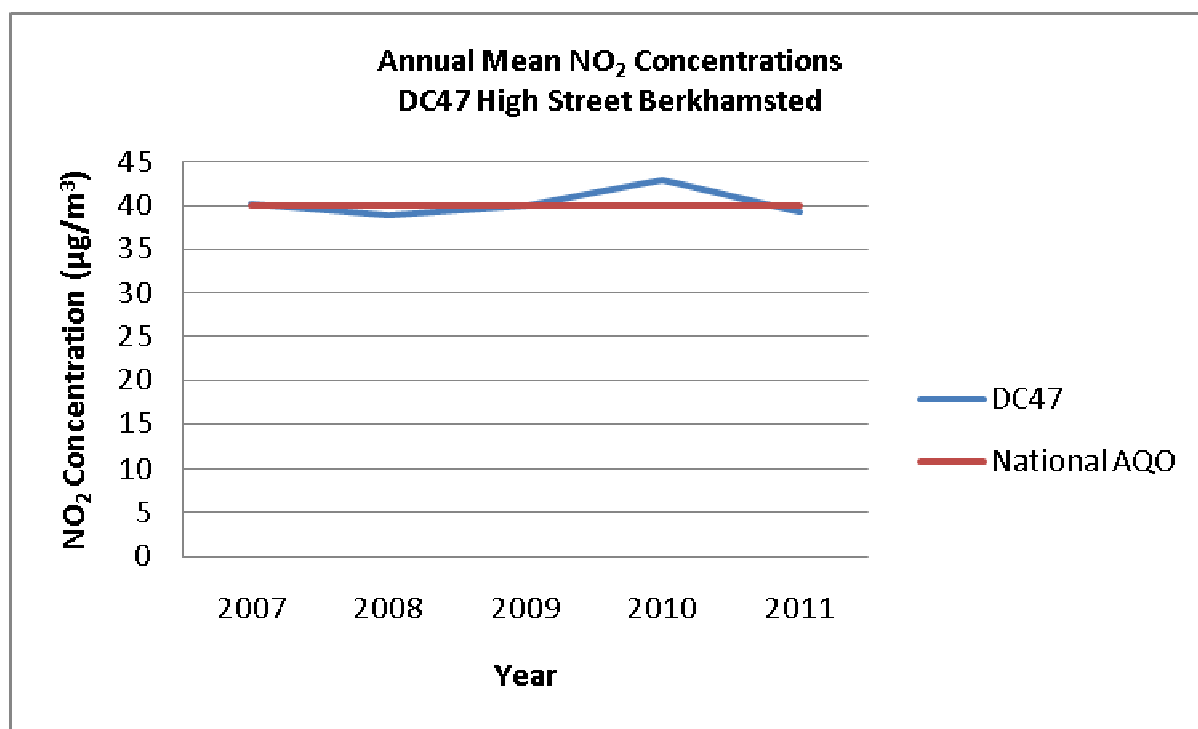
Of the diffusion tube monitoring locations exhibiting exceedances of the annual mean air quality objective for NO₂ between 2007 and 2011, the following fluctuations and potential trends have been identified over this 5-year period.

DC47 High Street, Berkhamsted

As illustrated by **Figure 2.1** below, the annual mean air quality objective for NO₂ was exceeded at High Street, Berkhamsted (DC47) twice over the 5-year period; this occurred in 2007 and 2010 with concentrations of 40.2µg/m³ and 43µg/m³ respectively. The highest annual mean NO₂ concentration was recorded in 2010 (43µg/m³) and the lowest annual mean NO₂ concentration in 2008 (38.9µg/m³).

No relevant exposure is apparent at this site.

Figure 2.1: Annual Mean NO₂ Concentrations for High Street, Berkhamsted

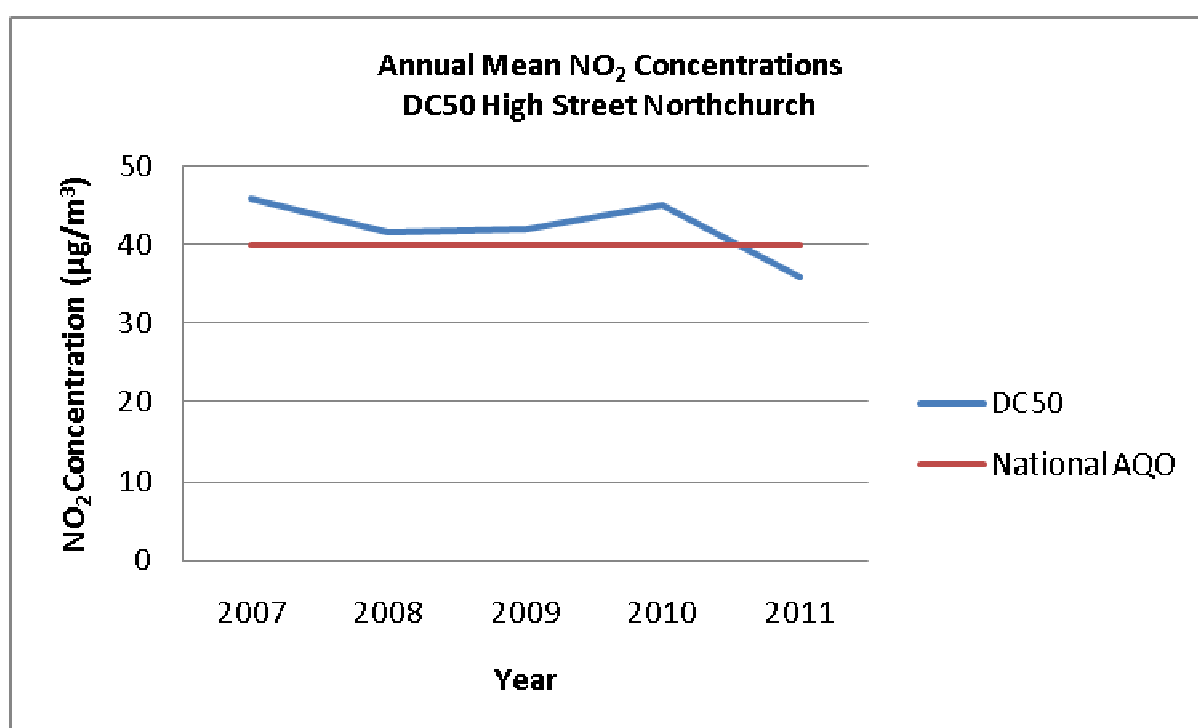


DC50 High Street, Northchurch

As illustrated by **Figure 2.2** below, the annual mean air quality objective for NO₂ was exceeded at High Street, Northchurch (DC50) four times over the 5-year period, in 2007, 2008, 2009 and 2010 with concentrations of 45.9µg/m³, 41.6µg/m³, 42µg/m³ and 45µg/m³ respectively. The highest annual mean NO₂ concentration was recorded in 2007 (45.9µg/m³) and the lowest annual mean NO₂ concentration in 2011 (35.8µg/m³).

This site is located within the (to be declared) High Street, Northchurch AQMA.

Figure 2.2: Annual Mean NO₂ Concentrations for High Street, Northchurch

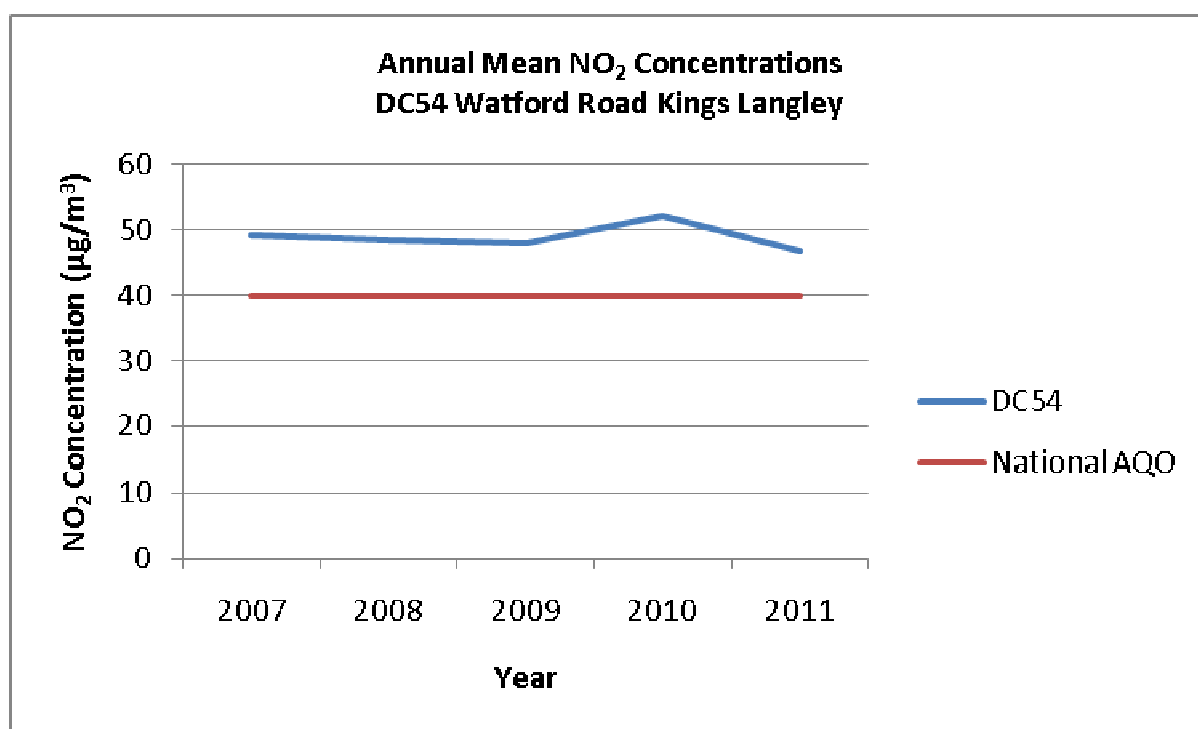


DC54 Watford Road, Kings Langley

As illustrated by **Figure 2.3** below, the annual mean air quality objective for NO₂ was consistently exceeded at Watford Road, Kings Langley (DC54) over the 5-year period 2007 to 2011 with concentrations of 49.3µg/m³, 48.5µg/m³, 48µg/m³, 52µg/m³ and 46.7µg/m³ respectively. The highest annual mean NO₂ concentration was recorded in 2010 (52µg/m³) and the lowest annual mean NO₂ concentration in 2011 (46.7µg/m³).

No relevant exposure is apparent at this site.

Figure 2.3: Annual Mean NO₂ Concentrations for Watford Road, Kings Langley

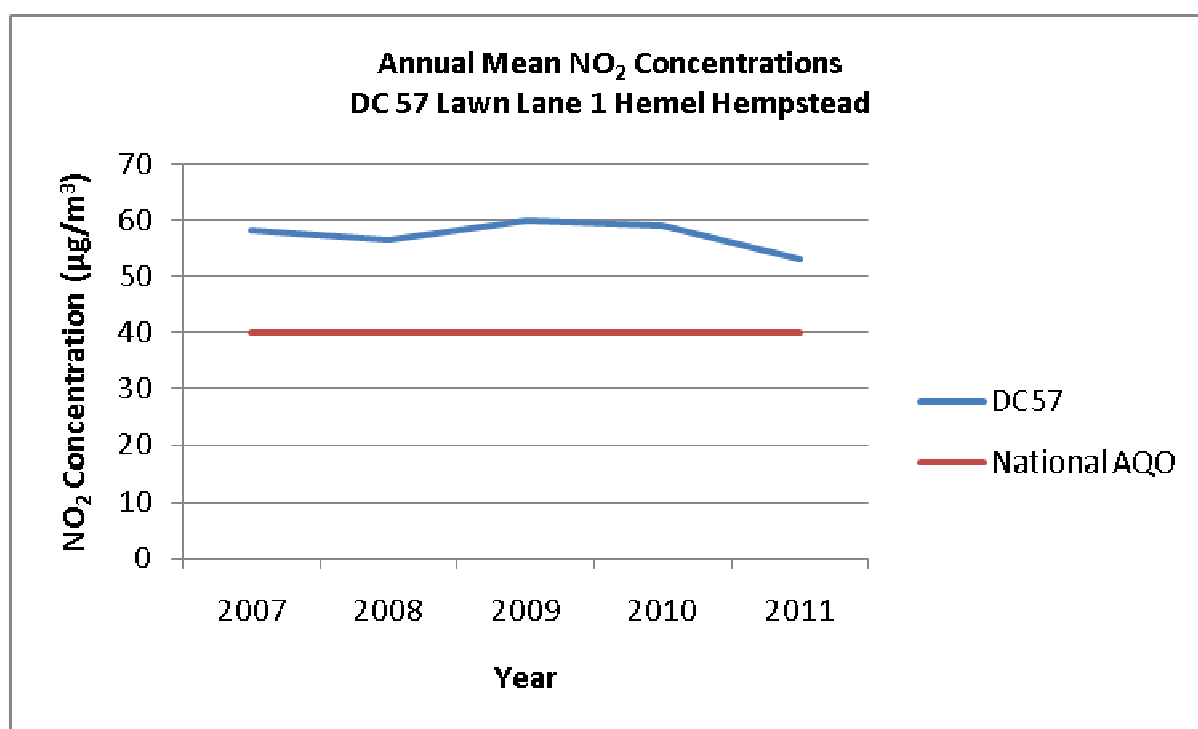


DC57 Lawn Lane 1, Hemel Hempstead

As illustrated in **Figure 2.4** below, the annual mean air quality objective for NO₂ was consistently exceeded at Lawn Lane 1, Hemel Hempstead (DC57) over the 5-year period 2007 to 2011 with concentrations of 58.2µg/m³, 56.4µg/m³, 60µg/m³, 59µg/m³ and 53.2µg/m³ respectively. The highest annual mean NO₂ concentration was recorded in 2009 (60µg/m³) and the lowest annual mean NO₂ concentration in 2011 (53.2µg/m³).

This site is located within the (to be declared) Lawn Lane, Hemel Hempstead AQMA.

Figure 2.4: Annual Mean NO₂ Concentrations for Lawn Lane 1, Hemel Hempstead

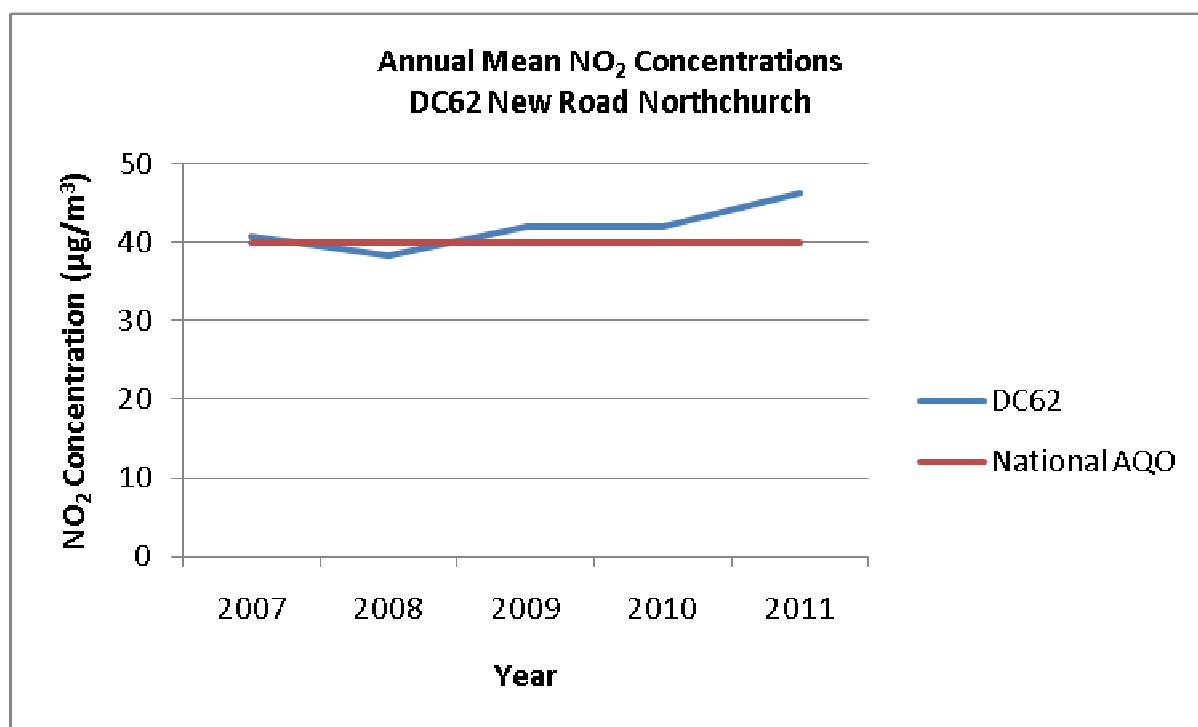


DC62 New Road, Northchurch

As illustrated in **Figure 2.5** below, the annual mean air quality objective for NO₂ was exceeded at New Road, Northchurch (DC62) four times over the 5-year period, in 2007, 2009, 2010 and 2011 with concentrations of 40.7µg/m³, 42µg/m³, 42µg/m³ and 46.2µg/m³ respectively. The highest annual mean NO₂ concentration was recorded in 2011 (46.2µg/m³) and the lowest annual mean NO₂ concentration in 2008 (38.3µg/m³).

This site is located within the (to be declared) High Street, Northchurch AQMA.

Figure 2.5: Annual Mean NO₂ Concentrations for New Road, Northchurch

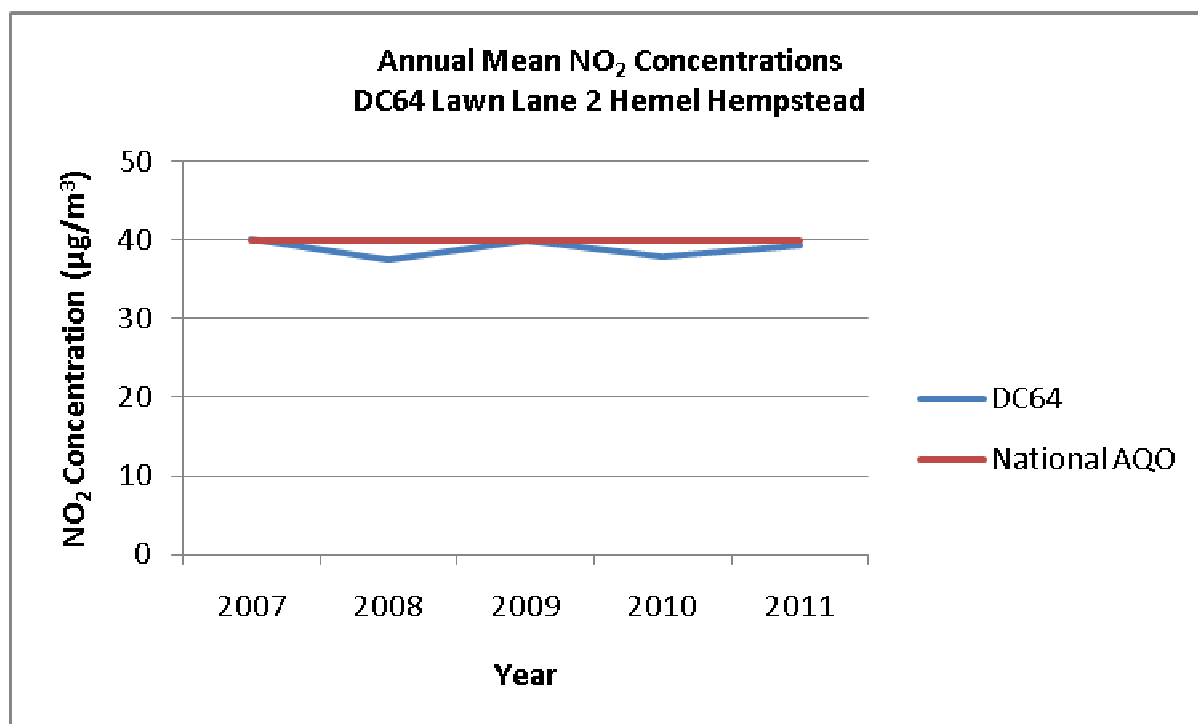


DC64 Lawn Lane 2, Hemel Hempstead

As illustrated by **Figure 2.6** below, the annual mean air quality objective for NO₂ was marginally exceeded at Lawn Lane 2, Hemel Hempstead once over the 5-year period. This occurred in 2007 with a concentration of 40.1µg/m³. The lowest annual mean NO₂ concentration was recorded in 2008 (37.5µg/m³).

This site is located within the (to be declared) Lawn Lane, Hemel Hempstead AQMA.

Figure 2.6: Annual Mean NO₂ Concentrations for Lawn Lane 2, Hemel Hempstead

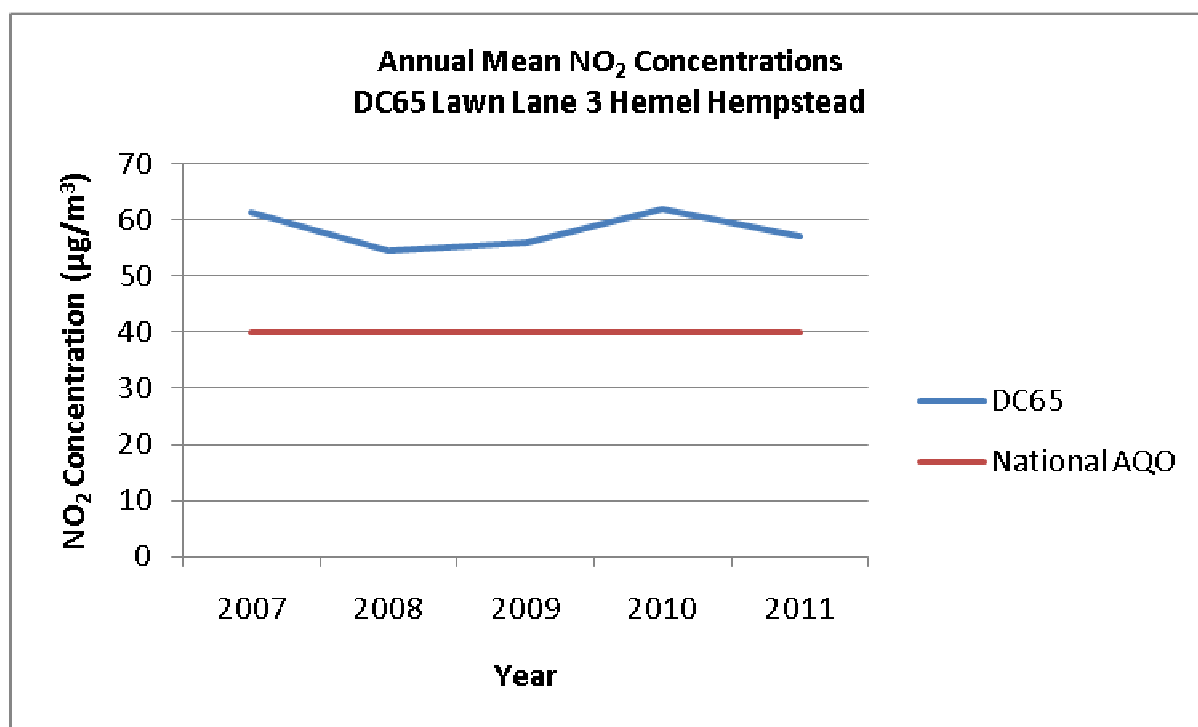


DC65 Lawn Lane 3, Hemel Hempstead

As illustrated in **Figure 2.7** below, the annual mean air quality objective for NO₂ was consistently exceeded at Lawn Lane 3, Hemel Hempstead (DC65) over the 5-year period 2007 to 2011, with concentrations of 61.3µg/m³, 54.4µg/m³, 56µg/m³, 62µg/m³ and 57.2µg/m³ respectively. The highest annual mean NO₂ concentration was recorded in 2010 (62µg/m³) and the lowest annual mean NO₂ concentration in 2008 (54.4µg/m³).

This site is located within the (to be declared) Lawn Lane, Hemel Hempstead AQMA.

Figure 2.7: Annual Mean NO₂ Concentrations for Lawn Lane 3, Hemel Hempstead

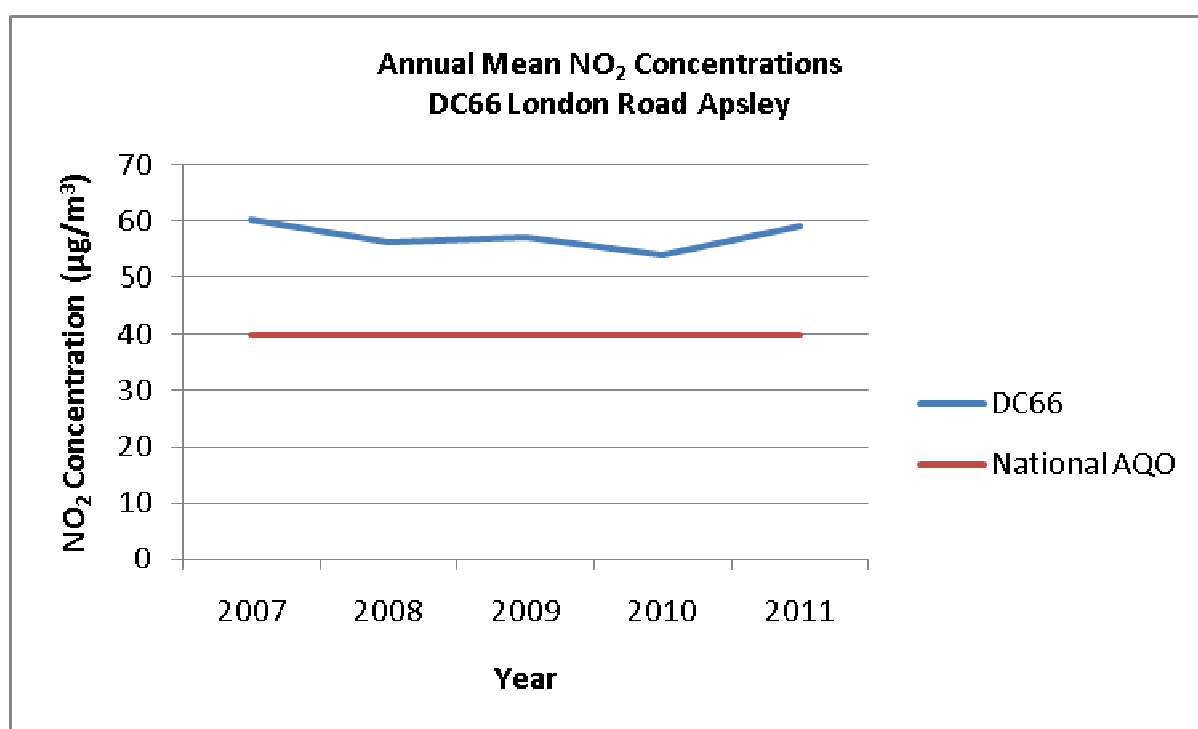


DC66 London Road, Apsley

As illustrated in **Figure 2.8** below, the annual mean air quality objective for NO₂ was consistently exceeded at London Road, Apsley (DC66) over the 5-year period 2007 to 2011, with concentrations of 60.3µg/m³, 56.3µg/m³, 57µg/m³, 54µg/m³ and 59.2µg/m³ respectively. The highest annual mean NO₂ concentration was recorded in 2007 (60.3µg/m³) and the lowest annual mean NO₂ concentration in 2010 (54µg/m³).

This site is located within the (to be declared) London Road, Apsley AQMA.

Figure 2.8: Annual Mean NO₂ Concentrations for London Road, Apsley



Summary

The annual mean NO₂ concentrations at all the eight monitoring locations above, exhibited a decrease from 2007 to 2008.

The annual mean NO₂ concentrations at seven of the eight monitoring locations above, exhibited an increase from 2008 to 2009. A decrease of 0.5µg/m³ was noted at Watford Road Kings Langley (DC54).

The annual mean NO₂ concentrations at four of the eight monitoring locations above, exhibited an increase from 2009 to 2010 (DC47, DC50, DC54 and DC65). The annual mean NO₂ concentrations at three of the remaining four monitoring locations above exhibited a decrease from 2009 to 2010 (DC57, DC64 and DC66). The remaining monitoring location; New Road, Northchurch (DC62) remained the same from 2009 to 2010.

The annual mean NO₂ concentrations at five of the eight monitoring locations above, exhibited a decrease from 2010 to 2011 (DC47, DC50, DC54, DC57 and DC65). The annual mean NO₂ concentrations at the three remaining monitoring locations above exhibited an increase from 2010 to 2011 (DC62, DC64 and DC66).

The annual mean NO₂ objective was exceeded at the Avia Close (DC74) and also Sappi 1 (DC81) monitoring locations in 2011. However as these sites were only commissioned in December 2010 and May 2011 respectively, there are no trends to report at this time.

2.2.2 PM₁₀

Dacorum Borough Council does not currently carry out monitoring of PM₁₀.

2.2.3 Sulphur Dioxide

Dacorum Borough Council does not currently carry out monitoring of Sulphur Dioxide.

2.2.4 Benzene

Dacorum Borough Council does not currently carry out monitoring of Benzene.

2.2.5 Other pollutants monitored

Dacorum Borough Council does not currently carry out routine monitoring of any other pollutants.

2.2.6 Summary of Compliance with AQS Objectives

Dacorum Borough Council has examined the results from monitoring in the borough. Concentrations outside of the (to be declared) AQMAs are all below the objectives at relevant locations, therefore there is no need to proceed to a Detailed Assessment.

3 Road Traffic Sources

3.1 Narrow Congested Streets with Residential Properties Close to the Kerb

There are no new / newly identified narrow and congested streets that meet the relevant assessment criteria identified in LAQM.TG (09). There is therefore no need to proceed to a detailed assessment for NO₂.

Dacorum Borough Council confirms that there are no new/newly identified congested streets with a flow above 5,000 vehicles per day and residential properties close to the kerb, that have not been adequately considered in previous rounds of Review and Assessment.

3.2 Busy Streets Where People May Spend 1-hour or More Close to Traffic

There are no busy streets within the borough that are new or were not considered in earlier rounds of review and assessment. There is therefore no need to proceed to a detailed assessment for NO₂.

Dacorum Borough Council confirms that there are no new/newly identified busy streets where people may spend 1 hour or more close to traffic.

3.3 Roads with a High Flow of Buses and/or HGVs.

There are no roads within the borough with an unusually high proportion of HDVs that are new or were not considered in earlier rounds of review and assessment. There is therefore no need to proceed to a detailed assessment for PM₁₀ or NO₂.

Dacorum Borough Council confirms that there are no new/newly identified roads with high flows of buses/HDVs.

3.4 Junctions

There are no busy junctions within the borough that are new or were not considered in earlier rounds of review and assessment. There is therefore no need to proceed to detailed assessment for PM₁₀ or NO₂.

Dacorum Borough Council confirms that there are no new/newly identified busy junctions/busy roads.

3.5 New Roads Constructed or Proposed Since the Last Round of Review and Assessment

There are no new or proposed roads within the borough. There is therefore no need to proceed to a detailed assessment for PM₁₀ or NO₂.

Dacorum Borough Council confirms that there are no new/proposed roads.

3.6 Roads with Significantly Changed Traffic Flows

There are no new / newly identified roads within the borough with significantly changed traffic flows. There is therefore no need to proceed to detailed assessment for PM₁₀ or NO₂.

Dacorum Borough Council confirms that there are no new/newly identified roads with significantly changed traffic flows.

3.7 Bus and Coach Stations

There are no relevant bus stations that were not considered in previous rounds of review and assessment. There is therefore no need to proceed to a detailed assessment for PM₁₀ or NO₂.

Dacorum Borough Council confirms that there are no relevant bus stations in the Local Authority area.

4 Other Transport Sources

4.1 Airports

There are no airports within the local authority area. The nearest airport is located in Luton, approximately 10km from the northern boundary of the borough. There is therefore no need to proceed to a detailed assessment for NO₂.

Dacorum Borough Council confirms that there are no airports in the Local Authority area.

4.2 Railways (Diesel and Steam Trains)

As highlighted in section 1.1, a major railway runs through the borough, linking London Euston to the south with the midlands to the north. Although diesel locomotives occasionally utilise the railway, the vast majority of trains are electrically powered. The few diesel trains that do travel through the borough do not stop for more than 15 minutes at any location. None of the trains operating on the network are powered by steam.

There are, therefore, no diesel or coal-fired stationary locomotives within the local authority area that could contribute towards an exceedance of relevant air quality objectives for sulphur dioxide. Similarly, there aren't large numbers of moving diesel locomotives within the local authority area that could contribute towards an exceedance of relevant air quality objectives for NO₂. There is therefore no need to proceed to a detailed assessment for SO₂ or NO₂.

4.2.1 Stationary Trains

Dacorum Borough Council confirms that there are no locations where diesel or steam trains are regularly stationary for periods of 15 minutes or more, with potential for relevant exposure within 15m.

4.2.2 Moving Trains

Dacorum Borough Council confirms that there are no locations with a large number of movements of diesel locomotives, and potential long-term relevant exposure within 30m.

4.3 Ports (Shipping)

There are no ports or local sources of shipping within the local authority area. There is therefore no need to proceed to a detailed assessment for SO₂.

Dacorum Borough Council confirms that there are no ports or shipping that meet the specified criteria within the Local Authority area.

5 Industrial Sources

5.1 Industrial Installations

5.1.1 New or Proposed Installations for which an Air Quality Assessment has been Carried Out

Table 5.1 lists new Part B Installations permitted within the borough since the 2009 Updating and Screening Assessment. No new Part A(1) or A(2) Installations have been permitted within the borough since the 2009 Updating and Screening Assessment. Dacorum Borough Council is unaware of any new or proposed industrial installations in neighbouring authorities near to the borough boundary for which planning approval has been granted.

Appendix A contains a list of all current permitted Part A(1), A(2) and B Installations within Dacorum borough in 2011.

Table 5.1 New Part B Installations permitted within Dacorum borough since 2009

Permit Ref	Process	Operator	Address	Date of issue
SR 262976	Dry Cleaner	Unicorn Dry Cleaners	104 London Road, Hemel Hempstead, Hertfordshire, HP3 9SD	13 July 2009
SR 243550	Vehicle Re-finisher	5 star Accident Repair Centre Ltd	Paradise Industrial Estate, Wood Lane, Hemel Hempstead, Hertfordshire, HP2 4TP	11 August 2009
DBC/EP/46	Small Waste Oil Burner <0.4MW	Mechanix Direct Ltd	Unit 16 Apsley Industrial Estate, Kents Avenue, Hemel Hempstead, Hertfordshire, HP3 9XH	21 March 2012
DBC/EP/47	Dry Cleaner	Autocoin Laundrette and Dry Cleaners	331 High Street , Berkhamsted, Hertfordshire, HP4 1AL	Application currently being processed

Dacorum Borough Council has assessed new/proposed industrial installations, and concluded that it will not be necessary to proceed to a Detailed Assessment.

5.1.2 Existing Installations where Emissions have Increased Substantially or New Relevant Exposure has been Introduced

There are no existing industrial installations within the borough of Dacorum or nearby in a neighbouring authority where emissions have increased substantially or where new relevant exposure has been introduced.

Dacorum Borough Council confirms that there are no industrial installations with substantially increased emissions or new relevant exposure in their vicinity within its area or nearby in a neighbouring authority.

5.1.3 New or Significantly Changed Installations with No Previous Air Quality Assessment

There are no new or significantly changed industrial installations within the borough of Dacorum or nearby in a neighbouring authority.

Dacorum Borough Council confirms that there are no new or proposed industrial installations for which planning approval has been granted within its area or nearby in a neighbouring authority.

5.2 Major Fuel (Petrol) Storage Depots

The Buncefield Oil Storage Depot site is located approximately 2km north east of Hemel Hempstead town centre off Green Lane. The site is operated by a number of different companies including Hertfordshire Oil Storage Ltd (HOSL), British Petroleum (BP) and West London Pipeline and Storage Ltd (WLPS). The WLPS facility is operated by the British Pipeline Agency (BPA). BPA intend to re-instate their operational facilities following the incident in December 2005, which occurred on the HOSL West site, resulting in destruction of the HOSL East site, the WLPS site and damage to other surrounding oil storage facilities and properties. The BP Oil (UK) Ltd site was closed for approximately 3 years as a result of damage incurred during the explosion. This site has been fully operational since 2009.

The WLPS site comprises two sections, bisected by Cherry Trees Lane, Site A (2.1ha), to the south, and Site B (3.1ha), to the north. Site A is situated within the borough of Dacorum and Site B within the district of St Albans City and District Council. A full planning application

was submitted to St Albans City and District Council (application reference: 5/09/0906) and Dacorum Borough Council (application reference: 4/00893/09/MFA) in May 2009 for the redevelopment of the WLPS site on a like-for-like basis (for the storage and distribution of Jet A1 aviation kerosene). Conditional planning permission was granted by St Albans City and District Council in December 2009 and Dacorum Borough Council in February 2011. Construction works are scheduled to commence on-site in summer 2012.

An Environmental Statement was submitted accompanying the planning application. This considered the potential impacts on air quality during the key phases of the proposed rebuild:

- Construction dust and other fugitive emissions during the construction phase; and
- Emissions of Jet A1 Aviation Kerosene vapours via storage tank vents during operation

Following assessment, it was concluded that with an Environmental Management Plan in place, any impact on air quality during construction would be negligible. In terms of any operational impact on air quality, adverse effects due to operational emissions would also be negligible. Furthermore, diffusion tube measurements of benzene carried out by St Albans City and District Council between August 2004 and January 2005 indicated a monthly maximum concentration of $1.2\mu\text{g}/\text{m}^3$, suggesting that annual mean concentrations of benzene are likely to have been below the $5\mu\text{g}/\text{m}^3$ objective. The proposed tanks are the same type and quantity as those on the BPA site during this monitoring period, it is expected that, as before, the resulting benzene emission will have no significant air quality impact.

Employing the nomogram outlined in Figure 5.16 of LAQM.TG(09), taking into account the location of the nearest residential receptor to the petrol storage site and annual benzene emissions data provided by the National Atmospheric Emissions Inventory for 2010 (the most recent data set available for the petrol storage site in question), it is determined that it is not necessary to proceed to a detailed assessment for benzene for this source.

Dacorum Borough Council has assessed a major petrol storage depot, and concluded that it will not be necessary to proceed to a Detailed Assessment.

5.3 Petrol Stations

No new petrol stations have opened in Dacorum borough since the 2009 Updating and Screening Assessment. All petrol stations assessed in 2009 met the criteria outlined in LAQM.TG(09). There is therefore no need to proceed to a detailed assessment for benzene.

Petrol stations permitted by Dacorum Borough Council under the Environmental Permitting Regulations 2010 are listed in Appendix A.

Dacorum Borough Council confirms that there are no petrol stations meeting the specified criteria.

5.4 Poultry Farms

A review of the Environment Agency's IPPC public register (as directed in the technical guidance) indicates that there are currently no poultry farms regulated by the Environment Agency within the local authority area. This was also confirmed by the local (Thames North East) Environment Agency office. It is assumed, therefore, that there are no poultry farms within Dacorum borough that meet the significance criteria outlined in the technical guidance.

In light of this it is considered that there is no need to proceed to a detailed assessment of PM₁₀ emission from poultry farms.

Dacorum Borough Council confirms that there are no poultry farms meeting the specified criteria.

6 Commercial and Domestic Sources

6.1 Biomass Combustion – Individual Installations

There are no 50 kW to 20 MW biomass combustion units within the borough that are regulated under the Clean Air Act. The 2009 Updating and Screening Assessment for sulphur dioxide indicated that there was no significant domestic burning of coal or oil in boilers >5 MW within the borough. This continues to be the case, indicating that there are no significant individual combustion sources resulting in emissions of PM₁₀ and nitrogen oxides. There is therefore no need to proceed to a detailed assessment for PM₁₀ or NO₂.

Dacorum Borough Council confirms that there are no biomass combustion plant in the Local Authority area.

6.2 Biomass Combustion – Combined Impacts

There are no areas within the borough where there is a high density of housing and service sector biomass combustion appliances which, when combined, could lead to unacceptably high PM₁₀ concentrations. There is therefore no need to proceed to a detailed assessment for NO₂.

Dacorum Borough Council confirms that there are no biomass combustion plant in the Local Authority area.

6.3 Domestic Solid-Fuel Burning

The 2009 Updating and Screening Assessment indicated that there were no areas of significant domestic coal burning within the borough. This continues to be the case, and there are currently no significant areas of domestic coal burning within the borough that could result in emissions of sulphur dioxide. There is therefore no need to proceed to a detailed assessment for SO₂.

Dacorum Borough Council confirms that there are no areas of significant domestic fuel use in the Local Authority area.

7 Fugitive or Uncontrolled Sources

The following new developments were identified in the 2010 and 2011 Progress Reports as potential sources of fugitive or uncontrolled dust emissions requiring consideration within this Updating and Screening Assessment:

- Buncefield Oil Storage Depot
- Waste Transfer Station, Maxted Close, Hemel Hempstead

As previously detailed in Section 5.2, planning permission has been granted for the redevelopment of the WLPS site at the Buncefield Oil Storage Depot. Construction works are scheduled to commence on-site in summer 2012. The Environmental Statement submitted accompanying the planning application considered the potential impacts on air quality of construction dust and other fugitive emissions during the construction phase. Following assessment, it was concluded that with an Environmental Management Plan in place, any impact on air quality during construction would be negligible.

The waste transfer station located at 82 Maxted Close, Hemel Hempstead identified by the 2010 and 2011 Progress Reports is operated by Holywell Haulage Ltd. This site is permitted and regulated by the Environment Agency as a waste operation under the Environmental Permitting Regulations 2010. (Permit reference: EP3097NY/A001). The environmental permit (waste management licence) issued contains various conditions, which must be complied with in order to prevent harm to the environment. One of the conditions prohibits the release of dust or other material from the site. If the site breaches the permit conditions, the Environment Agency has powers to take enforcement action against the site. Dacorum Borough Council is not aware of any enforcement action taken against the site, in relation to a breach of the permit condition relating to the release of dust. Additionally, a review of Dacorum Borough Council Environmental Health records indicates that no alleged nuisance complaints have been received to date in reference to dust emissions from operations at this site.

Since 2009, a number of complaints have been received from residents and businesses relating to dust generation associated with activities at the waste transfer site operated by J F Bishop & Son Ltd, located at Bishop House, Mark Road, Hemel Hempstead. This site is permitted and regulated by the Environment Agency as a waste operation under the Environmental Permitting Regulations 2010. (Permit reference: EAWML80606). As the release of dust from the site is prohibited under the permit, dust mitigation measures were imposed by the Environment Agency in 2010, including damping down and the erection of a

screen across the top of the boundary fence. Monitoring equipment has been installed at Marks Road by the Environment Agency, which is being used to monitor for PM₁₀, PM_{2.5} and NO_x. This equipment has been installed for a three month period to provide data to enable the Environment Agency to ensure that the waste operations at this site are not significantly contributing to failures of local air quality and that appropriate abatement technology is being used. The monitoring results will determine whether progression to detailed assessment for PM₁₀ will be necessary. The results will be reported in future LAQM reports.

Table 7.1 lists the new waste operations permitted by the Environmental Agency in Dacorum borough since the 2009 Updating and Screening Assessment. Dacorum Borough Council is not aware of any enforcement action taken against these permitted waste operations, in relation to a breach of permit conditions relating to the release of dust. Additionally, a review of Dacorum Borough Council Environmental Health records indicates that no alleged nuisance complaints have been received to date in reference to dust emissions associated with these operations.

Table 7.1 New waste operations licensed in Dacorum borough since 2009

Permit Ref	Process	Operator	Address	Date of issue
EPR/RP3397EG	Mobile plant for the treatment of waste soils and contaminated material, substances or products. (SR2008No27)	PMC Soil Solutions Ltd	The Coach House, 77A The Marlowes, Hemel Hempstead, Hertfordshire, HP1 1LF	13 January 2011
EPR/VP3892EF	Waste electrical and electronic equipment authorised treatment facility (ATF). (SR2008No23)	Maritrans Recycling (UK) Ltd	Unit 9, Hall Road, Maylands Wood Estate, Hemel Hempstead, Hertfordshire, HP2 7BH	16 May 2011

Following the steps outlined in Box 5.10 of LAQM.TG(09), it is not considered necessary to proceed to detailed assessment for PM₁₀ at the above locations at this stage. In relation to the J F Bishop & Sons site; once the monitoring results have been received, the need to progress to detailed assessment will be considered.

Planning permission has been granted for a large scale residential development comprising 325 dwellings, provision of open space, landscaping, footpath links and associated highway improvement works including new railway crossings (vehicular and pedestrian) on land adjacent to the Manor Estate, Apsley (4/02419/04/FUL). This site is located off London Road, Apsley, with access proposed via Featherbed Lane.

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Groundworks have recently commenced on site. Although no complaints have been received by Dacorum Borough Council Environmental Health to date relating to dust, due to the proximity of residential properties etc, these works could present a potential source of dust emissions.

Dacorum Borough Council has identified potential sources of fugitive particulate matter that meet specified criteria, and **will assess the need to proceed to a Detailed Assessment for PM₁₀ in the next LAQM report.**

Note: Text in box has been amended.

8 Conclusions and Proposed Actions

8.1 Conclusions from New Monitoring Data

The non automatic (diffusion tube) monitoring results for the 2011 calendar year, indicate that the annual mean NO₂ concentrations continue to exceed the relevant air quality objective in the three previously identified (to be declared) AQMAs (at Lawn Lane, Hemel Hempstead; London Road, Apsley and High street, Northchurch). Annual mean NO₂ concentrations greater than the relevant air quality objective were also observed at Watford Road, Kings Langley (DC54) and Sappi 2 (DC81). However, it has been determined that there is no relevant exposure at these two locations and therefore no requirement to proceed to a detailed assessment(s) for annual mean NO₂. No exceedances of the short-term 'indicator concentration' of 60µg/m³ was measured at any of the monitoring locations in 2011.

8.2 Conclusions from Assessment of Sources

Planning permission has been granted for a large scale residential development comprising 325 dwellings, provision of open space, landscaping, footpath links and associated highway improvement works including new railway crossings (vehicular and pedestrian) on land adjacent to the Manor Estate, Apsley (4/02419/04/FUL). This site is located off London Road, Apsley, with access proposed via Featherbed Lane. Groundworks have recently commenced on site. Although no complaints have been received by Dacorum Borough Council Environmental Health to date relating to dust, due to the proximity of residential properties etc, these works could present a potential source of dust emissions. Furthermore, as access to the new development is proposed via Featherbed Lane, which is located within the (to be declared) London Road, Apsley AQMA, it is likely that this development will result in increased vehicle movements within this area. The potential impact will be addressed during the Further Assessment.

The waste transfer site operated by J F Bishop & Son Ltd at Mark Road, Hemel Hempstead, presents a potential issue with regard to dust emissions, which will require further consideration in the next LAQM report.

8.3 Proposed Actions

The 2011 monitoring data has not identified the need to progress to a detailed assessment for any pollutants at any locations with Dacorum borough. However, it is recognised that the proposed AQMAs in relation to the annual mean air quality objective for NO₂ at Lawn Lane, Hemel Hempstead; London Road, Apsley and High Street, Northchurch must be declared without delay. Furthermore, it is proposed that the continuous NO_x/NO₂ analyser situated on High Street, Northchurch is commissioned during 2012, which will determine with more accuracy likely short-term (1-hour average) ambient NO₂ concentrations.

Following the AQMA declarations, a Further Assessment of each AQMA will be completed and an Action Plan(s) developed. Progress of the implementation of any future Action Plan(s) will therefore be detailed in subsequent LAQM review and assessment reports.

9 References

Air Quality Consultants Ltd (2007) Detailed Assessment of Air Quality in Dacorum

Dacorum Borough Council (2011) 2011 Air Quality Progress Report for Dacorum Borough Council

Dacorum Borough Council (2010). 2010 Air Quality Progress Report for Dacorum Borough Council

Dacorum Borough Council (2009). 2009 Air Quality Updating and Screening Assessment for Dacorum Borough Council

Dacorum Borough Council (2006). 2006 Air Quality Updating and Screening Assessment for Dacorum Borough Council

Dacorum Borough Council (2003). 2003 Air Quality Updating and Screening Assessment for Dacorum Borough Council

DEFRA (2009). Part IV of the Environment Act 1995 Environment (Northern Ireland) Order 2002 Part III Local Air Quality Management Technical Guidance LAQM.TG(09)

DEFRA UK Air Information Resource website: <http://uk-air.defra.gov.uk>

Hertfordshire and Bedfordshire Air Quality Network: www.hertsandbedsair.net

RSK Group (2009) Detailed Air Dispersion Modelling Assessment for PM₁₀ Road Traffic Emissions in Dacorum Borough.

Appendices

Appendix A: Part A(1), A(2) and B Installations permitted within Dacorum BC

Appendix B: NO₂ Diffusion Tube Data

Appendix A

Part A(1) Installations with Dacorum borough

Permit Ref	Process Type	Operator	Address	Grid Ref
CP3935XZ	Non-Ferrous Metals Production	Henkel Locite Adhesives Ltd	Wood Lane End, Hemel Hempstead, Hertfordshire, HP2 4RQ	TL 081 080

Part A(2) Installations permitted by Dacorum BC

Permit Ref	Process Type	Operator	Address	Grid Ref
SR 50602	Brickworks	Bovingdon Brickworks Ltd	Leyhill Road, Bovingdon, Hertfordshire, HP3 0NW	SP 987 010

Part B Installations permitted by Dacorum BC

Permit Ref	Process Type	Operator	Address	Grid Ref
MAU 8072	Storage, Unloading and Loading Petrol at Terminals	BP Oil UK Ltd	Buncefield Terminal, Green Lane, Hemel Hempstead, Hertfordshire, HP2 7JA	TL 088 084
MAU 8073	Storage, Unloading and Loading Petrol at Terminals	Hertfordshire Oil Storage Ltd	Buncefield Terminal, Green Lane, Hemel Hempstead, Hertfordshire, HP2 7HZ	TL 085 084
MAU 8630	Vehicle Re-spraying	Abbey Motors	24 Mark Road, Hemel Hempstead, Hertfordshire, HP2 7DN	TL 075 082
MAU 8699	Vehicle Re-spraying	Hangreen Ltd (T/A Sky Ford)	Redbourn Road, Hemel Hempstead, Hertfordshire, HP2 7AZ	TL 070 089
MAU 8700	Vehicle Re-spraying	Pillings Bodyshop	Rucklers Lane, Kings Langley, Hertfordshire, WD4 8AU	TL 067 042
SR 243550	Vehicle Re-spraying	5 Star Accident Repair Centre Ltd	Paradise Industrial Estate, Hemel Hempstead	TL 059 066
DBC/EP/04	Cement Works	Hanson Premix	Riversend Road, Hemel Hempstead, Hertfordshire, HP3 9QS	TL 053 055
SR 132058	Application and Curing of Powder Coating to Metal Parts	C G Versatile Fittings	City House, Swallowdale Lane, Hemel Hempstead, Hertfordshire, HP2 7EA	TL 074 089
SR 141767	Mobile Crushing Plant	Davis and Samson	Billet Lane, Berkhamsted, Hertfordshire, HP4 0DP	SP 981 084
SR 228117	Mobile Crushing Plant	Davis and Samson	Billet Lane, Berkhamsted, Hertfordshire, HP4 0DP	SP 981 084
MAU 7961	Mobile Crushing Plant	G J Gaywood	1 Alexandra Road, Kings Langley, Hertfordshire, WD4 8DU	TL 075 024
SR 135041	Mobile Crushing Plant	G J Gaywood	1 Alexandra Road, Kings Langley, Hertfordshire, WD4 8DU	TL 075 024
SR 178398	Mobile Crushing Plant	W F Button & Son Ltd (T/A Button-Lingard)	Button House, Pix Farm Lane, Hemel Hempstead, Hertfordshire, HP1 2RY	TL 019 066
SR 215103	Small Waste Oil Burner <0.4MW	Car Care Works (T/A Chiltern Aston Centre)	Leyhill Road, Bovingdon, Hertfordshire, HP3 0NW	TL 004 030
MAU 6647	Small Waste Oil Burner <0.4MW	Chipperfield Garden Machinery	Langley Road, Chipperfield, Hertfordshire, WD4 9EG	TL 043 019
DBC/EP/46	Small Waste Oil Burner <0.4MW	Mechanix Direct Ltd	Unit 16, Kents Avenue, Hemel Hempstead, Hertfordshire, HP3 9XH	

Part B Installations permitted by Dacorum BC (Dry Cleaners)

Permit Ref	Process Type	Operator	Address	Grid Ref
SR 159290	Dry Cleaners	B Smart Dry Cleaners	221 High Street, Berkhamsted, Hertfordshire, HP4 1AD	SP 990 078
SR 156845	Dry Cleaners	Bovingdon Dry Cleaners	33 High Street, Bovingdon, Hertfordshire, HP3 0HG	TL 013 038
SR 173664	Dry Cleaners	FM Express Dry Cleaners	321 High Street, Berkhamsted, Hertfordshire, HP4 1AL	SP 986 081
SR 159715	Dry Cleaners	Johnson Cleaners	C/O Sainsburys Store, Apsley Mills, Hemel Hempstead, Hertfordshire, HP3 9QZ	TL 061 053
SR 173113	Dry Cleaners	Johnson Cleaners	Front Shop, 384 High Street, Berkhamsted, Hertfordshire, HP4 1HU	SP 850 081
SR 174555	Dry Cleaners	Swift Dry Cleaners	136 The Marlowes, Hemel Hempstead, Hertfordshire, HP1 1EZ	TL 055 072
SR 168508	Dry Cleaners	Rainbow Dry Cleaners	26 Queens Square, Adeyfield, Hemel Hempstead, Hertfordshire, HP2 4ES	TL 069 075
SR 159422	Dry Cleaners	Swan Cleaners	8 Rossgate, Gadebridge, Hemel Hempstead, Hertfordshire, HP1 3LG	TL 043 084
SR 207970	Dry Cleaners	Pristine Dry Cleaners	22 Mark Road, Hemel Hempstead, Hertfordshire, HP2 7BN	TL 077 080
SR 262976	Dry Cleaners	Unicorn Dry Cleaners	104 London Road, Apsley, Hertfordshire, HP3 9SD	TL 056 055
TBC	Dry Cleaners	Auto Coin Laundrette and Dry Cleaners	High Street, Berkhamsted, Hertfordshire,	

Part B Installations permitted by Dacorum BC (Petrol Stations)

Permit Ref	Process Type	Operator	Address	Grid Ref
MAU 6018	Unloading of Petrol into Storage at Petrol Stations	Shell	Everest Way, Hemel Hempstead, Hertfordshire, HP2 4HZ	TL 070 075 GB
DBC/EP/10	Unloading of Petrol into Storage at Petrol Stations	MK Services	Bourne End Filling Station, London Road, Bourne End, Hertfordshire, HP1 2RQ	TL 026 062 GB
MAU 6016	Unloading of Petrol into Storage at Petrol Stations	Shell	Breakspear Way, Hemel Hempstead, Hertfordshire, HP2 4TZ	TL 085 075 GB
MAU 6017	Unloading of Petrol into Storage at Petrol Stations	BP	Breakspear Way, Hemel Hempstead, Hertfordshire, HP2 4TZ	TL 085 075 GB
DBC/EP/15	Unloading of Petrol into Storage at Petrol Stations	Rontec Watford Ltd	Total Convenience Store, Bourne End, A41 Service Area, Hertfordshire, HP1 2SB	TL 015 058 GB
DBC/EP/26	Unloading of Petrol into Storage at Petrol Stations	Rontec Watford Ltd	Cross Oaks Service Station, 345 High Street, Berkhamsted, Hertfordshire, HP4 1AL	SP 986 080 GB
DBC/EP/16	Unloading of Petrol into Storage at Petrol Stations	Rontec Watford Ltd	Tring Service Station, Brook Street, Tring, Hertfordshire, HP23 5EE	SP 926 116 GB
MAU 6021	Unloading of Petrol into Storage at Petrol Stations	Tesco Stores Ltd	Tesco Store Ltd, Jarman Way, Hemel Hempstead, Hertfordshire, HP2 4JS	TL 067 065 GB
MAU 5989	Unloading of Petrol into Storage at Petrol Stations	Esso	Hall Park Service Station, London Road, Berkhamsted. Hertfordshire, HP4 2NB	TL 000 075 GB
MAU 6015	Unloading of Petrol into Storage at Petrol Stations	Sainsburys Supermarket Ltd	London Road, Apsley Mills, Hemel Hempstead, Hertfordshire, HP3 9SP	TL 059 053 GB
MAU 6029	Unloading of Petrol into Storage at Petrol Stations	Shell	14 London Road, Hemel Hempstead, Hertfordshire, HP3 9SP	TL 0258 054 GB
MAU 6024	Unloading of Petrol into Storage at Petrol Stations	Pace Petroleum	London Road, Northchurch, Hertfordshire, HP23 5SR	SP 957 102 GB
MAU 6028	Unloading of Petrol into Storage at Petrol Stations	Flamstead Filling Station	London Road, Flamstead, Hertfordshire, AL3 8HS	TL 084 150 GB
MAU 6030	Unloading of Petrol into Storage at Petrol Stations	Forest Services	489 London Road, Hemel Hempstead, Hertfordshire, HP3 9BE	TL 045 059 GB
DBC/EP/17	Unloading of Petrol into Storage at Petrol Stations	Rontec Watford Ltd	Warners End Road, Northridge Way, Hemel Hempstead, Hertfordshire, HP1 3QF	TL 042 074 GB
MAU 6031	Unloading of Petrol into Storage at Petrol Stations	Marco Polo Enterprises	Jet, Queensway Service Station, 101 Queensway, Hemel Hempstead, Hertfordshire, HP2 5HD	TL 057 077 GB
MAU 6032	Unloading of Petrol into Storage at Petrol Stations	Somerfield	Cupid Green Service Station, Redbourn Road, Hemel Hempstead, Hertfordshire, HP2 7BA	TL 073 093 GB
SR 207758	Unloading of Petrol into Storage at Petrol Stations	Park Garage Group	Kings Langley Service Station, 124 Hempstead Road, Kings Langley, Hertfordshire, WD4 8AL	TL 069 041 GB

Appendix B

Monthly Diffusion Tube Data

The table below presents monthly mean NO₂ concentrations as measured at the 41 diffusion tube monitoring sites in 2011. The presented data have not been bias adjusted or annualised.

Site ID	Location	NO ₂ (µg/m ³)											
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
DC40	Sawyers Way	41	40	59	19	16	16	7	16.8	22.4	32.6	47.7	28.9
DC42	Wood Lane End	46	38	36	34	19	16	17	22.5	26.3	33.3	44.2	20.7
DC43	Roman Way Markyate	37		27		14	10	14	16.5		23.4	37.8	18.5
DC46	High Street Bovington		38	35	25	18	17	18	20.1	23.1	33.1	43.4	22.6
DC47	High Street Berkhamsted	60	56	53	44	34	35	36	38.4	43	52.1	62.1	47
DC48	Prince Edwards Street Berkhamsted	36	34	31	22	15	22	13	15.3	16.9	28.7	40.3	22.5
DC50	High Street Northchurch	67	54	50	39	32	33	37	28.7	31.2	47.6	60.8	31
DC51	Brook Street Tring	50	40	44	32	24	22	22	23.9	25.8		49.2	26.3
DC52	High Street Tring	48	49	49	36	33	33	22	32.3	35.2	43.8	54.8	43.6
DC53	Charles Street Tring	29	27	23	16	10	10	10	12.2	14.3	22.1	34	17.2
DC54	Watford Road Kings Langley	77	70	34	49	50	52	40	46.1	57.7	60.9	67.1	63.6
DC55	High Street Kings Langley	48	57	49	38	25	24		26.8	36.9	38.4	61.4	40.6
DC57	Lawn Lane 1 HH	84	74	80	62	49	44	49	65.8	53.5	66.6	76.7	55.4
DC58	Gammons Lane HH	51	42	42	32	25	23	22	29.4	27.3	33.2	48.8	32.2
DC59	Wadley Close HH	48	54	51	41	33	33		29.9	34.6	48.3	58.3	30.1
DC60	Field Road HH	45		40	29	21	19	19	22.9	25.3	35.9	48.9	25.7
DC61	St Agnells Lane HH	48	49	41	31	21	27	21	29.8	34	46.7	52.8	35.7
DC62	New Road Northchurch	70	69	62	45	45	52	34	42.1	54.7	62.8	72.7	50.6
DC63	Darrs Lane Northchurch	56	43	41	31	28	26	21	34.7	26.1	39.9	50.7	31
DC64	Lawn Lane 2 HH	61	56	48	42	31	31	49	53.3	37.4	50.2	60.4	42.6

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Site ID	Location	NO ₂ (µg/m ³)											
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
DC65	Lawn Lane 3 HH	90	82	75	63	60	58	46	37	72.7	81.2	77.5	74.3
DC66	London Road Apsley	87	83	70	65	61	64	51	62.1	66.9	81.4	86.4	68.4
DC67	Allandale	45	47	42	31	22	23	19	25.8	26	42	52.6	25.9
DC68	Belswains Sappi	57	56	48	40	37	41	36	31.3	42.4	51.5	55.4	50.3
DC69	Lawn Lane Belswains		41	35	27	16	17	16	21.6	22.1	30.9	40.3	31.4
DC70	Lawn Lane 4 HH	65	59	58	50	38	32	31	35.6	36.8	51.6	70.8	41.6
DC71	Orchard Street	48	44	40	35	22	21	20	25.7	27.1	36.4	54.7	34.5
DC72	London Featherbed	63	58	21	39	34	43	31	40.9	43.2	52.6		
DC73	Durrants Hill Road	52	53	47	39	29	29	28	33.7	34.5	41.9	57.4	33.2
DC74	Avia Close	68		62	48	39	41	39	42.3	47.3	57	56.8	50.5
DC75	The Meads	45	41	32	28	23	25	20	25.4	27	40.3	47.3	32.9
DC76	The Cotterells	59	55	52	38	34	34	29	36.6	34.1	44.4	58.6	39.1
DC77	Cotterells 1					8	27	20	24.5	25.1	44.1	55.1	23.4
DC78	Cotterells 2					25	22	21	24.8	26.3	38.3	53.2	35.8
DC79	Cotterells 3					10	26	22	25.6	29.5	34.7	58.37	38.2
DC80	Sappi 1					12	37	41	44.6	39.4			
DC81	Sappi 2					55			37.8	44.6	52.8	55.7	52.9
DC82	Sappi 3					10	34	32	35.1	45.5	44.3	53.6	46.2
DC83	Briar Way						10	9	12.3	13.5	20.4	30.1	15.2
DC84	AQ Machine						26	21	28.5	28.9	44.8	58.1	34.3
DC85	Health Centre, London Road									38	53.4	75.4	0.7

Annualisation:**Annual Mean/Period Mean Ratios**

The table below presents, for 2011, monthly and annual mean NO₂ concentrations as measured at two urban background continuous monitoring stations located within 50 miles of the diffusion tube monitoring sites in Dacorum borough.

Automatic Monitoring Site	2011 Data Capture (%)	Site Type	2011 Monthly Mean NO ₂ (µg/m ³)												2011 Annual Mean No ₂ (µg/m ³)
			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
East Herts DC - Sawbridgeworth Background	96.8	Urban Background	21	25	23	15	11	13	11	11	15	14	22	14	16
Welwyn Hatfield Council Offices	98.8	Urban Background	23	33	27	23	18	18	15	20	28	30	38	27	25

Source: Hertfordshire and Bedfordshire Air Quality Network (www.hertsandbedsair.net)

The tables below present the average annual mean (AM) / period mean (PM) ratios derived from the automatic monitoring data and subsequently applied to the (period mean) diffusion tube measurement data.

Period Means **PM**

	May - Dec	May - Sept	May	Aug - Dec	June - Dec	Sept - Dec
EHDC	13	13	10	15	15	15
WHBC	23	19	17	29	25	31

May - Dec

AM/PM Ratio

	AM	PM	Ratio
EHDC	16	13	1.231
WHBC	25	23	1.087
		Average (Ra)	1.159

May - Sept

AM/PM Ratio

	AM	PM	Ratio
EHDC	16	13	1.231
WHBC	25	19	1.316
		Average (Ra)	1.273

May

AM/PM Ratio

	AM	PM	Ratio
EHDC	16	10	1.600
WHBC	25	17	1.471
		Average (Ra)	1.535

Aug - Dec

AM/PM Ratio

	AM	PM	Ratio
EHDC	16	15	1.067
WHBC	25	29	0.862
		Average (Ra)	0.964

Jun - Dec

AM/PM Ratio

	AM	PM	Ratio
EHDC	16	15	1.067
WHBC	25	25	1.000
		Average (Ra)	1.033

Sept - Dec

AM/PM Ratio

	AM	PM	Ratio
EHDC	16	15	1.067
WHBC	25	31	0.806
		Average (Ra)	0.937

Note: In reference to DC81 an average AM/PM ratio was calculated using a mean of the average AM/PM ratios derived for May and August to December 2011.

The table below presents the application of average AM/PM ratios to the (period mean) diffusion tube measurement data.

Site	Location	M	Ra	M x Ra	Bias adjusted
DC77	Cotterells 1	28.4	1.159	32.9	27.6
DC78	Cotterells 2	30.8	1.159	35.7	30.0
DC79	Cotterells 3	30.6	1.159	35.5	29.8
DC80	Sappi 1	34.8	1.273	44.3	37.2
DC81	Sappi 2	49.8	1.25	62.3	52.3
DC82	Sappi 3	37.6	1.159	43.6	36.6
DC83	Briair Way	15.8	1.033	16.3	13.7
DC84	AQ Machine	34.5	1.033	35.7	29.9
DC85	Health Centre, London Road	41.9	0.937	39.2	33.0

Key:

M Measured mean concentration

Ra Average AM/PM ratio

NO₂ Diffusion Tube Locations

DC40 Sawyers Way, Hemel Hempstead

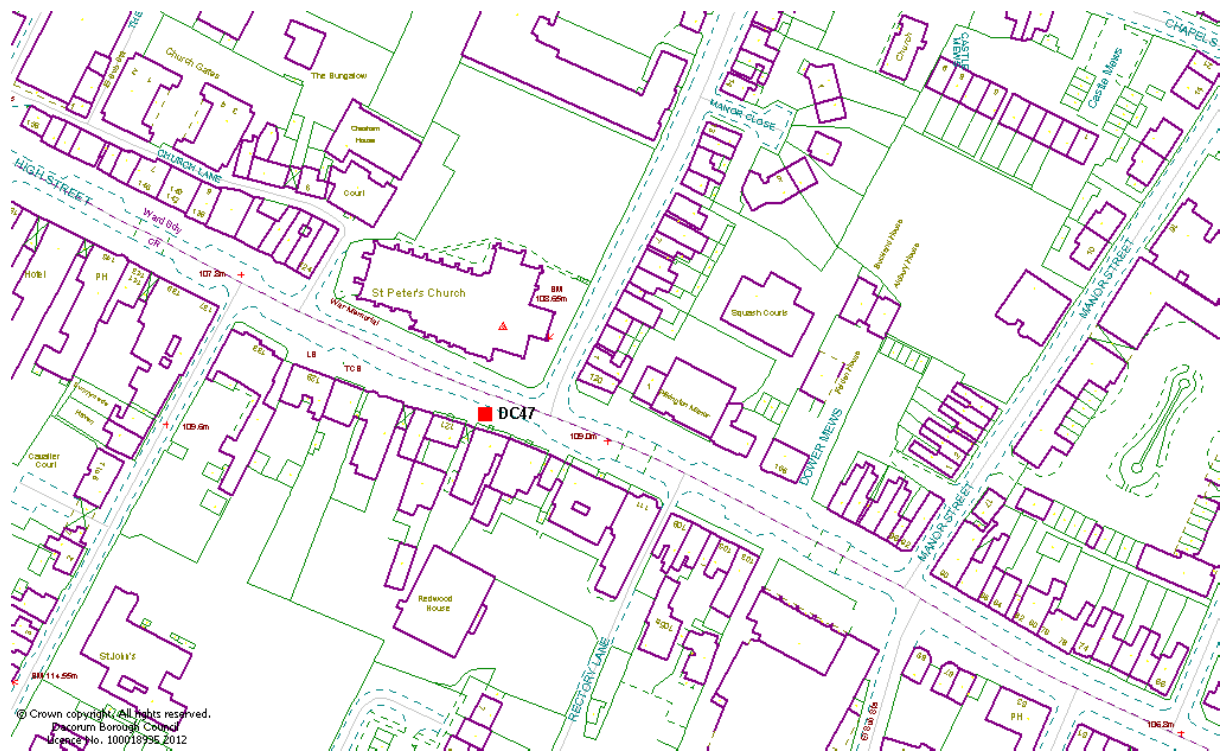


DC42 Wood Lane End, Hemel Hempstead





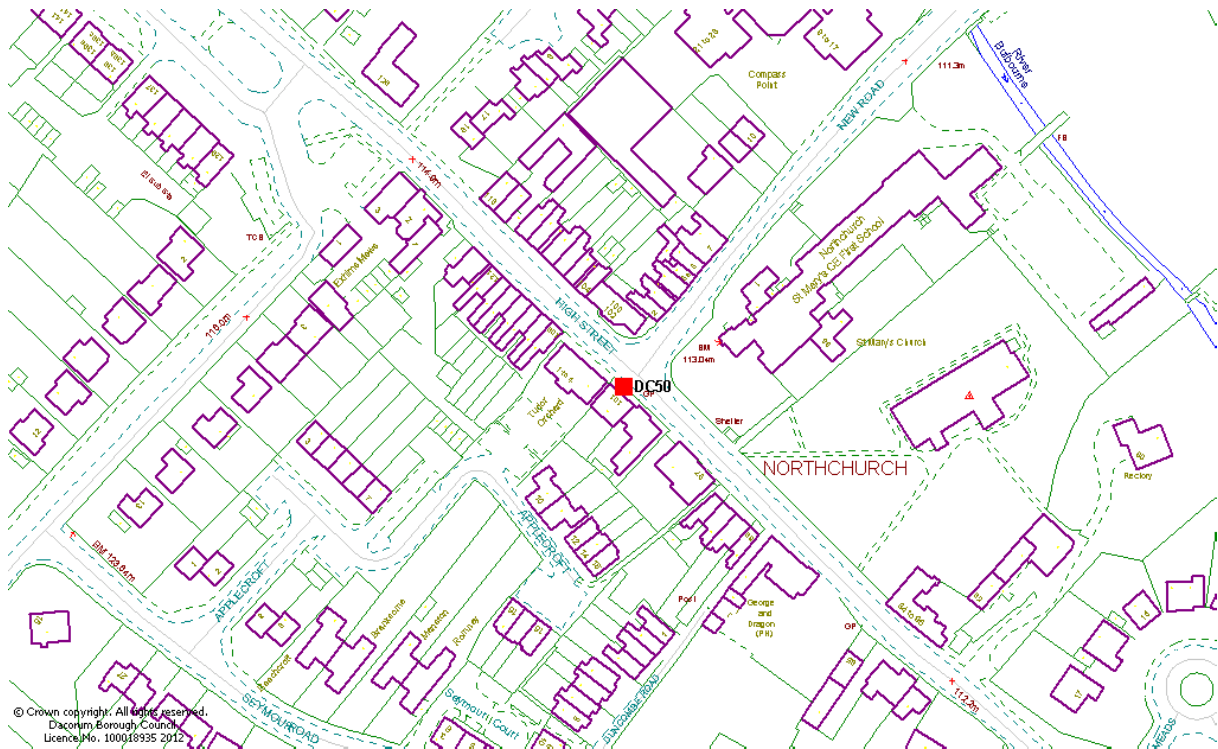
DC47 High Street, Berkhamsted



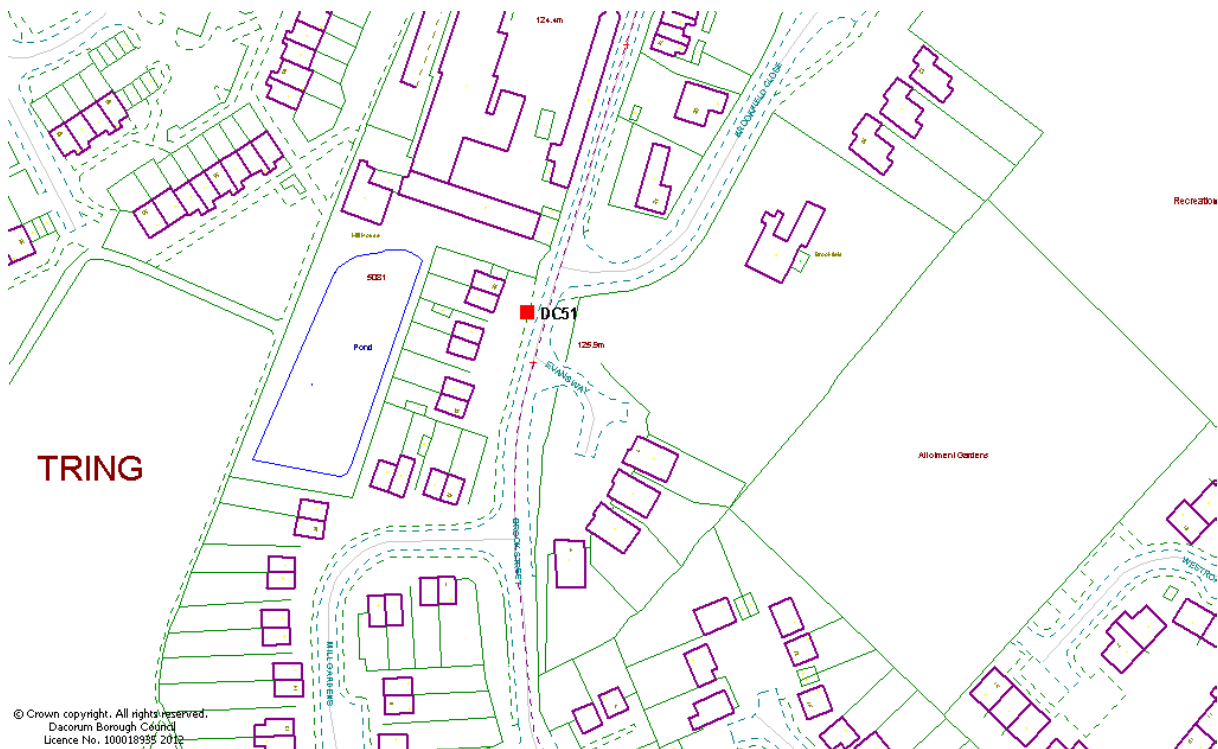
DC48 Prince Edward Street, Berkhamsted



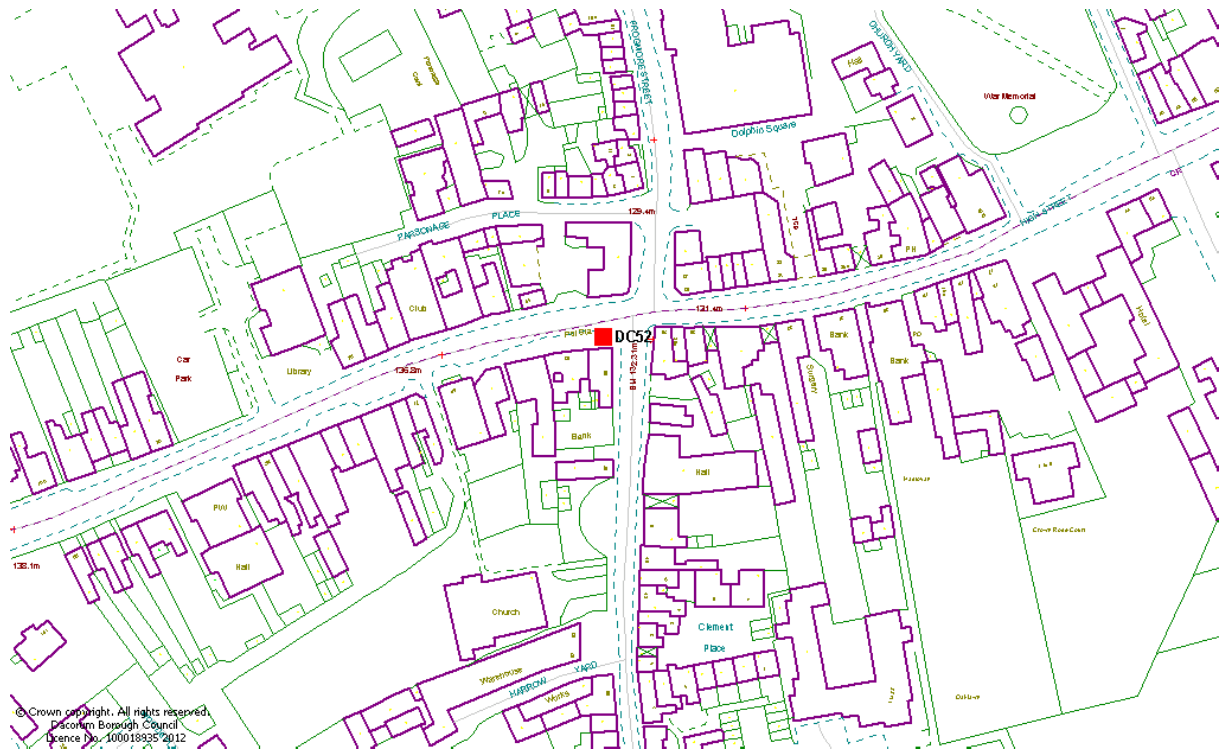
DC50 High Street, Northchurch



DC51 Brook Street, Tring



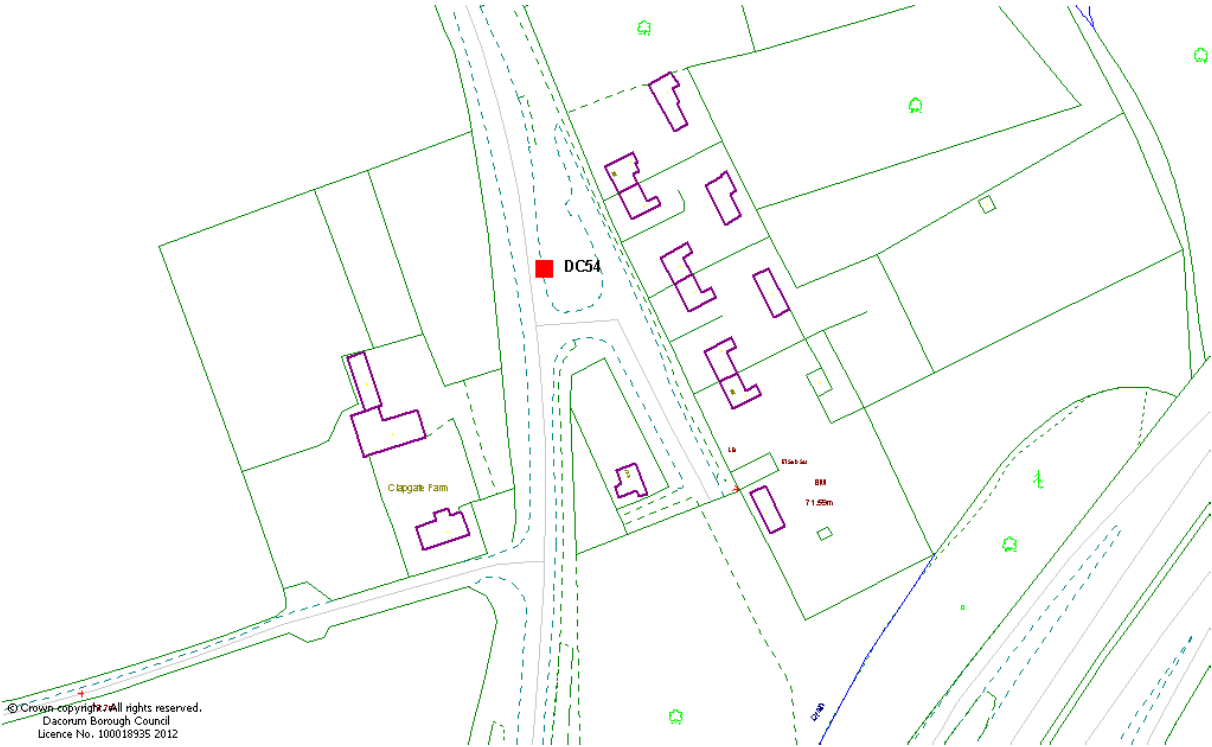
DC52 High Street, Tring



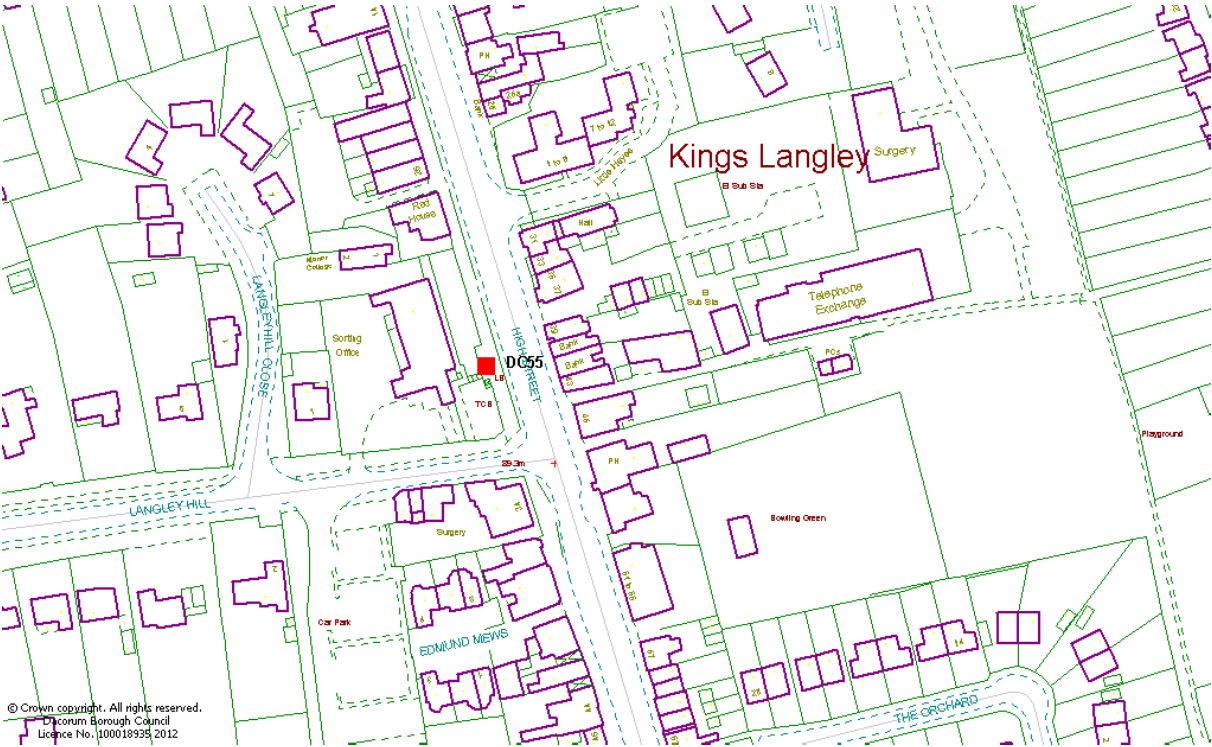
DC53 Charles Street, Tring



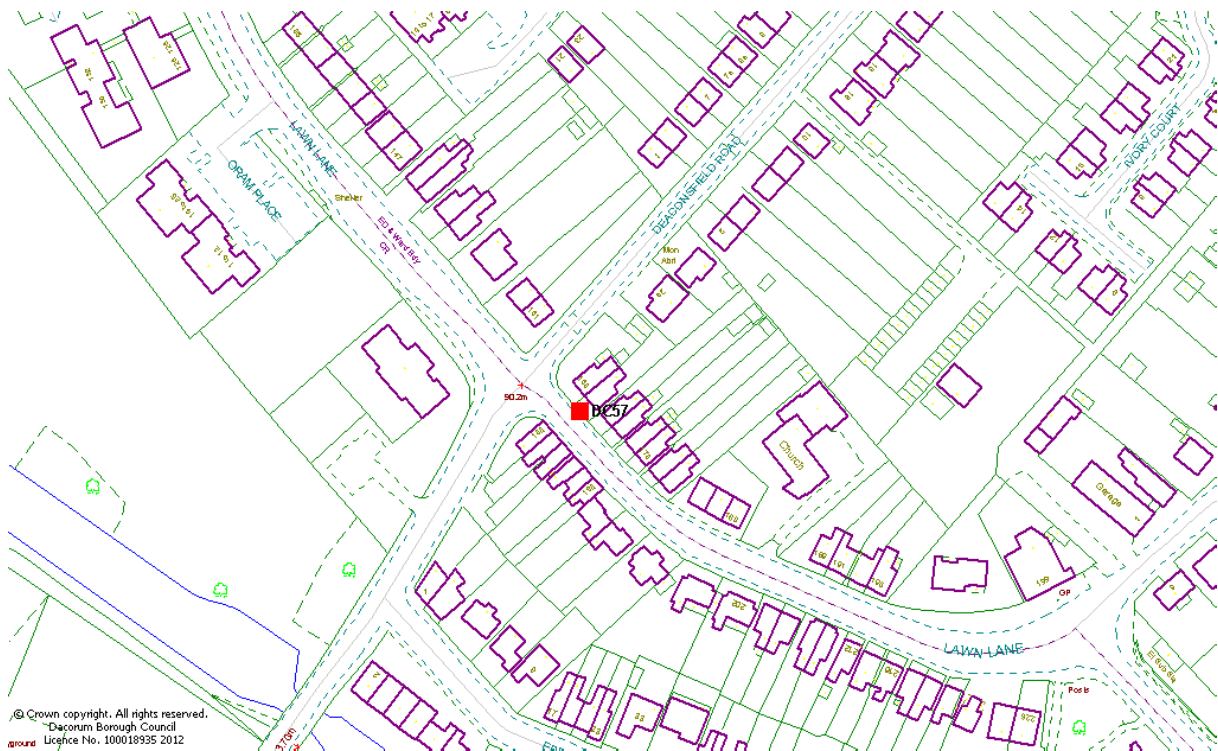
DC54 Watford Road, Kings Langley



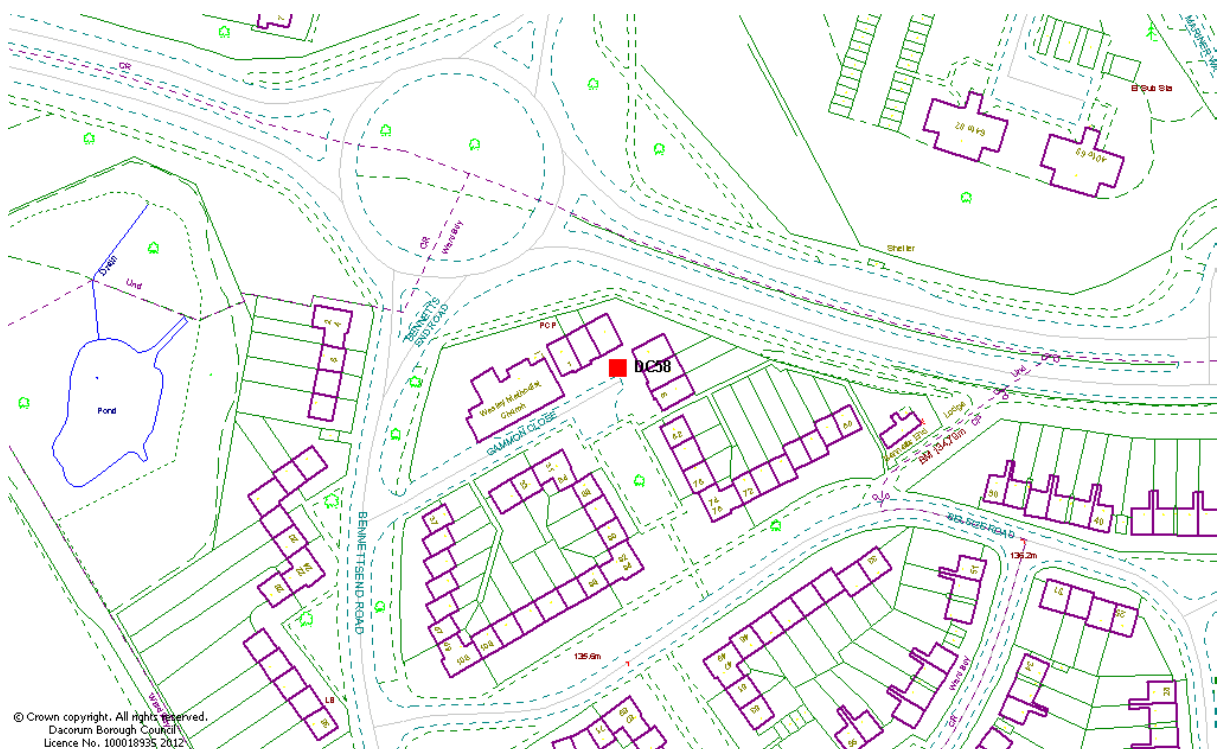
DC55 High Street, Kings Langley



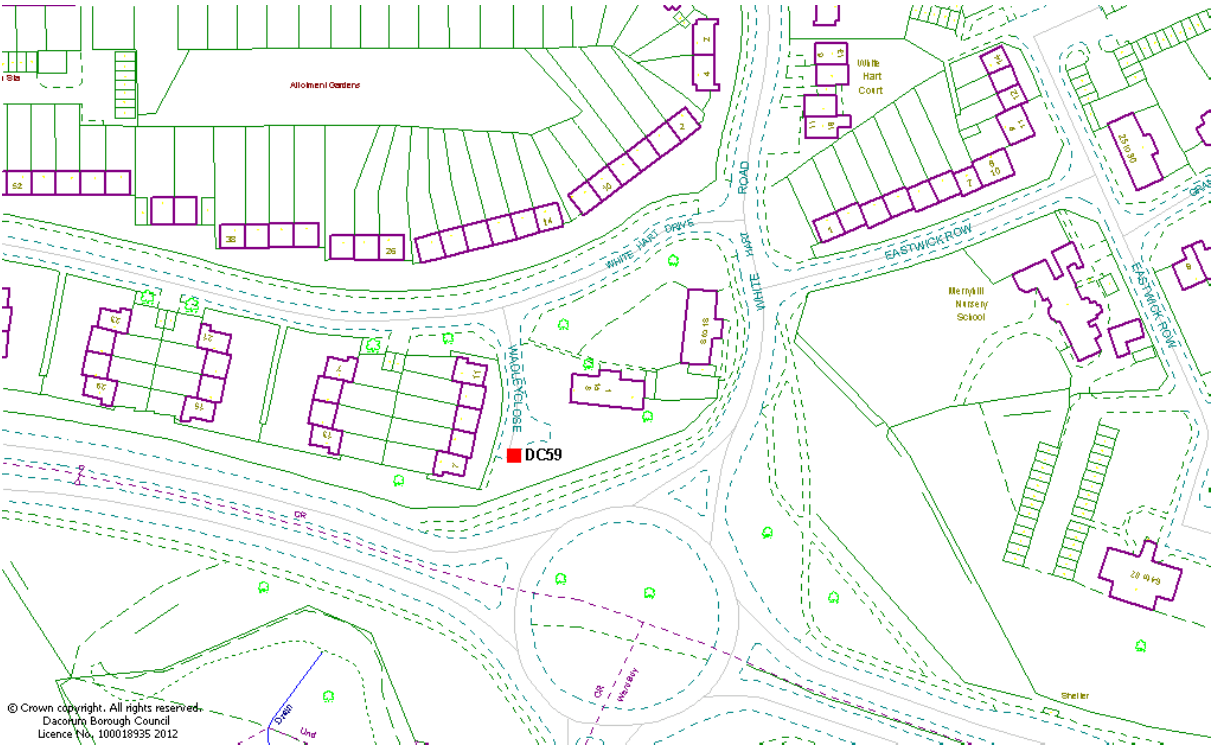
DC57 Lawn Lane 1, Hemel Hempstead



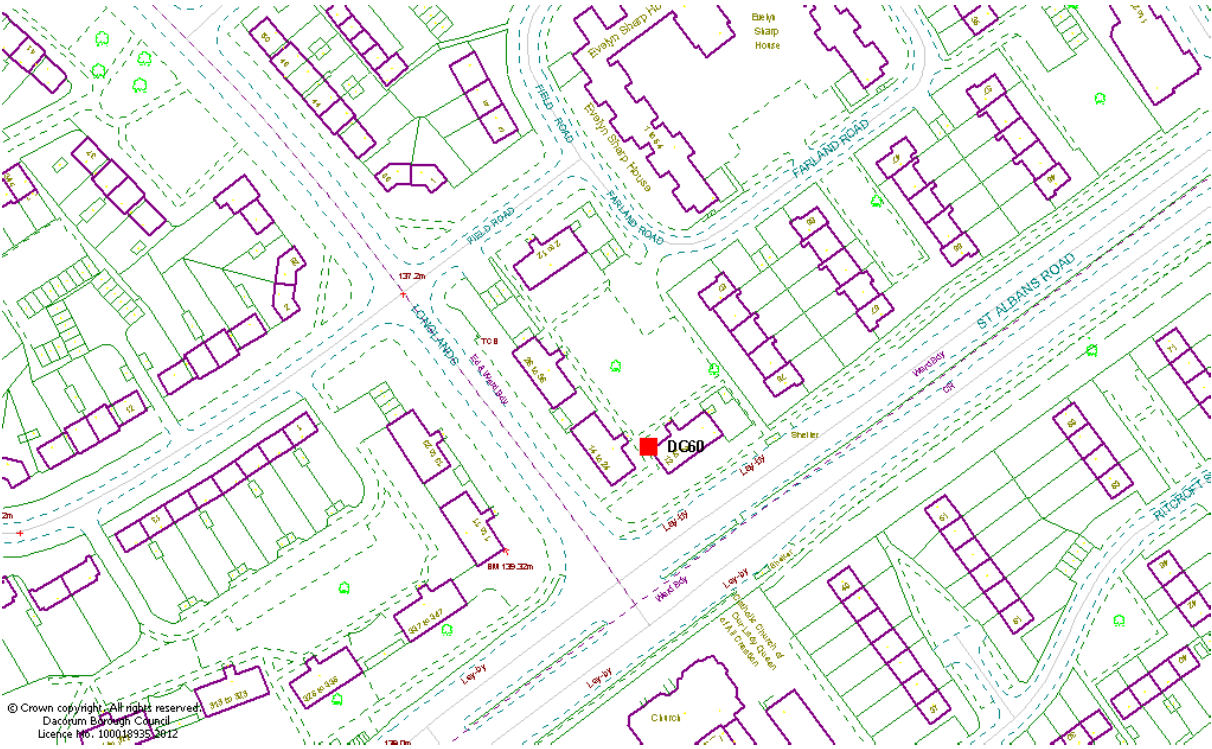
DC58 Gammons Lane, Hemel Hempstead



DC59 Wadley Close, Hemel Hempstead



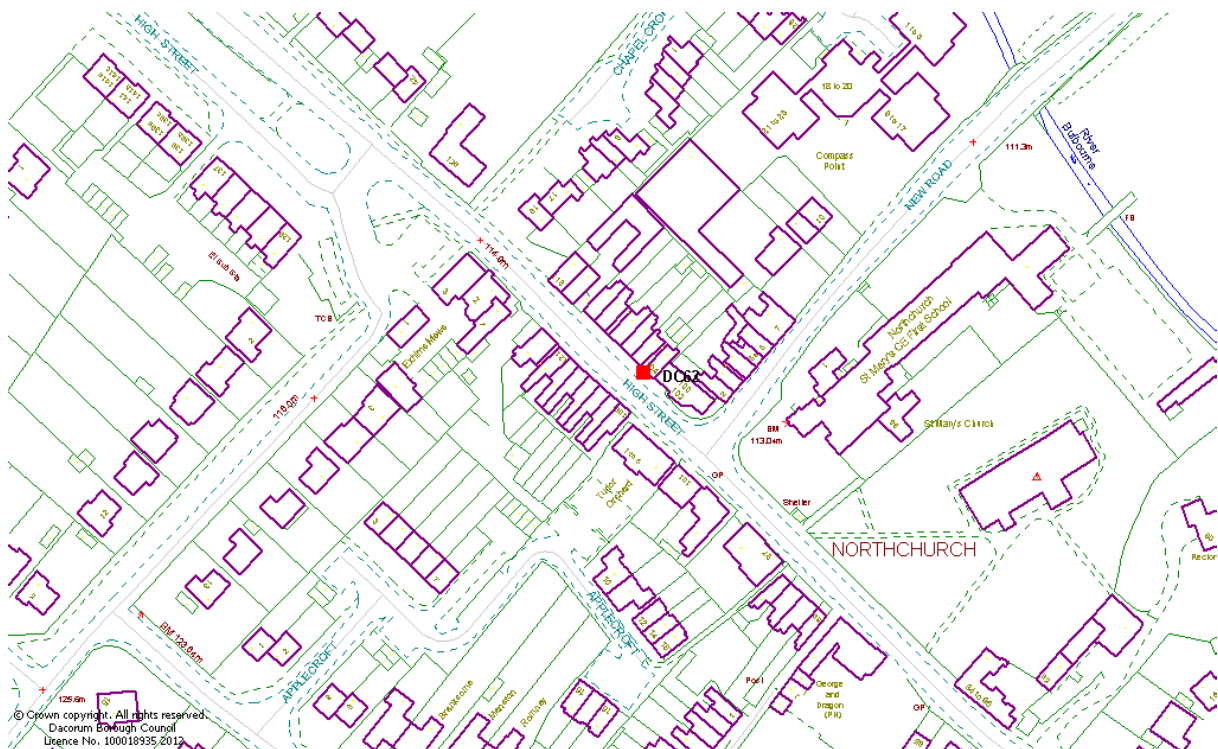
DC60 Field Road, Hemel Hempstead



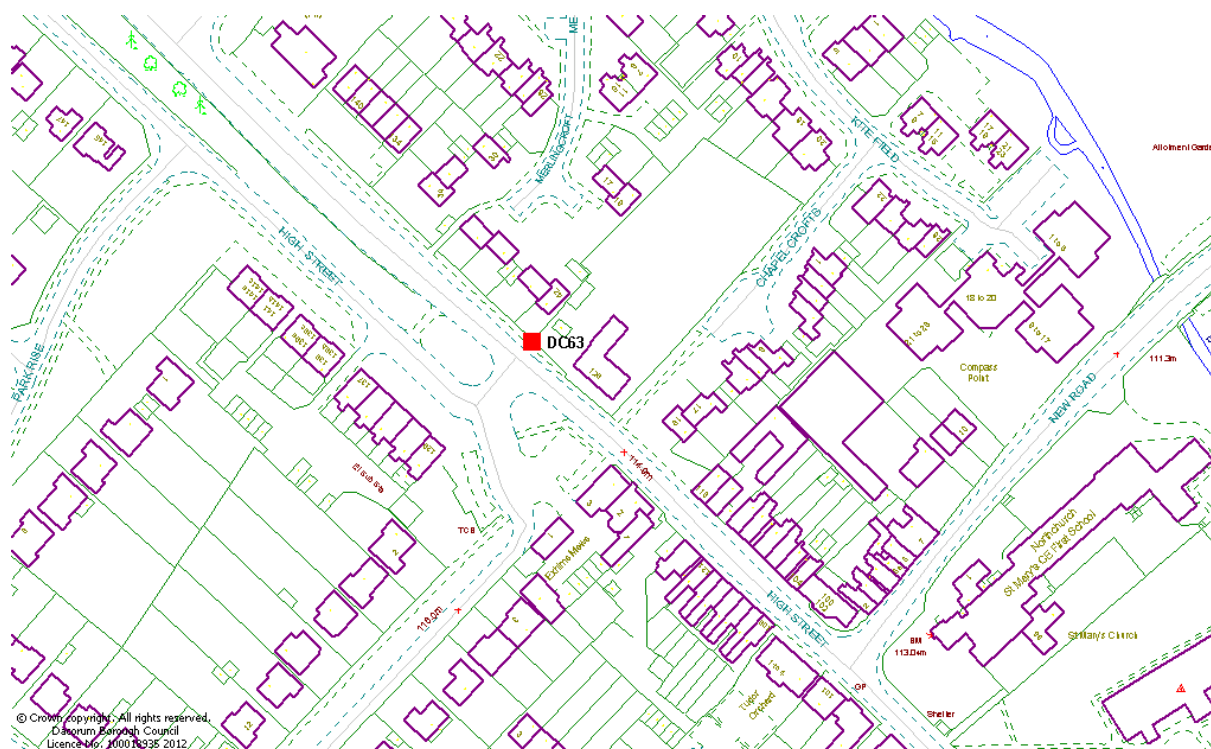
DC61 St Agnells Lane, Hemel Hempstead



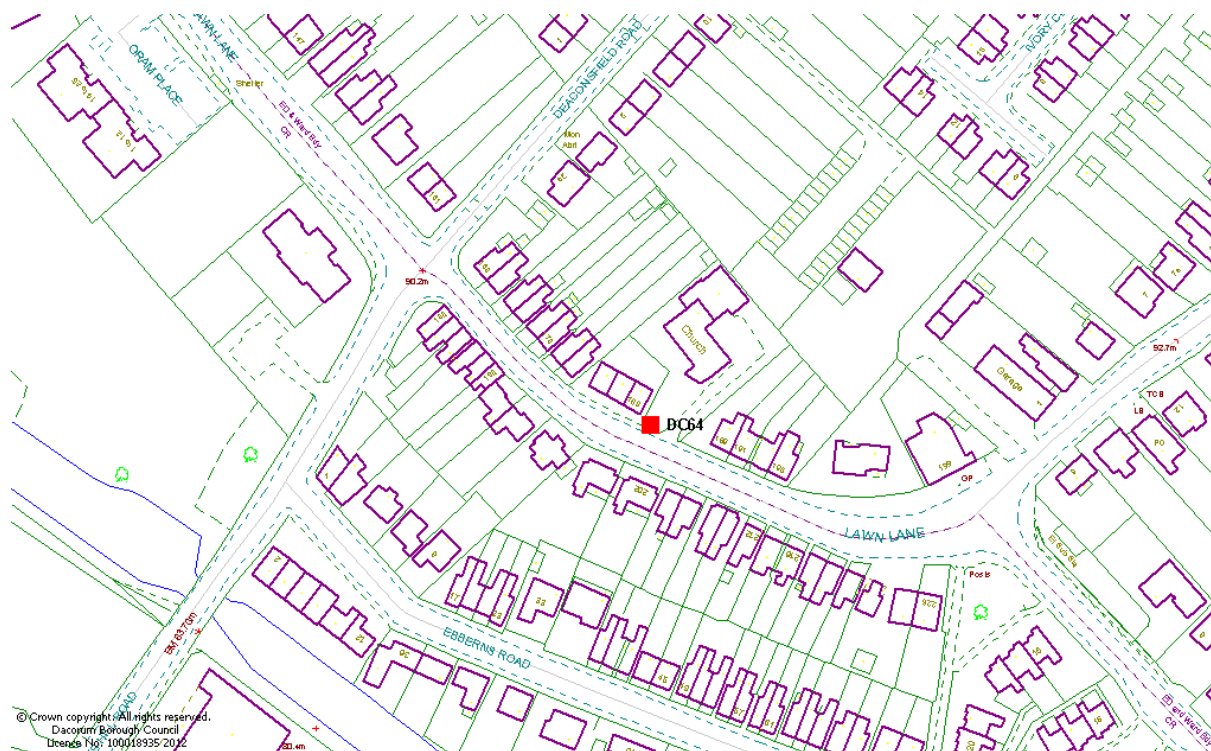
DC62 New Road, Northchurch



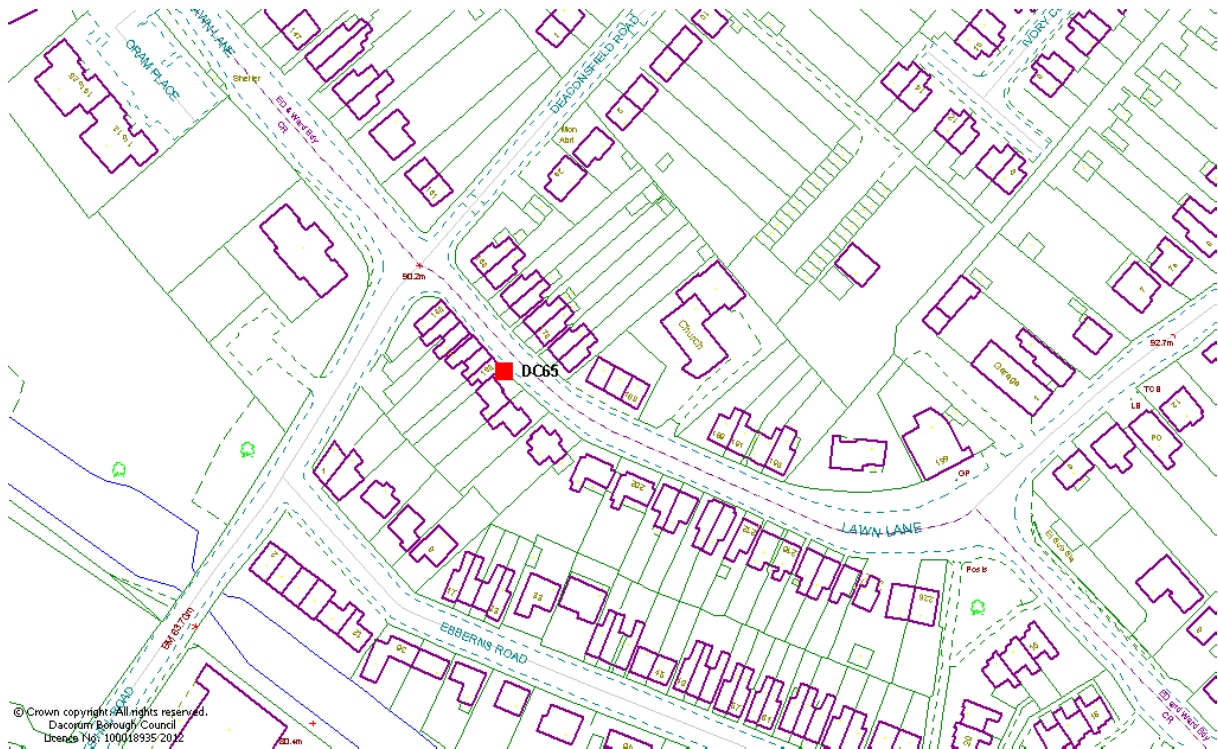
DC63 Darrs Lane, Northchurch



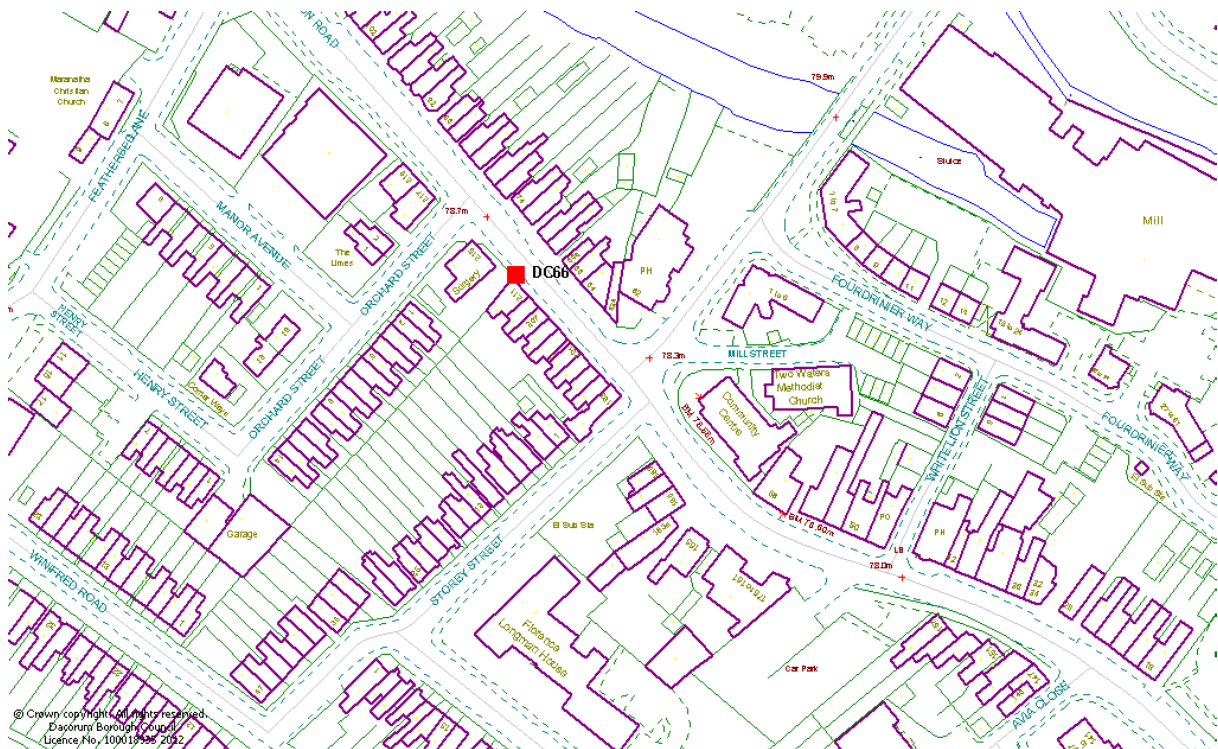
DC64 Lawn Lane 2, Hemel Hempstead



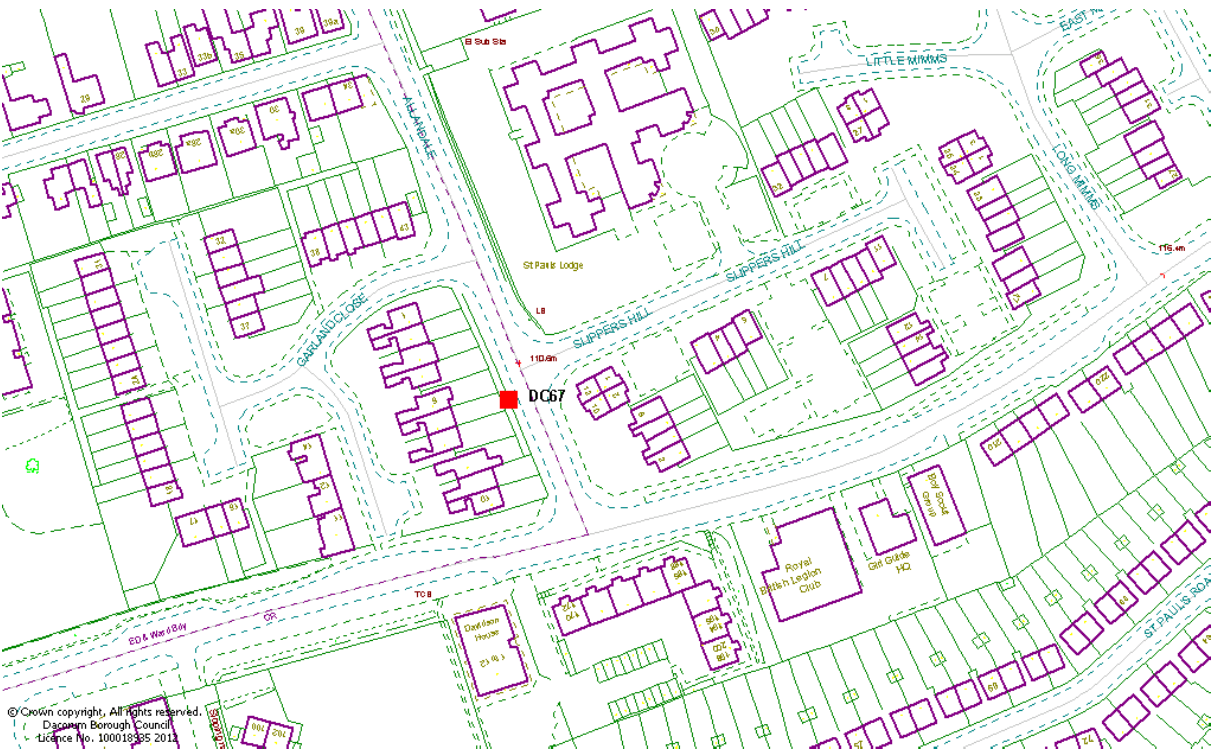
DC65 Lawn Lane 3, Hemel Hempstead



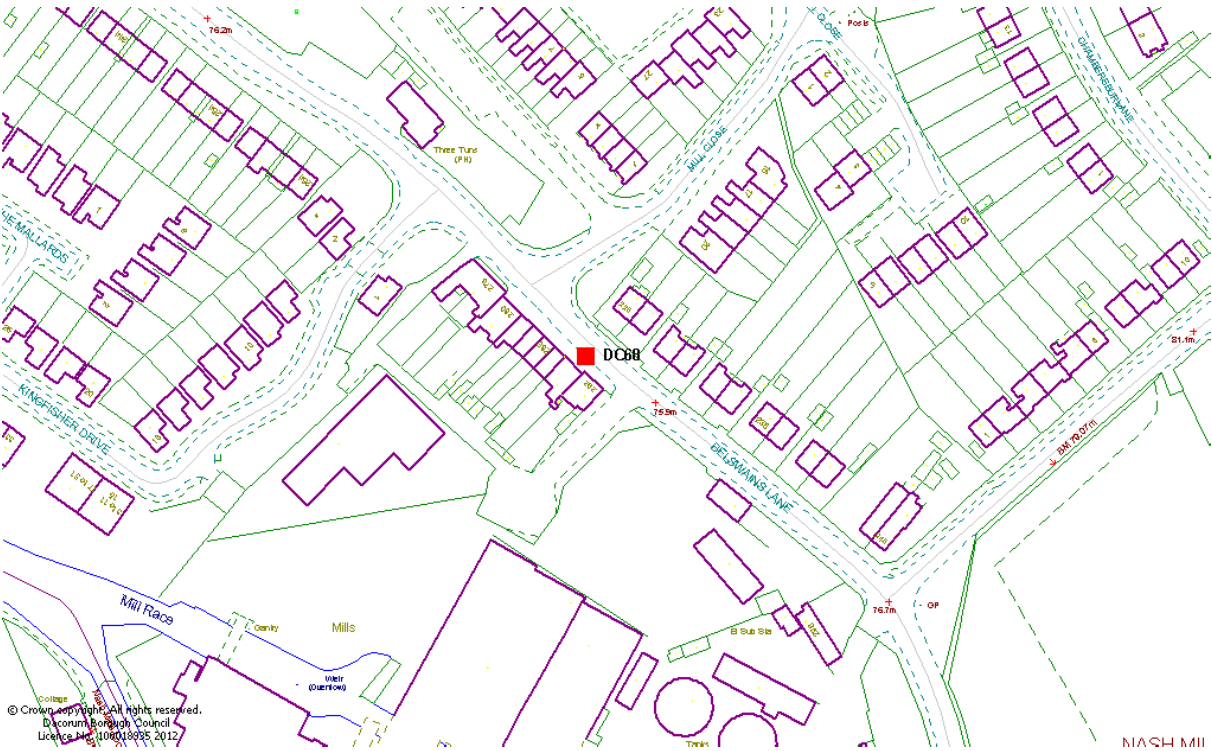
DC66 London Road, Apsley



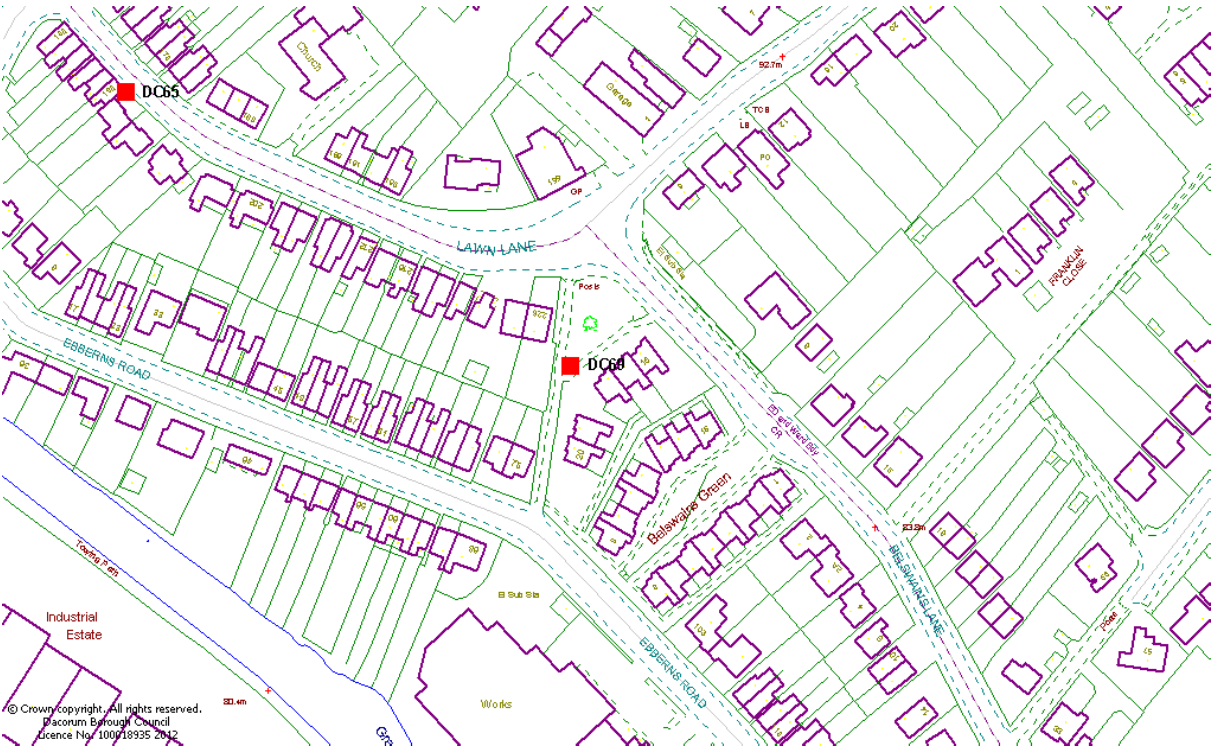
DC67 Allandale



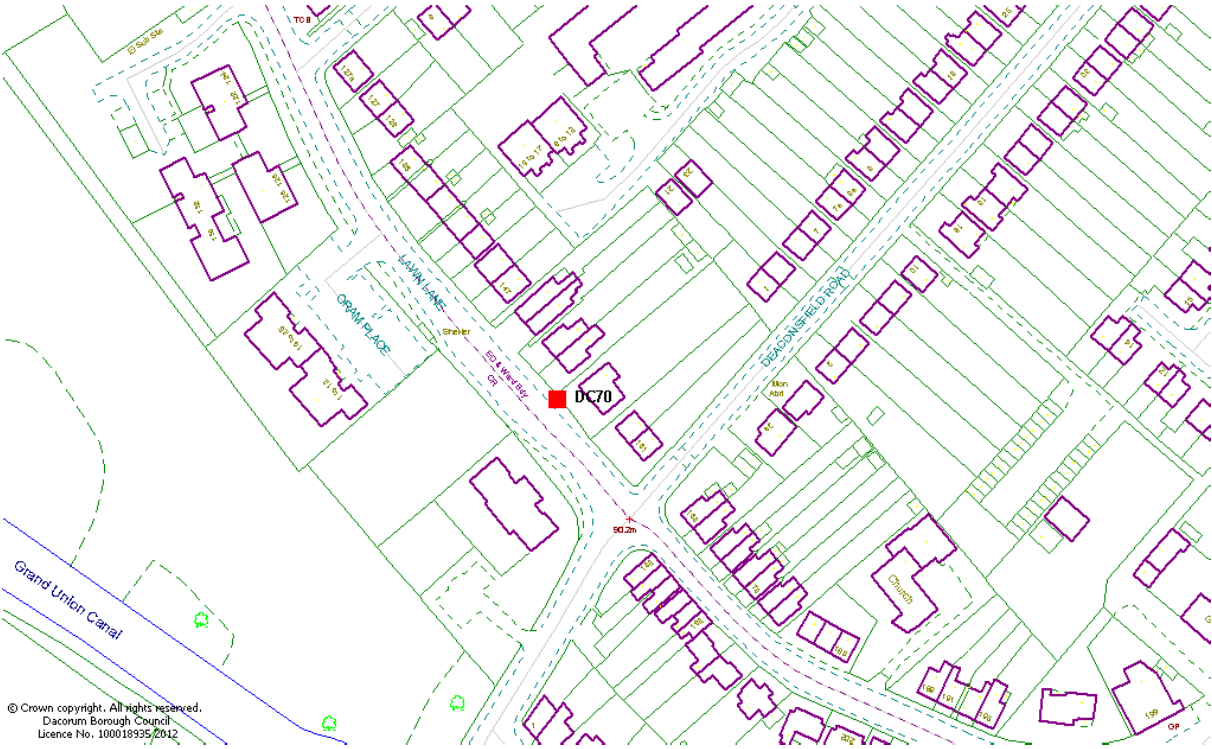
DC68 Belswains Sappi



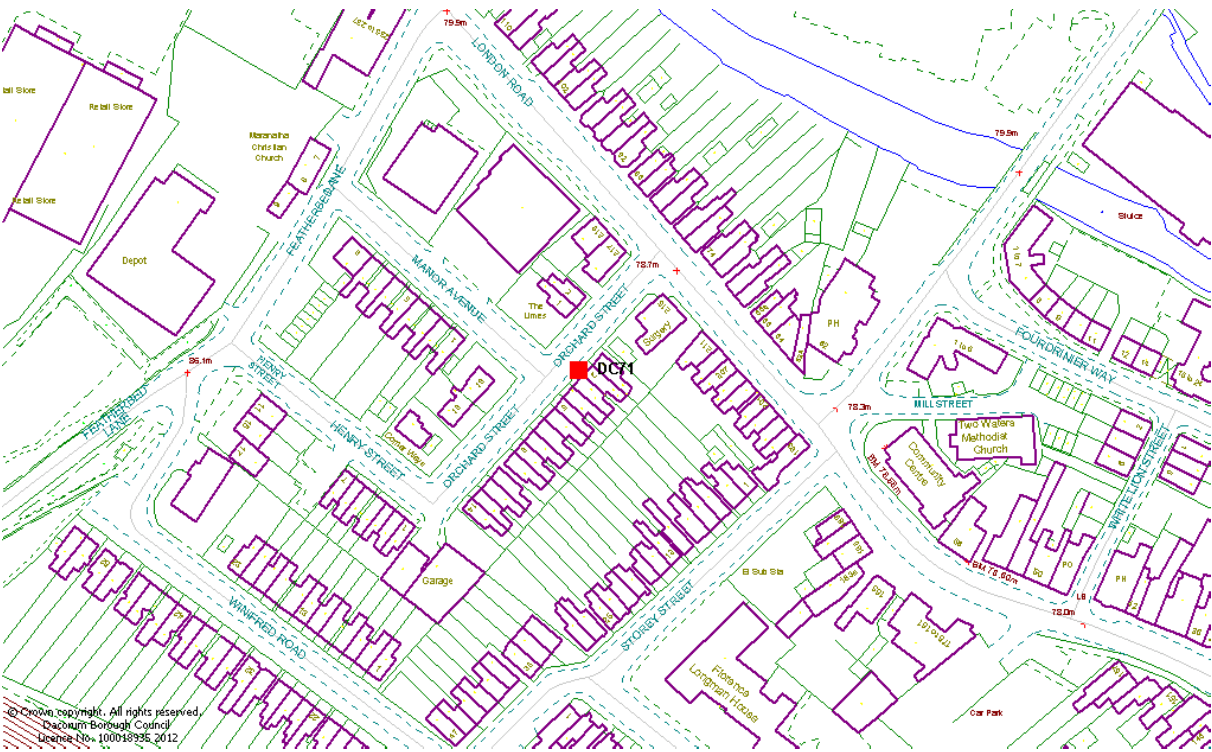
DC69 Lawn Lane, Belswains



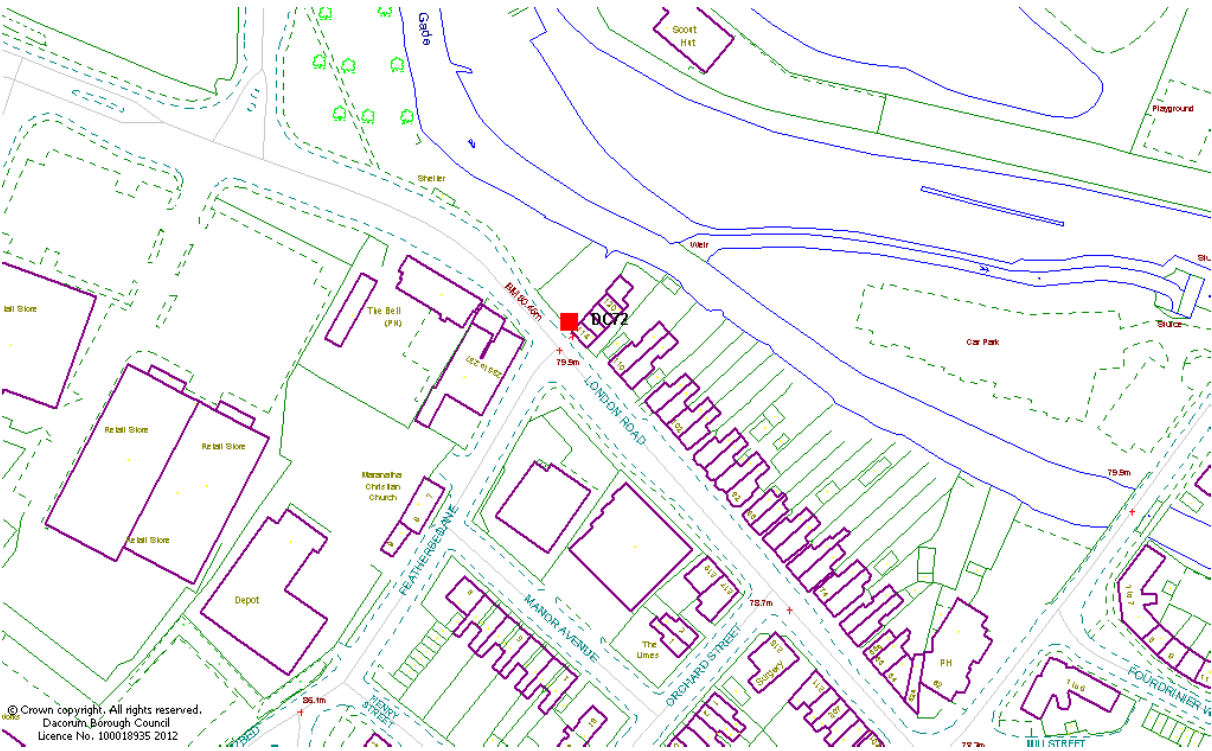
DC70 Lawn Lane 4, Hemel Hempstead



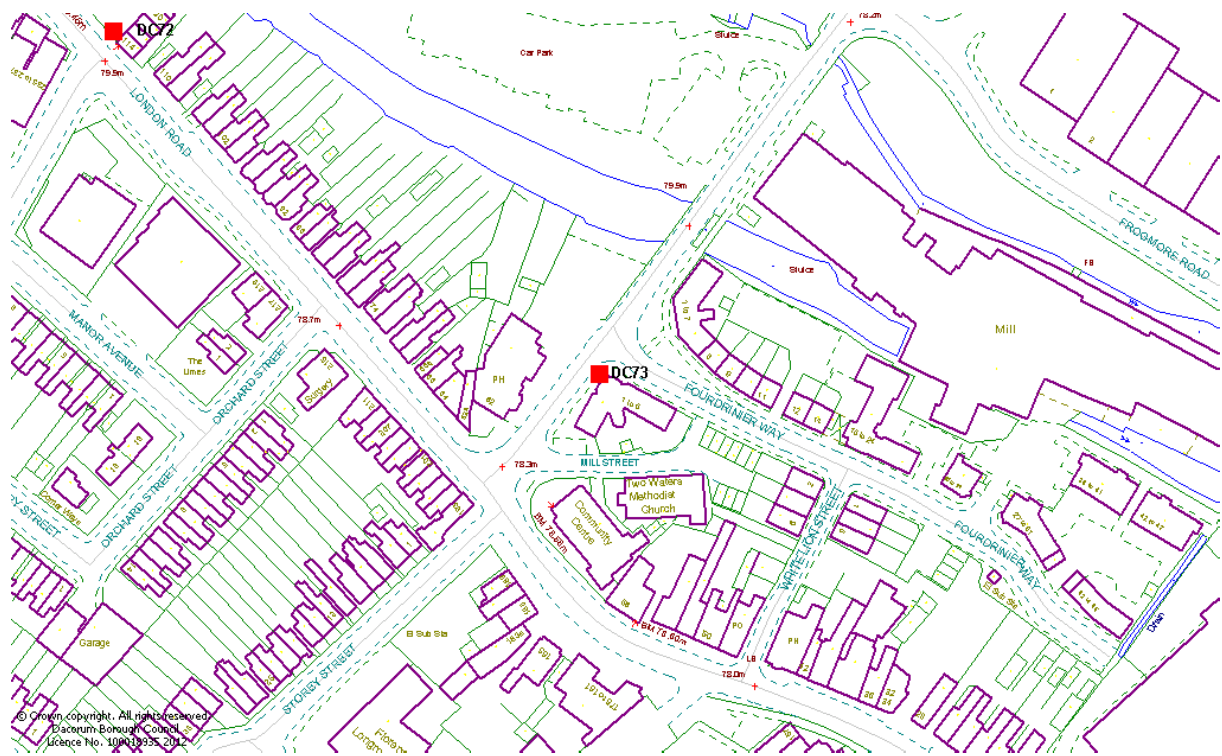
DC71 Orchard Street



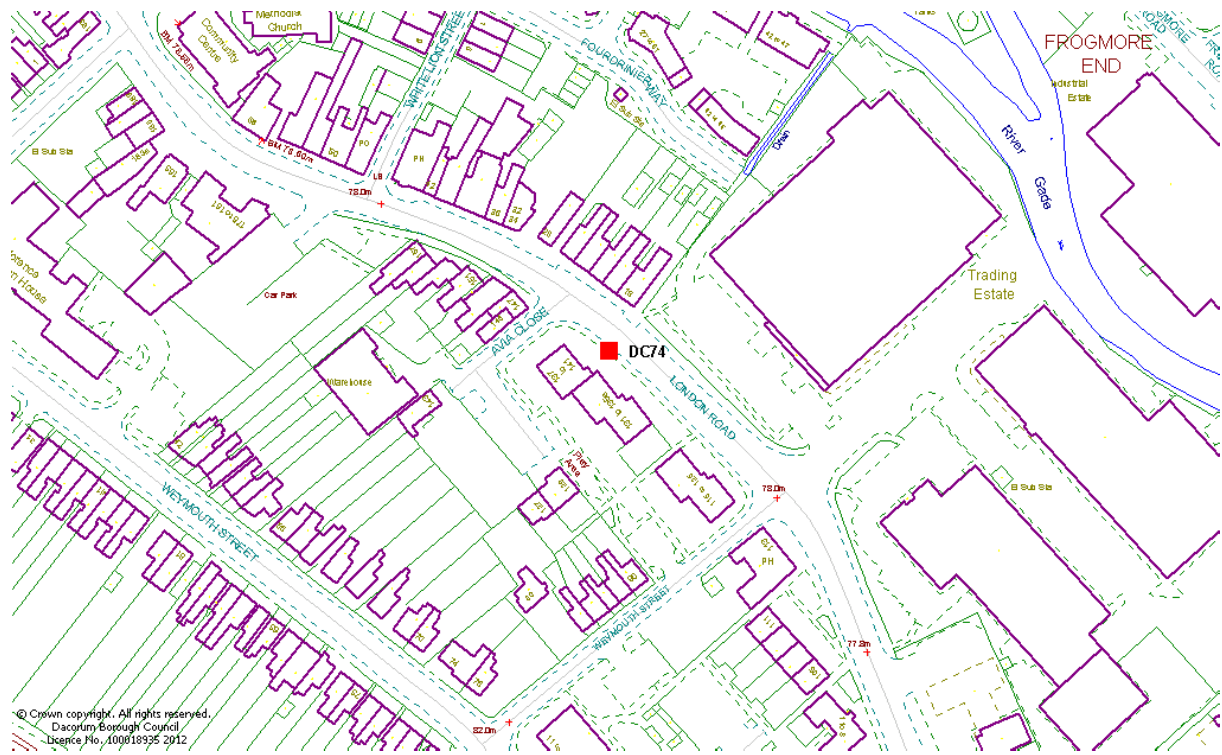
DC72 London Featherbed



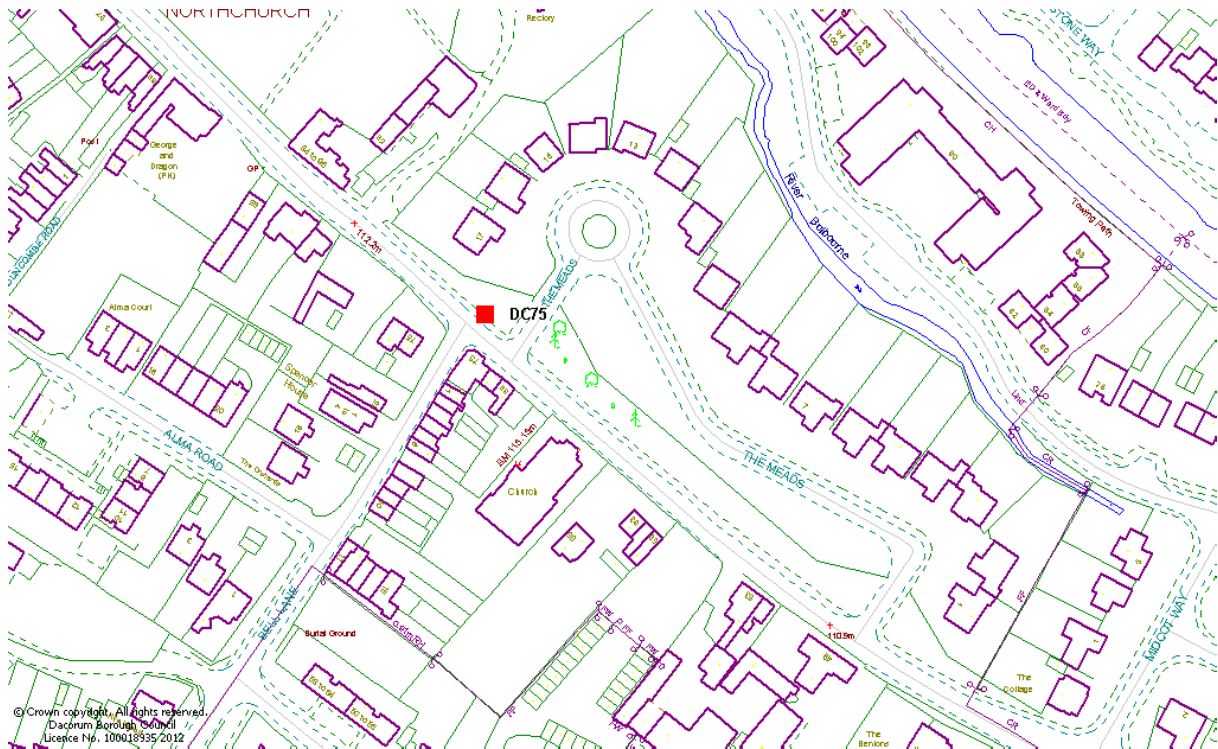
DC73 Durrants Hill Road



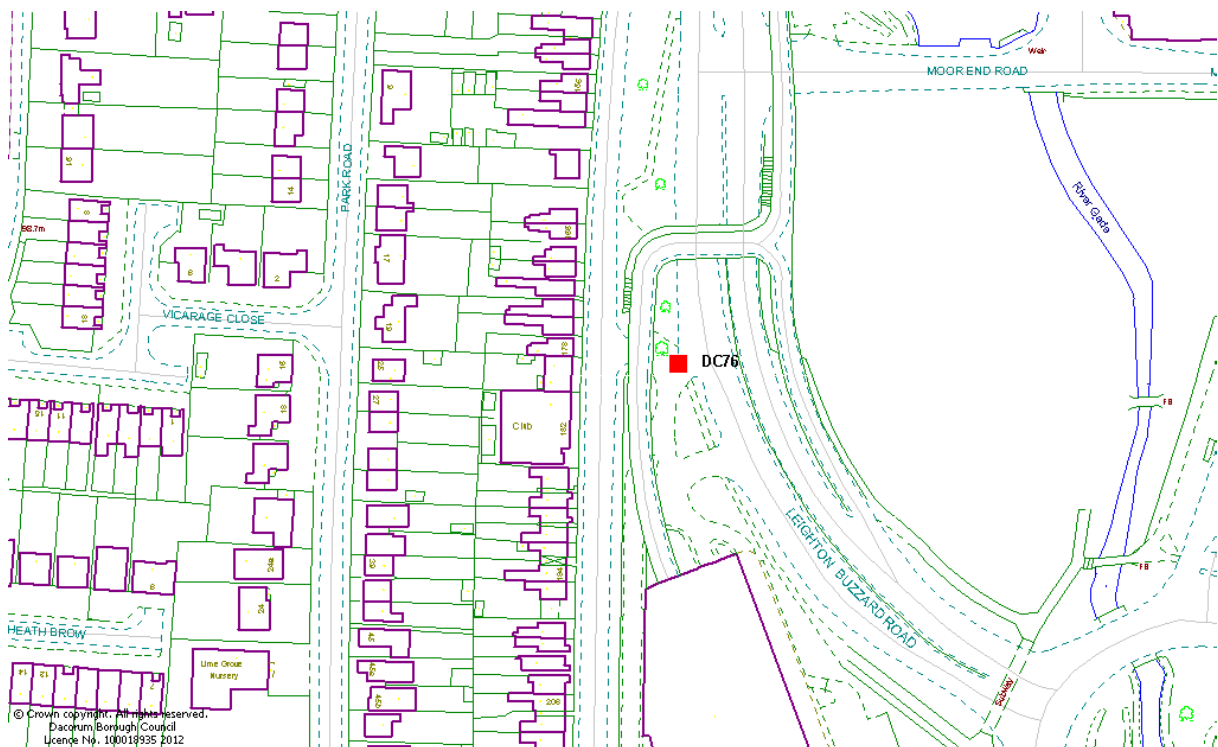
DC74 Avia Close



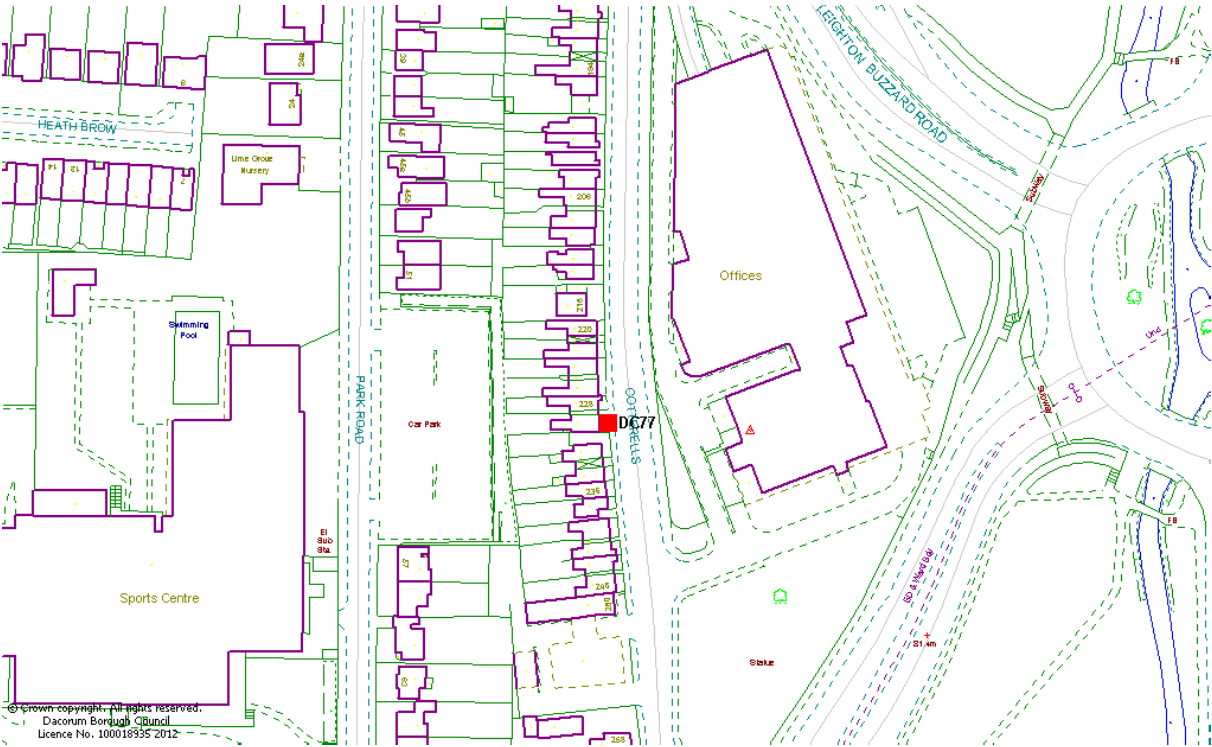
DC75 The Meadows



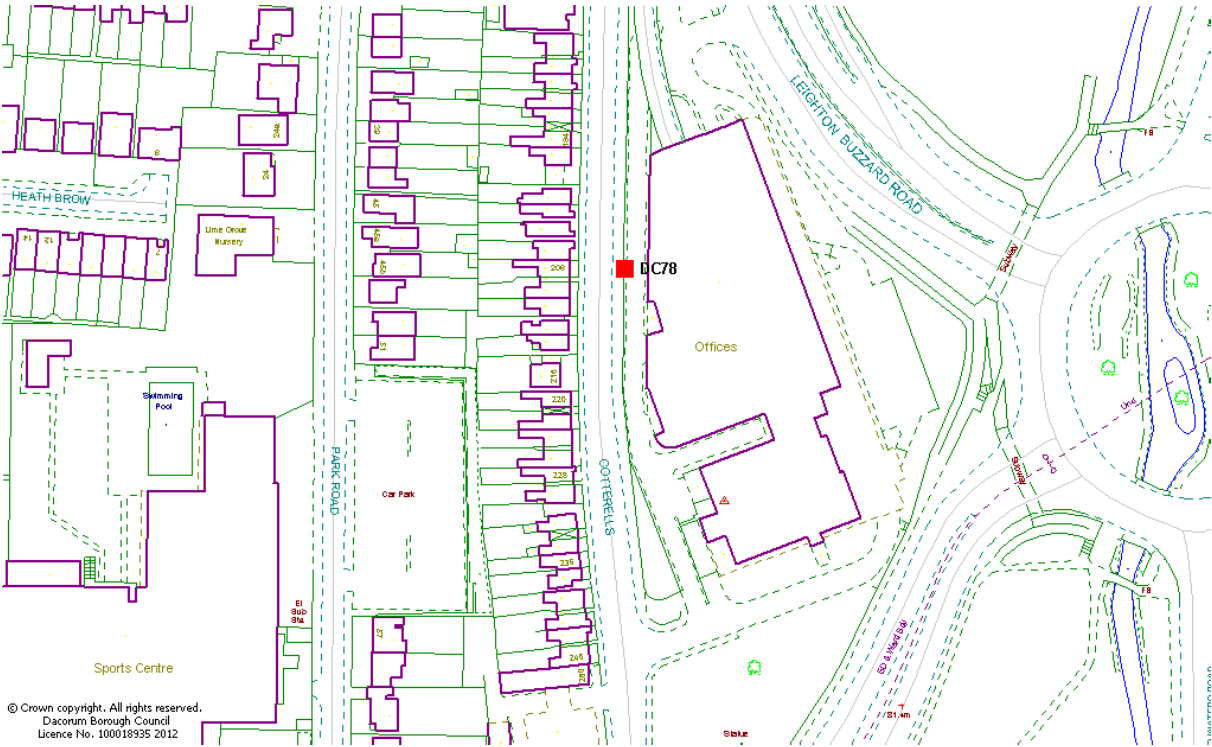
DC76 The Cotterells



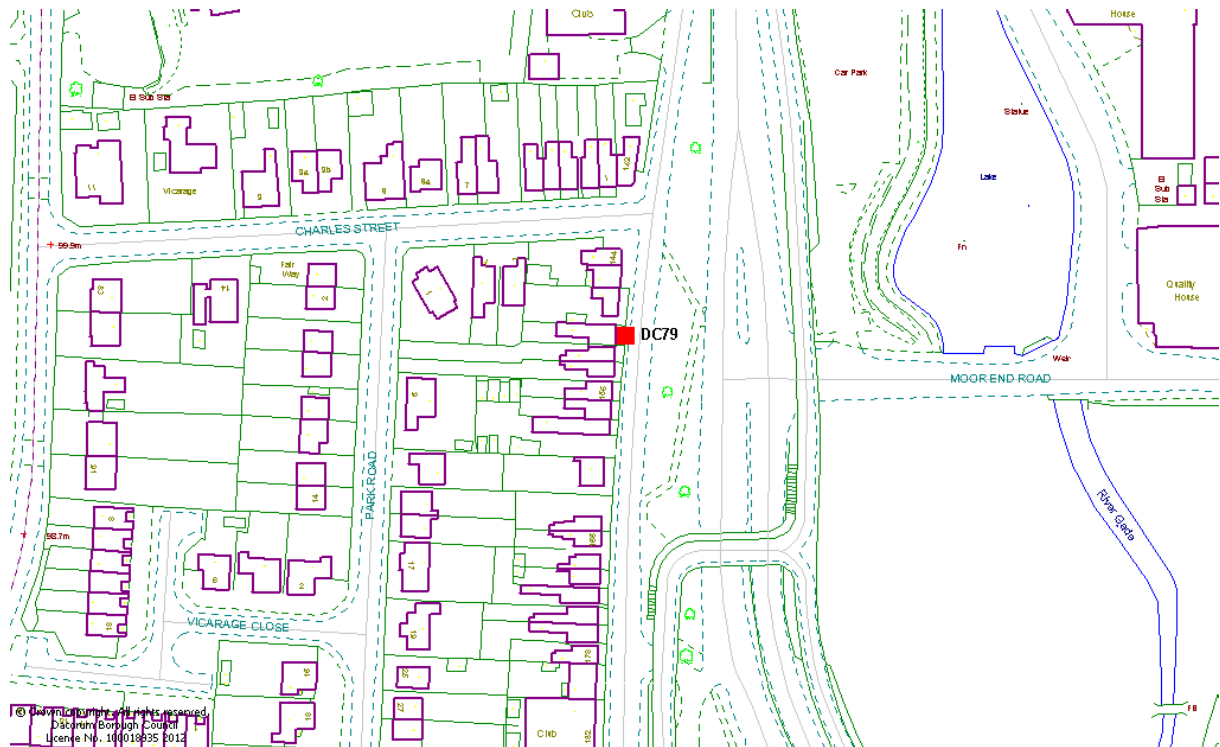
DC77 Cotterells 1



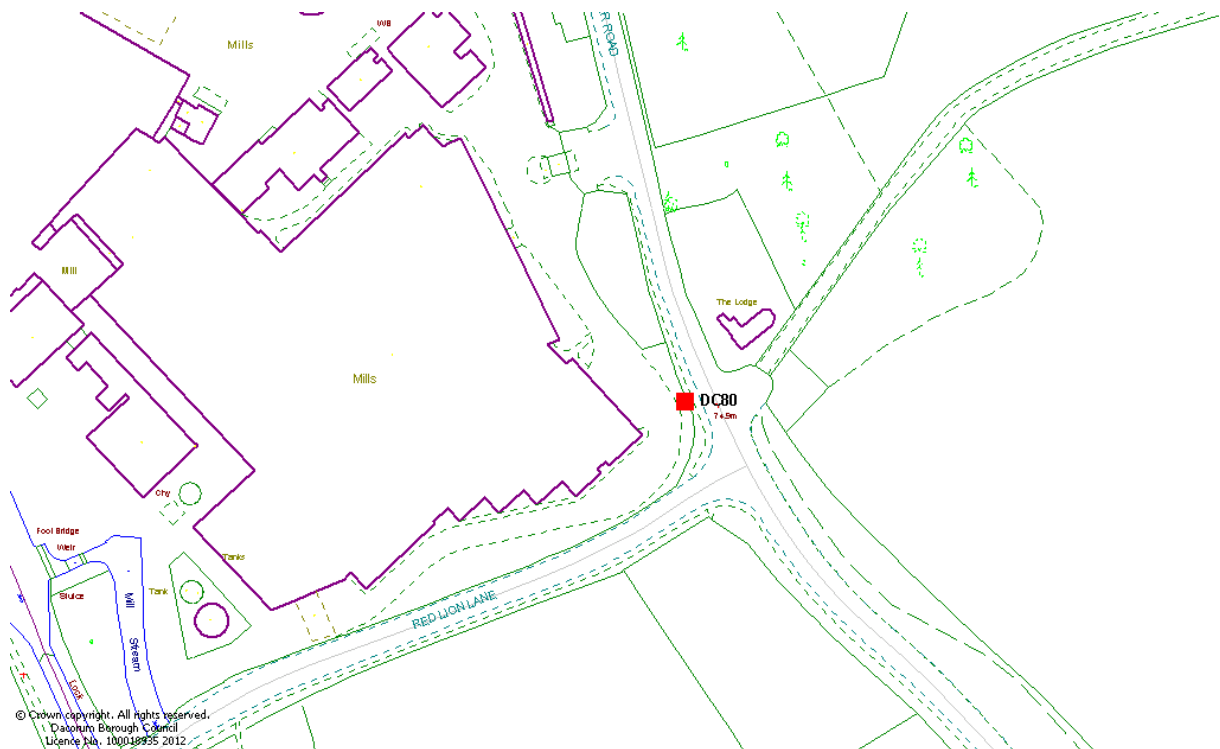
DC78 Cotterells 2



DC79 Cotterells 3

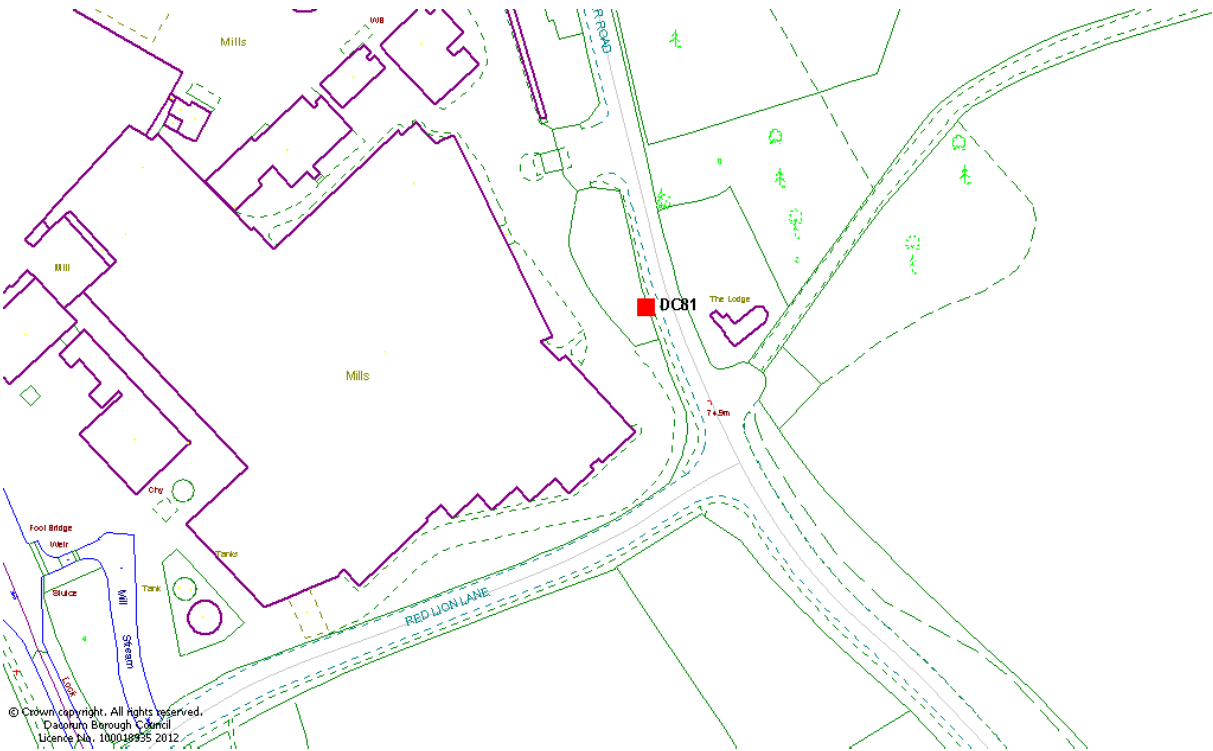


DC80 Sappi 1



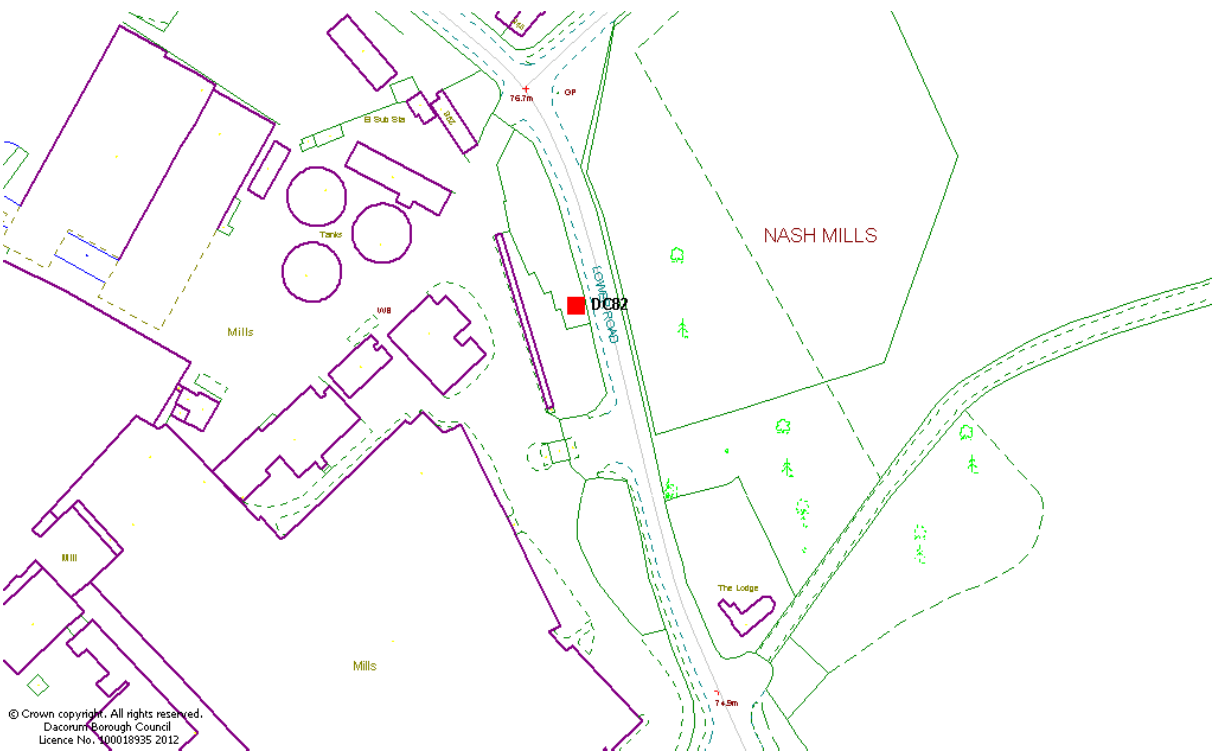
Note: Base map requires updating to reflect redevelopment of former Sappi Graphics site.

DC81 Sappi 2



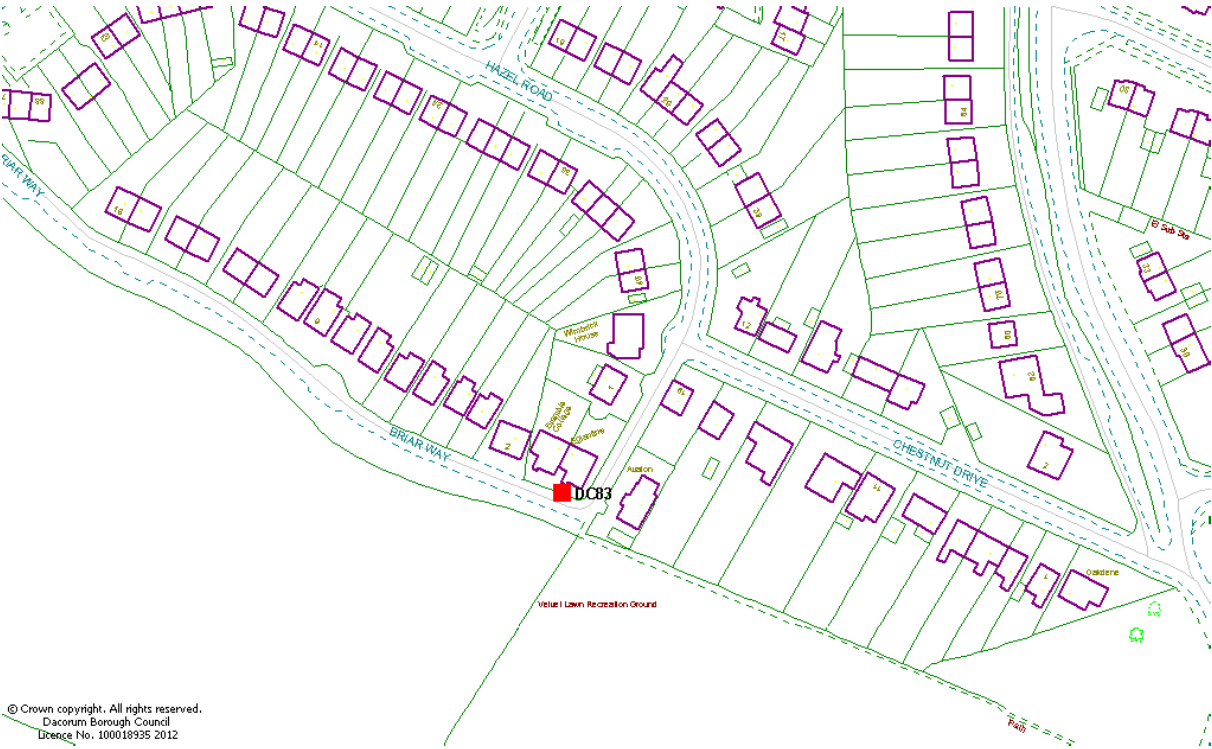
Note: Base map requires updating to reflect redevelopment of former Sappi Graphics site.

DC82 Sappi 3

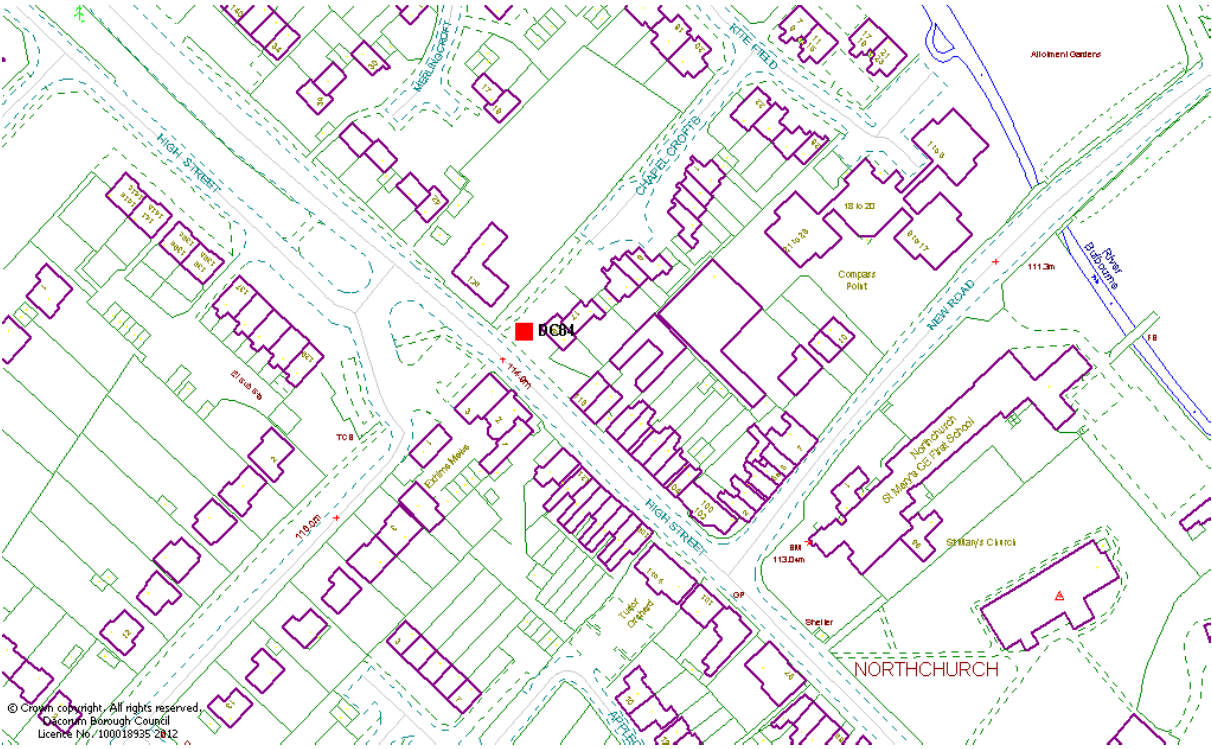


Note: Base map requires updating to reflect redevelopment of former Sappi Graphics site.

DC83 Briar Way



DC84 AQ Machine



DC85 Health Centre, London Road

