



**Chelmsford**  
City Council

## Air Quality Monitoring Plan

May, 2022

Local Authority Officer	Tim Savage
Department	Public Health & Protection Services
Address	Duke Street, Chelmsford Essex CM1 1JE
Telephone	01245 606264
E-mail	<a href="mailto:tim.savage@chelmsford.gov.uk">tim.savage@chelmsford.gov.uk</a>
Date	18th May, 2022
Written by	Tim Savage
Scientific Team Public Health & Protection Services Chelmsford City Council Duke Street Chelmsford Essex CM1 1JE	 <b>Chelmsford</b> City Council

## Table of Contents

### Contents

<b>Local Air Quality Management (LAQM)</b>	<b>1</b>
<b>Continuous Automatic Air Quality Monitoring</b>	<b>2</b>
Servicing, Maintenance and Calibrations	3
Data Collection	5
Data Ratification	5
PM10 and PM2.5 Monitoring Adjustment	6
Automatic Monitoring Data Annualisation	6
Use of Ratified Air Quality Data	6
<b>Diffusion Tube Monitoring</b>	<b>7</b>
Diffusion Tube Procurement	7
Recent AIR PT Results	Error! Bookmark not defined.
Diffusion Tube Monitoring Sites	7
Diffusion Tube Exposure	8
Erroneous Data	9
Diffusion Tube Data Annualisation	9
Diffusion Tube Bias Adjustment	9
NO2 Fall-off with Distance from the Road	10
Use of Ratified Air Quality Data	10
<b>Appendix A: Air Quality Monitoring Sites</b>	<b>11</b>
<b>Appendix B: Maps of Monitoring Locations and AQMAs</b>	<b>17</b>
<b>Appendix E: Summary of Air Quality Objectives in England</b>	<b>32</b>
<b>Glossary of Terms</b>	<b>33</b>
<b>References</b>	<b>34</b>

## Figures

Figure 1 – Chignal St James Air Quality Monitoring Station

Figure 2 - Springfield Road Air Quality Monitoring Station

Figure 3 – Rainsford Lane Monitoring Station

Figure 4 – Baddow Road Monitoring Station

Figure 5 – Example of a Diffusion Tube Installed on the Façade of a Residential Dwelling

Figure 2 – Example of Latest Generation of Air Quality Sensor

Figure B.1 – Monitoring Location Map: Army & Navy AQMA

Figure B.2 – Monitoring Location Map: Chignal St James

Figure B.3 – Monitoring Location Map: A414 Maldon Road, Danbury AQMA

Figure B.4 – Monitoring Location Map: A414 Main Road, Danbury

Figure B.5 – Monitoring Location Map: A414 Maldon Road, Danbury

Figure B.6 – Monitoring Location Map: Springfield Road

Figure B.7 – Monitoring Location Map: Victoria Road

Figure B.8 – Monitoring Location Map: Chelmsford Bus Station

Figure B.9 – Monitoring Location Map: Woodham Ferrers & South Woodham Ferrers

Figure B.10 – Monitoring Location Map: West Chelmsford

Figure B.11 – Monitoring Location Map: Broomfield Road

Figure B.12 – Monitoring Location Map: Wood Street

Figure B.13 – Monitoring Location Map: Waterhouse Lane

Figure B.14 – Monitoring Location Map: Ford End

Figure B.15 – Monitoring Location Map: Howe Green

## Tables

Table 1 – Recent Air PT Results

Table 2 – Bias Adjustment Factor

Table A.1 – Details of Automatic Monitoring Sites

Table A.2 – Details of 2022 Non-Automatic Monitoring Sites

Table C.1 – Air Quality Objectives in England

## Local Air Quality Management (LAQM)

The Local Air Quality Management (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 an exceedance is considered likely the local authority must 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.

We operate a large air quality monitoring network consisting of four air quality monitoring stations and diffusion tubes deployed at more than forty sites. Monitoring locations are located in Air Quality Management Areas (AQMA) and known air pollution hotspots, alongside busy roads, at junctions where significant queuing occurs and at background locations not influenced by road traffic.

The air quality monitoring data is the core of the Council's Annual Status Report (ASR) that is an annual submission to Defra setting out air quality within Chelmsford monitored across the previous year.

Accurate air quality data is important to ensure that the Council undertakes its statutory duty for managing local air quality and to inform the decision-making process for planning and development.

The three pollutants that are at the core of LAQM are nitrogen dioxide (NO<sub>2</sub>), particulate matter (PM<sub>10</sub>) and sulphur dioxide (SO<sub>2</sub>). In order to comply with the statutory duty to review air quality, local authorities undertake air quality monitoring programmes.

In Chelmsford, air quality monitoring has been undertaken since 2000 when diffusion tube monitoring commenced at roads around the Army and Navy roundabout measuring nitrogen dioxide.

Chelmsford City Council operates a wide network of air quality monitoring sites. These sites comprise of continuous automatic monitoring sites and diffusion tube monitoring. Maps and details of these monitoring sites can be found in the appendices.

All monitoring is undertaken in accordance with the LAQM Technical Guidance TG.16.

## Continuous Automatic Air Quality Monitoring

Chelmsford City Council operates a monitoring network with analysers located at four sites. The network primarily monitors nitrogen dioxide (NO<sub>2</sub>) and particles (PM<sub>10</sub> and PM<sub>2.5</sub>) however ozone (O<sub>3</sub>) is monitored at the background site. The network primarily exists to provide essential monitoring data for the LAQM process and air quality objectives, ensuring that pollutants are measured at sites where both road transport is significant and relevant exposure is experienced.

The Chignal St James site is at a location where emissions are minimal and provides background concentrations. The Springfield Road, Rainsford Lane and Baddow Road monitoring sites are at the roadside.

### CM1 Chignal St James

- Nitrogen Dioxide (NO<sub>2</sub>)
- Particulate Matter (PM<sub>10</sub>)

### CM2 Springfield Road

- Nitrogen Dioxide (NO<sub>2</sub>)
- Particulate Matter (PM<sub>10</sub>)
- Particulate Matter (PM<sub>2.5</sub>)

### CM3 Rainsford Lane

- Nitrogen Dioxide (NO<sub>2</sub>)
- Particulate Matter (PM<sub>10</sub>)

### CM4 Baddow Road

- Nitrogen Dioxide (NO<sub>2</sub>)

Details of the automatic monitoring sites can be found in Appendix A.

**Figure 1 – Chignal St James Air Quality Monitoring Station**



**Figure 2 – Springfield Road Air Quality Monitoring Station**





**Figure 3 – Rainsford Lane Air Quality Monitoring Station**



**Figure 4 – Baddow Road Air Quality Monitoring Station**





## Servicing, Maintenance and Calibrations

To ensure optimum data quality and capture, a system of calibration and analyser test procedures is employed. The major components of this system are briefly described below:

- Six monthly service calibrations. After service, the internal slope and offset of the analyser will be set so that the results of the post service calibration will reflect zero and the reference gas at span.
- Fortnightly local site operator (LSO) manual calibrations – The results of these calibrations are used to scale raw pollution data into meaningful concentration units. Instrument drifts are fully quantified by calibrating analysers manually with documented and traceable calibration standards. These calibrations are carried out on a fortnightly basis.
- Daily automatic IZS (Internal Zero & Span) checks - These allow instrumental drifts to be examined, and act as a check on instrument performance. Results should not be used for data scaling but for reference. Note the Span function is not enabled
- Particulate monitors have their filter tapes changed approximately every two months. All automatic monitoring sites are co-located with triplicate NO<sub>2</sub> diffusion tubes.

## Data Collection

Data from these sites is collected by a contractor. Daily data validation checks are made to ensure the analysers are working correctly and to identify any abnormal readings that may occur. Monitoring data is forwarded to the Council.

## Data Ratification

Data ratification is undertaken by the Councils contractor and contains the following processes;

- Applying the scaling factors derived from calibrations, maintenance visits and servicing and checking for equipment drift with adjustments made where detected
- Comparison with datasets from other appropriate Essex Air monitoring sites
- Checking for and deletion of erroneous data that can be linked to analyser fault or failure.
- Live and historic data is available online at <https://www.wecare4air.co.uk/>
- Live data is to be made available on the Love Your Chelmsford website at

## PM10 and PM2.5 Monitoring Adjustment

For the monitoring of particulate matter, Chelmsford City Council uses Met One Beta Attenuation Monitors (BAMs).

- The Met One PM<sub>10</sub> monitors are unheated and require a correction for slope by dividing the raw data by 1.2.
- The Met One PM<sub>2.5</sub> monitor has a smart heater and does not require correction for slope and/or intercept.

## Automatic Monitoring Data Annualisation

If the valid data capture for a monitoring site is below 75% then the data is adjusted using the annualisation process.

Annualisation is the process of estimating annual means from the extrapolation of short-term monitoring results. The methodology consists of using concentration data from nearby continuous monitoring sites to assist in estimating annual mean concentrations at the site.

The continuous monitoring sites used for comparison, will be background (Urban Background, Suburban or Rural) sites to avoid any very local effects that may occur at Urban Centre, Industrial, Roadside or Kerbside sites.

The following nearby background automatic monitoring sites are used in the annualisation process:

- Chignal St James (Local Authority rural background site)
- St Osyth (AURN rural background site)
- Rochester (AURN rural background site)
- Southend (AURN urban background site)

## Use of Ratified Air Quality Data

Measurements and trends from these locations are detailed in the annual LAQM report to Defra and can provide the Council with information for establishing policy relating to air quality management areas and informing planning decisions.

## Diffusion Tube Monitoring

### Diffusion Tube Monitoring Sites

The diffusion tube monitoring network comprises:

- historical monitoring sites across rural, urban and roadside locations
- monitoring sites at AQMAs and air pollution hotspots
- monitoring sites in locations where requests have been received City councillors

**Figure 5 – Example of a Diffusion Tube Installed on the Façade of a Residential Dwelling**



### Diffusion Tube Procurement

Every three years Essex Air undertakes an exercise to assess the differing laboratory options for diffusion tubes. This exercise will assess:

- Recent results from the independent AIR NO<sub>2</sub> proficiency testing scheme.
- Quotation for supply and analysis of diffusion tubes

Currently diffusion tubes are supplied by Socotec (UKAS Testing Laboratory number 1015) with a preparation method of 50% triethanolamine (TEA) in Acetone.

The AIR NO<sub>2</sub> proficiency testing scheme found that the laboratory achieved the following percentage of results determined as satisfactory for 2020:

**Table 3 – Recent Air PT Results**

AIR PT Round	AIR PT AR42
Round conducted in the period	January – March 2021
SOCOTEC	100%

### Diffusion Tube Exposure

Diffusion tube monitoring is undertaken in accordance with the Defra NO<sub>2</sub> diffusion tube monitoring [calendar](#). Diffusion tubes are replaced after approximately one month exposure.

The diffusion tubes are sent away to the laboratory for analysis and upon receipt of monthly diffusion tube results from the laboratory, the data is copied into a spreadsheet. This data is raw and requires adjustment to allow for a valid annual mean concentration to be derived.

## Erroneous Data

Sometimes, a diffusion tube results may be much higher or lower than usual results from the site.

- Very low concentrations are rare at roadside monitoring sites. If such a low concentration is measured where NO<sub>2</sub> concentrations are usually much higher, it may be due to a faulty diffusion tube and removed from the data set
- Very high concentrations are normally left in the data set unless there are specific reasons as to why the diffusion tube might be considered faulty

## Diffusion Tube Data Annualisation

If the valid data capture for a monitoring site is below 75% then the data is adjusted using the annualisation process in the same manner discussed in the automatic monitoring section.

## Diffusion Tube Bias Adjustment

The mean average concentration is calculated from the raw monthly diffusion tube results which have been annualised where required. These results are then corrected for bias.

Bias represents the overall tendency of the diffusion tubes to under or over-read relative to the reference chemiluminescence analyser

Triplicate co-location studies can be used to determine a local bias factor based on the comparison of diffusion tube results with data taken from NO<sub>2</sub> automatic monitoring sites. Alternatively, the national database of diffusion tube co-location surveys provides bias factors for the relevant laboratory and preparation method.

Chelmsford City Council uses the national bias adjustment factor to adjust raw monitoring data. This is to maintain consistency with other Councils in Essex and to exclude issues where poor data capture from the automatic analysers may affect the overall bias adjustment figure.

A summary of bias adjustment factors used by Chelmsford City Council over the past five years is presented in the table below.

**Table 4 – Bias Adjustment Factor**

Year	Local or National	Diffusion Tube	Version of National Spreadsheet	Adjustment Factor
2021	National	Socotec 50% TEA in Acetone		
2020	National	Socotec 50% TEA in Acetone	03/21	0.77
2019	National	Socotec 50% TEA in Acetone	03/20	0.75
2018	National	Socotec 50% TEA in Acetone	03/19	0.76
2017	National	ESG Didcot 50% TEA in Acetone	03/18	0.77
2016	National	ESG Didcot 50% TEA in Acetone	03/17v2	0.77

Defra provides a diffusion tube data processing tool to process NO<sub>2</sub> diffusion tube monitoring data. It allows raw monthly NO<sub>2</sub> diffusion tube raw to undergo a number of processes to derive a valid annual mean concentration.

### **NO<sub>2</sub> Fall-off with Distance from the Road**

Wherever possible, local authorities should ensure that monitoring locations are representative of exposure i.e. on the façade of a residential property. However, this is not always possible and if an exceedance occurs, the NO<sub>2</sub> concentration at the receptor is estimated using the Diffusion Tube Data Processing Tool / NO<sub>2</sub> fall-off with distance calculator available on the LAQM Support website.

Defra provides a diffusion tube data processing tool to process NO<sub>2</sub> diffusion tube monitoring data. It allows raw monthly NO<sub>2</sub> diffusion tube raw to undergo a number of processes to derive a valid annual mean concentration.

### **Use of Ratified Air Quality Data**

Measurements and trends from these locations are detailed in the annual LAQM report to Defra and can provide the Council with information for establishing policy relating to air quality management areas and informing planning decisions.



## Monitoring with Air Quality Sensors

Air quality monitoring is normally undertaken using established protocols of diffusion tubes networks and continuous automatic reference analysers.

However, recent developments in technology have led to low-cost sensors being designed and produced to measure pollutants in ambient air in a similar manner to reference methods but because of their compactness, low power consumption and cost, are able to be sited at a greater density than expensive and complicated reference methods.

Because of their compactness, low power consumption and cost, air quality sensors provide the ability to fill the gap between diffusion tubes and continuous monitoring allowing for high quality measurements to take place at targeted locations.

These locations could be within an AQMA, air pollution hotspot or at a busy junction where the data could be used in conjunction with traffic sensors to build a picture of air quality during periods when traffic congestion increases.

**Figure 6 – Example of Latest Generation of Air Quality Sensor**



Chelmsford City Council will be developing a project plan for the rollout of air quality and traffic sensor nodes across Chelmsford.

## How You Can View Our Air Quality Data

Chelmsford City Councils measured air quality data can be found in the air quality Annual Status Reports that are held on the Essex Air [website](#).

The most recent Annual Status Report can be downloaded from  
[www.chelmsford.gov.uk/resources/assets/attachment/full/0/6402597.pdf](http://www.chelmsford.gov.uk/resources/assets/attachment/full/0/6402597.pdf)

Current continuous automatic analyser data can be downloaded at the We Care 4 Air website <https://www.wecare4air.co.uk/>

Diffusion tube data and automatic data is available from  
<https://forms.chelmsford.gov.uk/contactus-publichealth/>

Air quality data is also available by request:

Civic Centre, Duke Street, Chelmsford. CM1 1JE

01245 606606 (ask for public health)

[www.chelmsford.gov.uk/your-council/contacting-us/contacting-us-online/](http://www.chelmsford.gov.uk/your-council/contacting-us/contacting-us-online/)

[www.chelmsford.gov.uk/environmental-and-public-health/](http://www.chelmsford.gov.uk/environmental-and-public-health/)

## Appendix A: Air Quality Monitoring Sites

**Table A.3 – Details of Automatic Monitoring Sites**

Site ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Monitoring Technique	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Inlet Height (m)
CM1	Chignal St James	Rural	566463	210830	NO, NOx, NO2, PM10, O3	NO	Chemiluminescent / Unheated BAM / UV Photometry	40	43	4
CM2	Springfield Road (Prison)	Roadside	571640	207179	NO, NOx, NO2, PM10, PM2.5	NO	Chemiluminescent / Unheated BAM / Heated BAM	29.2	2.8	2.5
CM3	Rainsford Lane (Fire Station)	Roadside	569912	206881	NO, NOx, NO2, PM10	NO	Chemiluminescent / Unheated BAM	20	2.5	2.5
CM4	Baddow Road	Roadside	571654	205798	NO, NOx, NO2	NO	Chemiluminescent	12	5.1	1.5

**Notes:**

(1) 0m if the monitoring site is at a location of exposure (e.g. installed on the façade of a residential property).

(2) N/A if not applicable

Table A.4 – Details of 2022 Non-Automatic Monitoring Sites

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m)	Distance to Kerb of Nearest Road (m)	Tube Co-located with a Continuous Analyser	Height (m)
CB01	12 Van Diemens Road	Roadside	571421	205963	NO <sub>2</sub>	Yes Army & Navy AQMA	0.0	12.0	No	2.5
CB02	3 Moulsham Chase	Roadside	571388	205725	NO <sub>2</sub>	No	9.3	2.5	No	2.5
CB13	60 Roxwell Road	Roadside	569077	207528	NO <sub>2</sub>	No	0.0	16.0	No	2.5
CB22, CB22B, CB22C	95 Baddow Road	Roadside	571505	205968	NO <sub>2</sub>	Yes Army & Navy AQMA	0.0	8.0	No	2.5
CB26, CB26B, CB26C	214 Baddow Road	Roadside	571614	205812	NO <sub>2</sub>	No	0.0	5.0	No	2.5
CB27	Howe Green Interchange	Roadside	574080	203469	NO <sub>2</sub>	No	0.0	18.0	No	2.5
CB32	2 Abbots Place	Roadside	571581	207144	NO <sub>2</sub>	No	0.0	5.0	No	2.5
CB33	Victoria Road	Roadside	570974	207157	NO <sub>2</sub>	No	3.0	3.0	No	2.5
CB36	2 Rainsford Lane	Roadside	570104	207247	NO <sub>2</sub>	No	2.0	1.0	No	2.5
CB38, CB39, CB40	Prison 3	Roadside	571640	207179	NO <sub>2</sub>	No	14.0	3.0	Yes	2.5
CB46	32 Rochford Road	Roadside	571062	206281	NO <sub>2</sub>	Yes Army & Navy AQMA	2.0	3.0	No	2.5
CB49	26 Rochford Road	Roadside	571104	206262	NO <sub>2</sub>	Yes Army & Navy AQMA	0.0	5.0	No	2.5
CB52	Penpol, Victoria Road	Roadside	571367	207014	NO <sub>2</sub>	No	0.0	3.0	No	2.5
CB57	Goldlay House, Parkway	Roadside	571359	206124	NO <sub>2</sub>	No	0.0	16.0	No	2.5
CB58	148 Baddow Road	Roadside	571476	205964	NO <sub>2</sub>	Yes Army & Navy AQMA	0.0	12.0	No	2.5
CB61	10 Fraser Close	Urban Background	571445	205631	NO <sub>2</sub>	No	0.0	7.0	No	2.5
CB62, CB63, CB64	Chignal 3	Rural	566463	210830	NO <sub>2</sub>	No	40.0	43.0	Yes	4.0
CB65, CB66, CB67	Fire Station 3	Roadside	569912	206881	NO <sub>2</sub>	No	20.0	2.5	Yes	2.5
CB68, CB68B, CB68C	Goldlay Avenue 3	Roadside	571382	206092	NO <sub>2</sub>	No	0.0	12.0	No	2.5

CB76, CB76B, CB76C	5/7 Maldon Road, Danbury	Roadside	578506	205122	NO <sub>2</sub>	Yes Danbury AQMA	0.0	1.0	No	2.5
CB79	10 Waterhouse Lane	Roadside	569480.455	206009.327	NO <sub>2</sub>	No	2.0	1.0	No	2.5
CB82	122 Springfield Road	Roadside	571438	206966	NO <sub>2</sub>	No	0.0	4.0	No	2.5
CB83	134/136 Springfield Road	Roadside	571462	206999	NO <sub>2</sub>	No	0.0	3.0	No	2.5
CB84, CB85, CB86	Baddow Road AQMS 3	Roadside	571653	205800	NO <sub>2</sub>	No	12.0	5.1	Yes	1.0
CB87	Bus Station	Urban Centre	570444	207044	NO <sub>2</sub>	No	4.0	3.0	No	2.5
CB89	135 Springfield Road	Kerbside	571426	206979	NO <sub>2</sub>	No	2.0	0.5	No	2.5
CB90	144 Springfield Road	Roadside	571480	207019	NO <sub>2</sub>	No	2.0	2.0	No	2.5
CB91, CB92, CB93	26 Maldon Road, Danbury	Roadside	578539	205113	NO <sub>2</sub>	Yes Danbury AQMA	0.0	1.0	No	2.5
CB94	Copt Hill, Danbury	Roadside	578571	205108	NO <sub>2</sub>	Yes Danbury AQMA	-1.4	2.8	No	2.5
CB95	Eves Corner, Danbury	Roadside	578415	205106	NO <sub>2</sub>	Yes Danbury AQMA	3.0	2.0	No	2.5
CB96	Heathcote School, Main Road, Danbury	Kerbside	578359	205120	NO <sub>2</sub>	No	3.0	0.3	No	2.5
CB98A, CB98B, CB98C	Rear of 66 Baddow Road (Dentists)	Roadside	571148	206324	NO <sub>2</sub>	Yes	2.0	3.0	No	2.5
CB99A, CB99B, CB99C	Rear of 74 Baddow Road (Aga Shop)	Roadside	571211	206274	NO <sub>2</sub>	Yes	3.4	1.3	No	2.5
CB102	Maldon Road Junction w/ The Avenue, Danbury	Roadside	578954.31	205131.82	NO <sub>2</sub>	No	1.0	1.0	No	2.5
CB103A, CB103B, CB103C	Opposite Myra Cottage Maldon Road, Danbury	Roadside	578476.76	205110.58	NO <sub>2</sub>	Yes Danbury AQMA	8.0	1.0	No	2.5
CB104	Main Road Danbury	Roadside	577583	205360	NO <sub>2</sub>	No	2.0	2.0	No	2.5
CB107	Opposite 28 Wood Street	Roadside	569976.94	205233.94	NO <sub>2</sub>	No	N/A	1.0	No	2.5
CB108	Blacksmiths Cottage, Maldon Road, Danbury	Urban Background	578487.544	205139.213	NO <sub>2</sub>	No	0.0	19.0	No	2.5
CB109	Adjacent to Anytime Fitness, Viaduct Road	Roadside	570456.126	207024.951	NO <sub>2</sub>	No	0.0	1.0	No	2.5
CB110A, CB110B, CB110C	Adjacent to 25 Wood Street	Roadside	569982.25	205263.95	NO <sub>2</sub>	No	0.0	1.0	No	2.5

CB111A, CB111B, CB111C	Wood Street adjacent to Bruce Grove	Roadside	569996.04	205198.82	NO <sub>2</sub>	No	0.0	1.0	No	2.5
CB112A, CB112B, CB112C	Burnham Road / Greenwood Surgery	Roadside	580275	198121	NO <sub>2</sub>	No	10.8	1.0	No	2.5
CB113	Broomfield Road	Roadside	570659	210483	NO <sub>2</sub>	No	0.0	1.0	No	2.5
CB114	B1008 Ford End	Roadside	567537	216958	NO <sub>2</sub>	No	N/A	1.0	No	2.5
CB115	B1418 Woodham Ferrers	Kerbside	579847	199337	NO <sub>2</sub>	No	0.0	1.0	No	2.5
CB116	Beauchamps Close	Urban Background	572683	209617	NO <sub>2</sub>	No	0.0	11.4	No	2.5
CB117	White Hart Lane adjacent to Centenary Way	Kerbside	572642	209674	NO <sub>2</sub>	No	N/A	1.0	No	2.5

**Notes:**

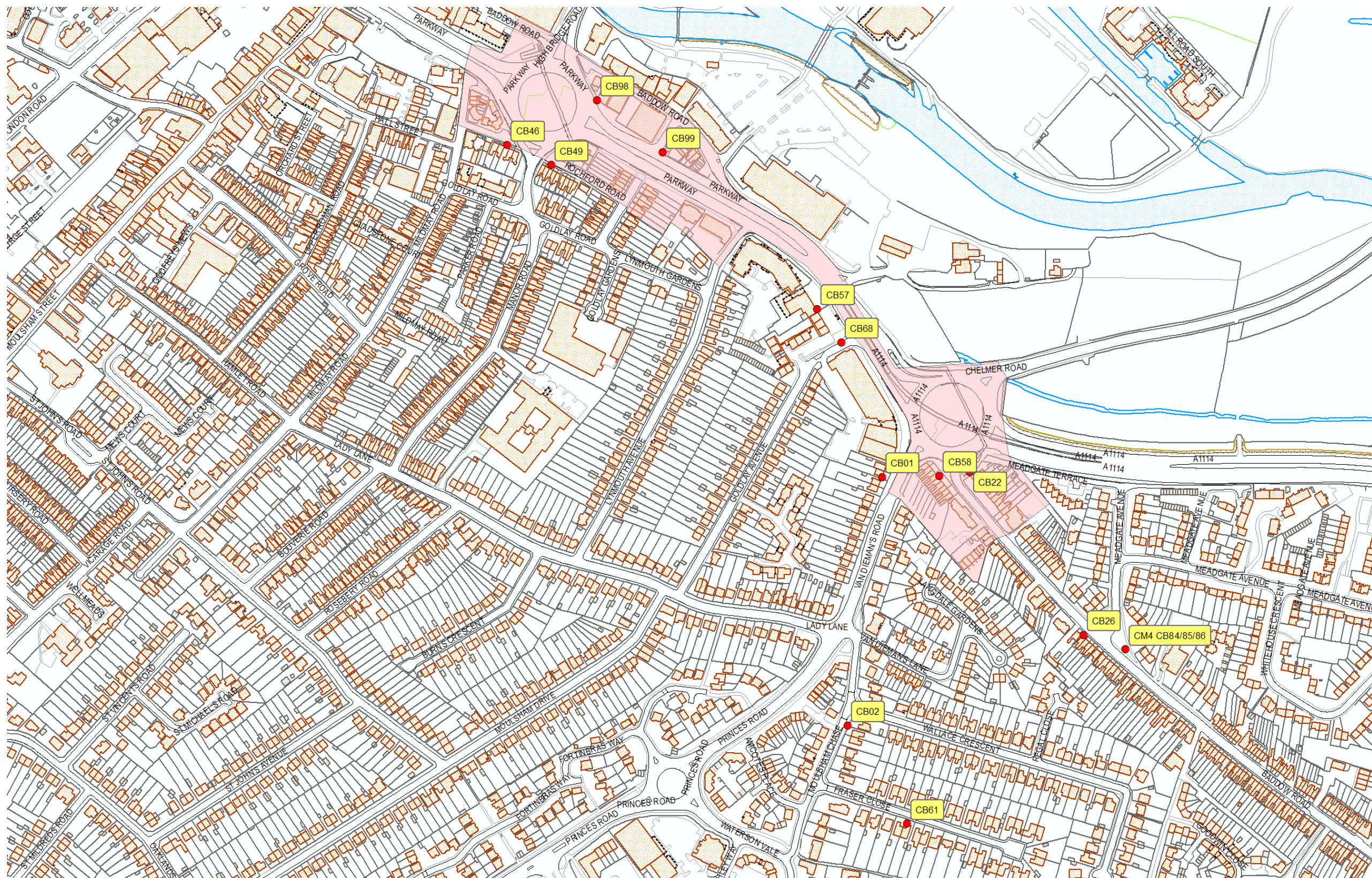
(1) 0m if the monitoring site is at a location of exposure (e.g. installed on the façade of a residential property).

(2) N/A if not applicable.



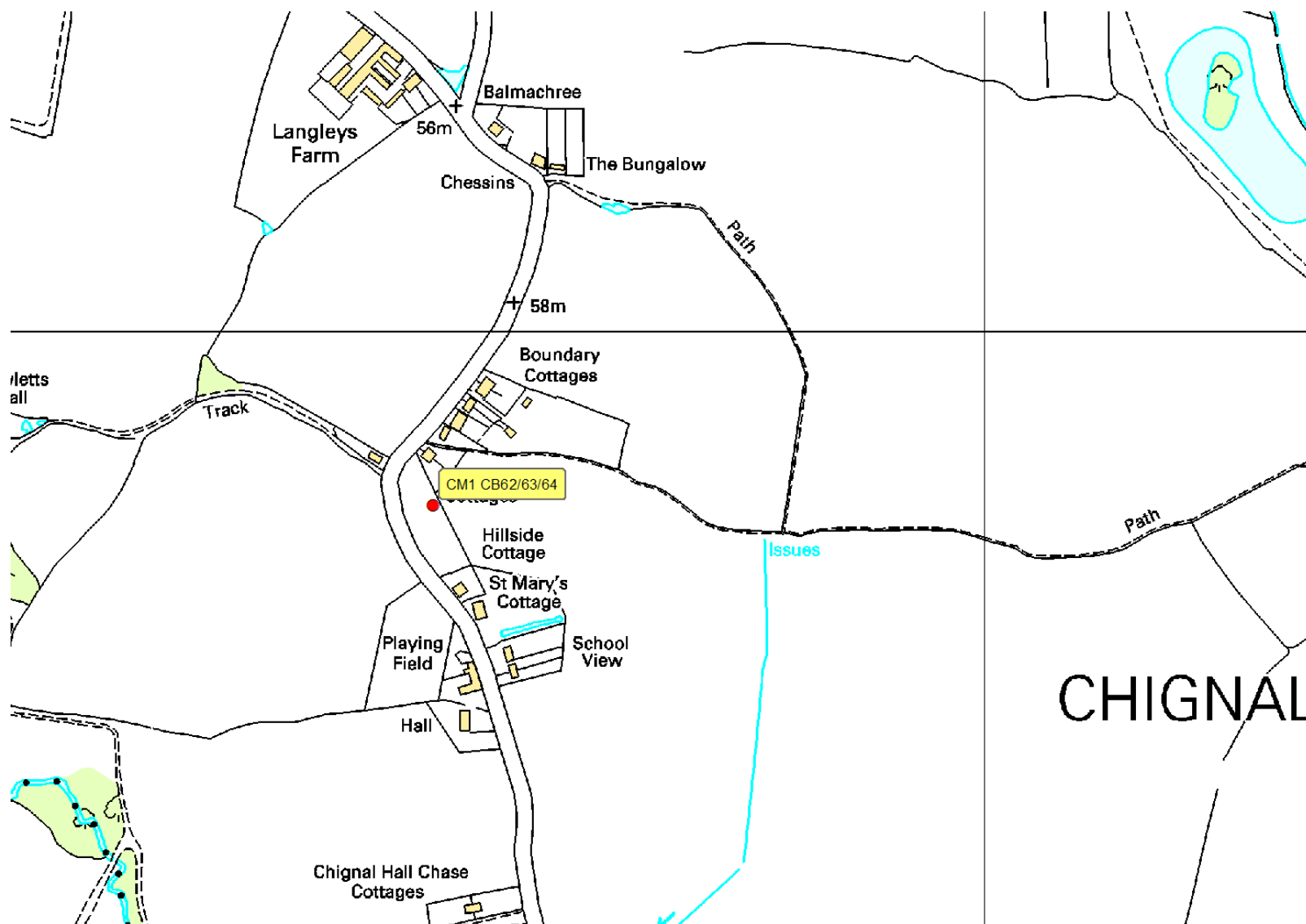
## Appendix B: Maps of Monitoring Locations and AQMAs

Figure B.16 – Monitoring Location Map: Army & Navy AQMA



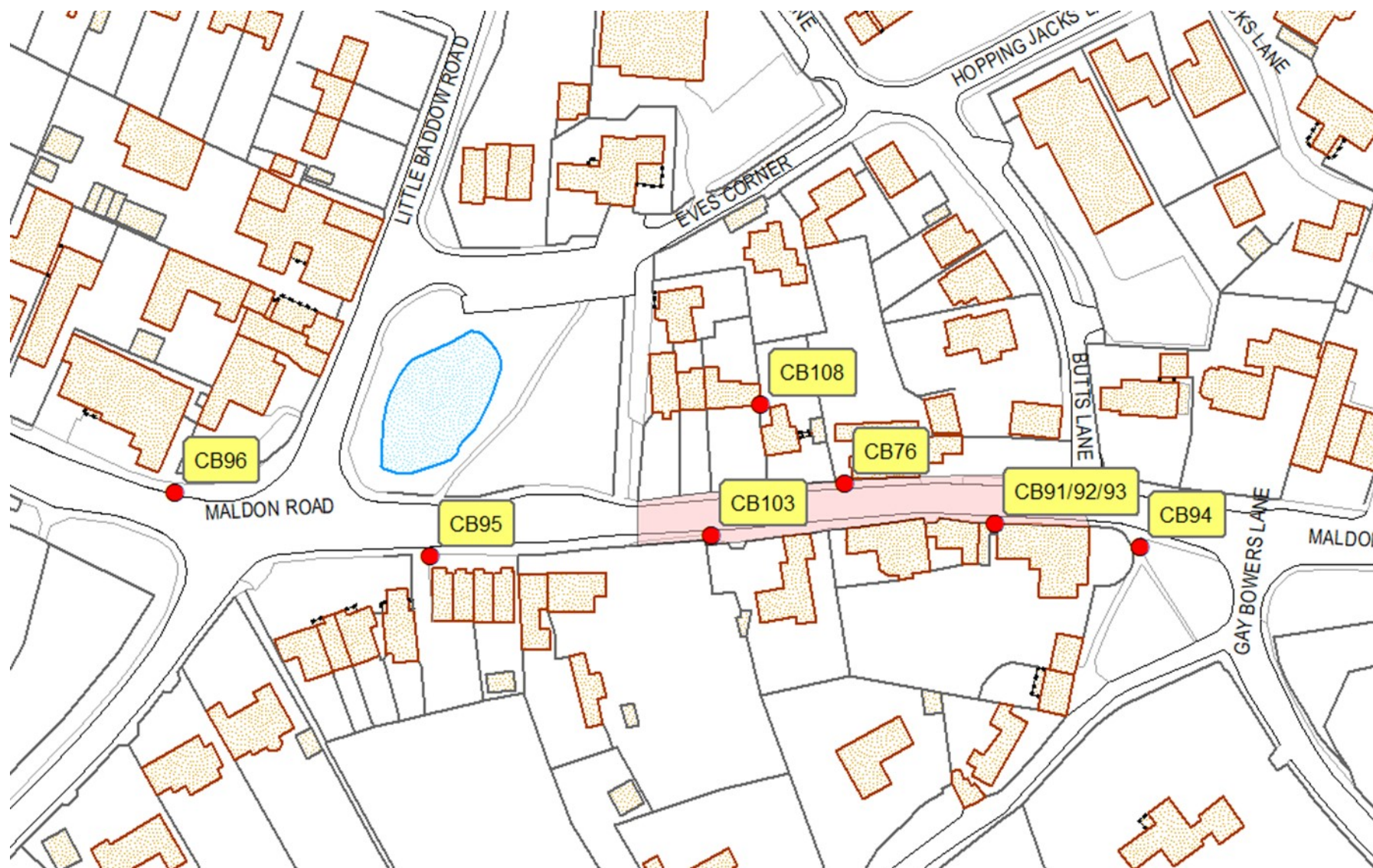


### Figure B.17 – Monitoring Location Map: Chignal St James



Crown copyright and database rights 2022 Ordnance Survey 100023562

Figure B.18 – Monitoring Location Map: A414 Maldon Road, Danbury AQMA



Crown copyright and database rights 2022 Ordnance Survey 100023562

**Figure B.19 – Monitoring Location Map: A414 Main Road, Danbury**



Crown copyright and database rights 2022 Ordnance Survey 100023562

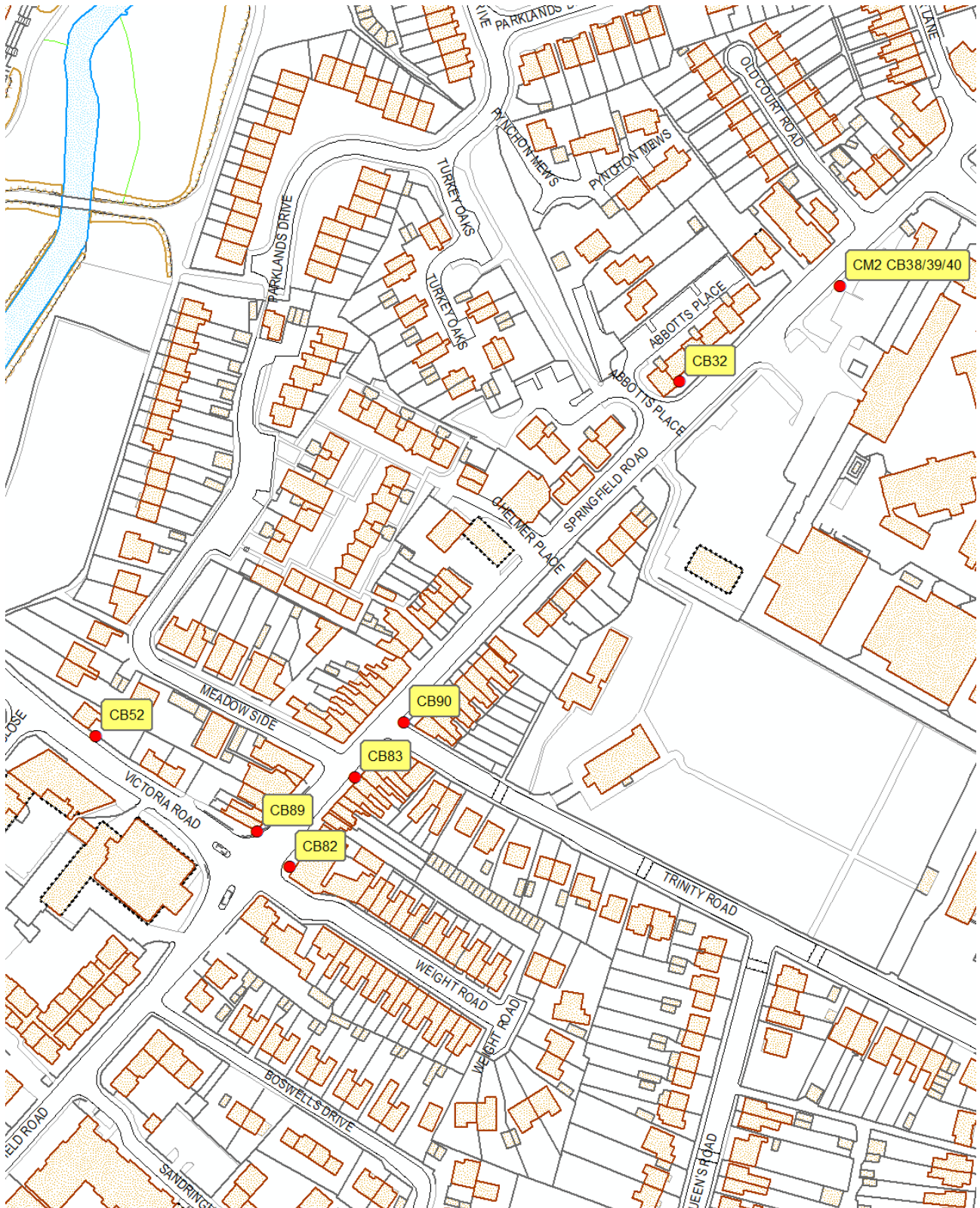


Figure B.20 – Monitoring Location Map: A414 Maldon Road, Danbury



Crown copyright and database rights 2022 Ordnance Survey 100023562

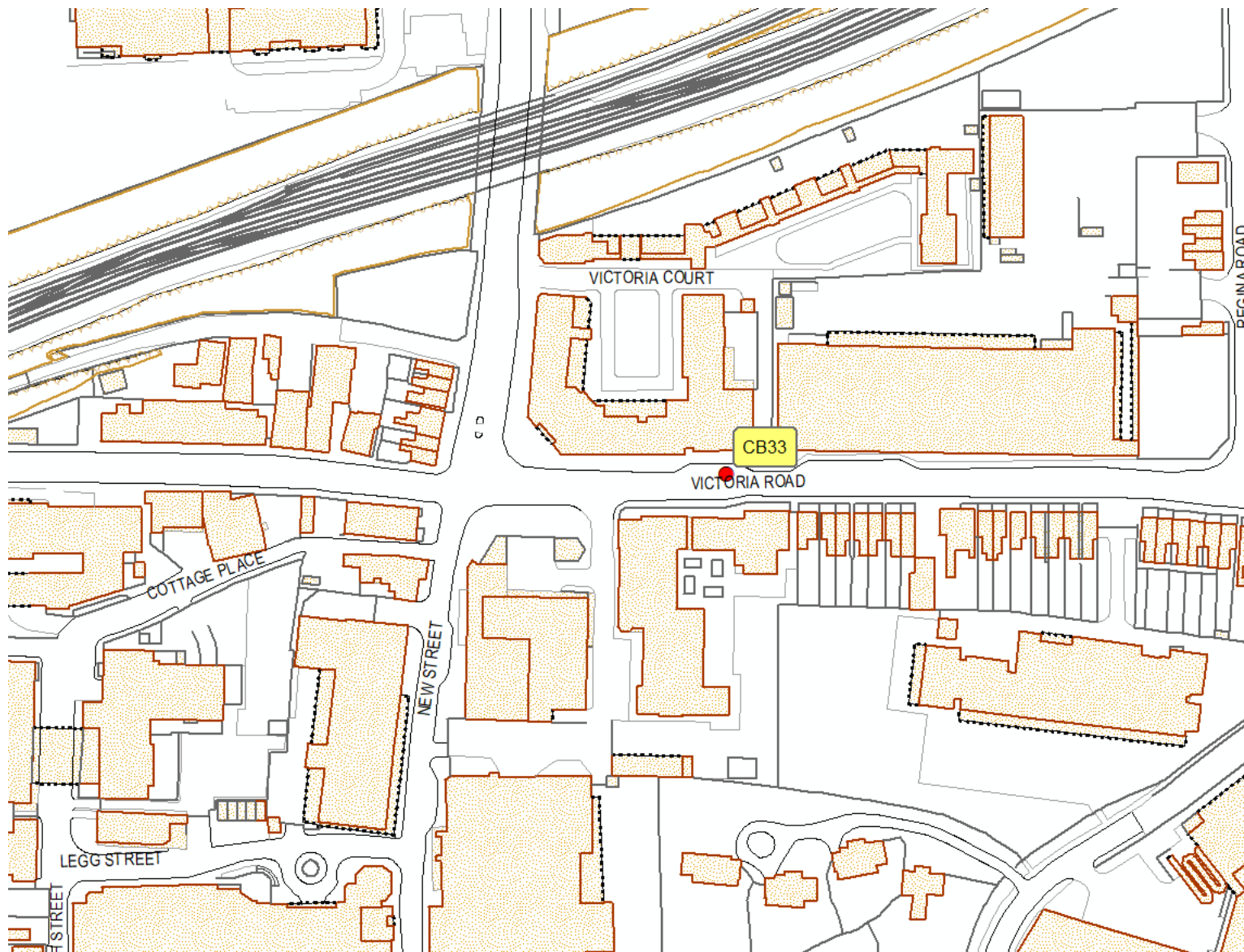
**Figure B.21 – Monitoring Location Map: Springfield Road**



Crown copyright and database rights 2022 Ordnance Survey 100023562

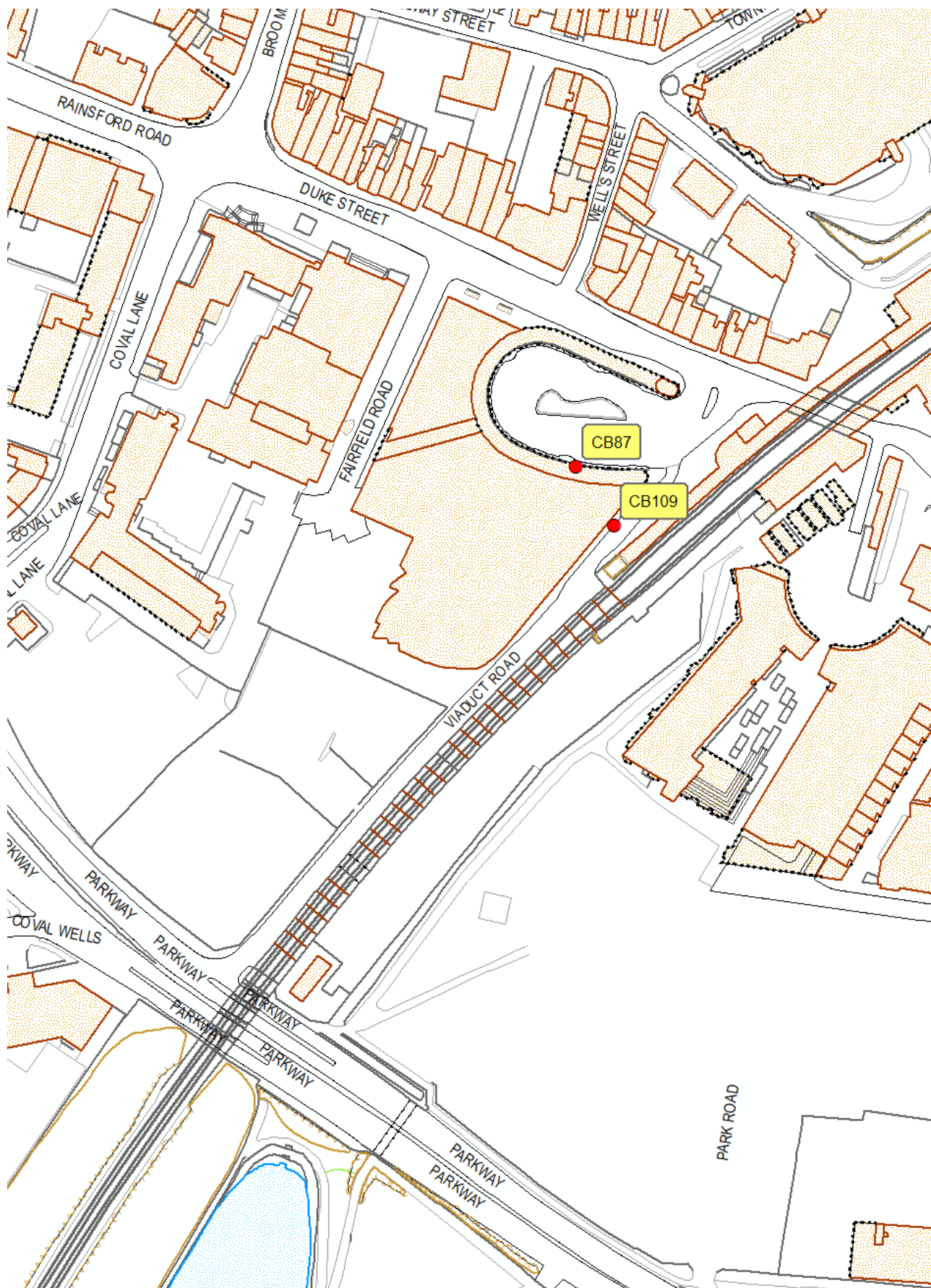


Figure B.22 – Monitoring Location Map: Victoria Road



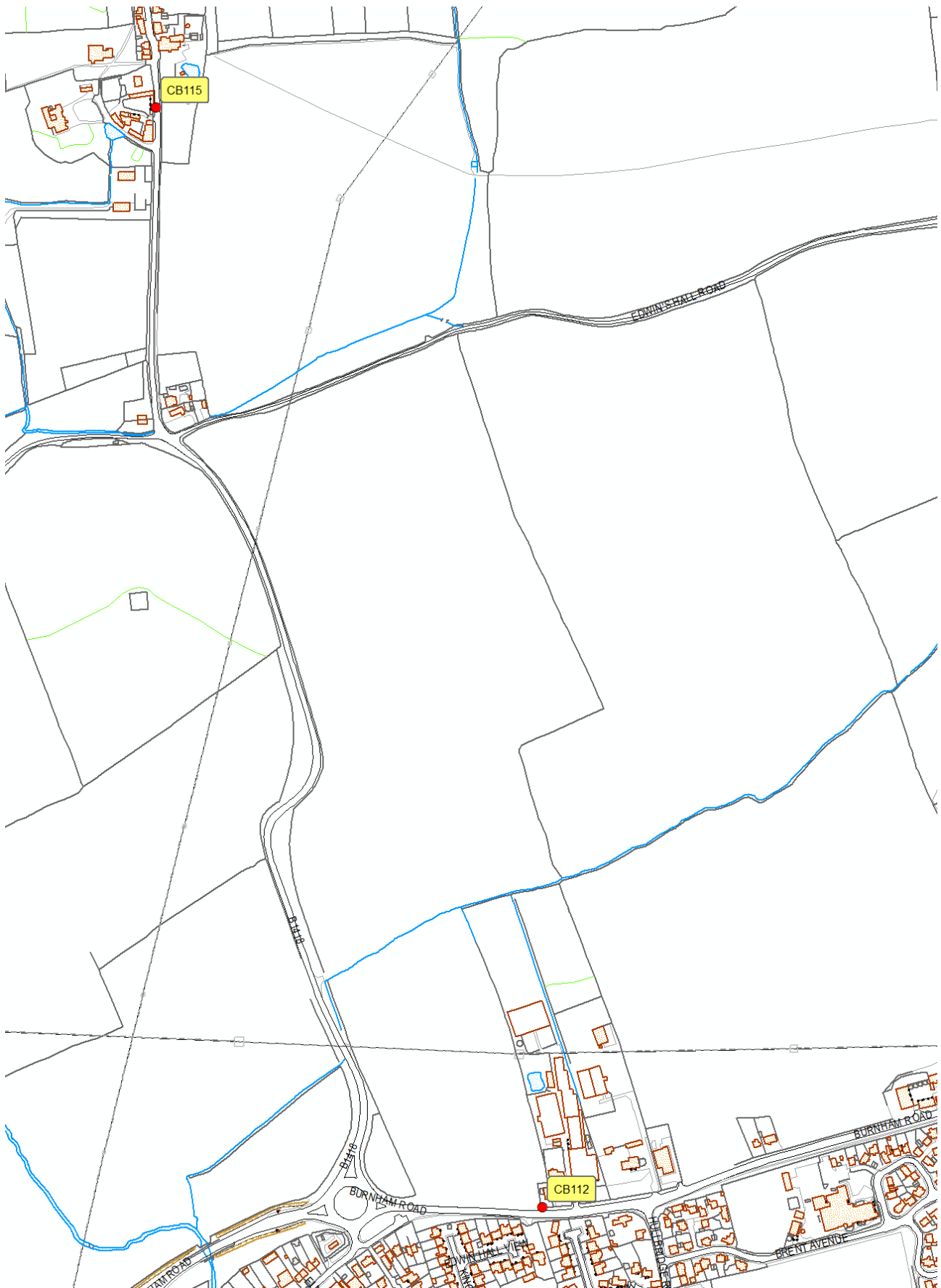
Crown copyright and database rights 2022 Ordnance Survey 100023562

**Figure B.23 – Monitoring Location Map: Chelmsford Bus Station**



Crown copyright and database rights 2022 Ordnance Survey 100023562

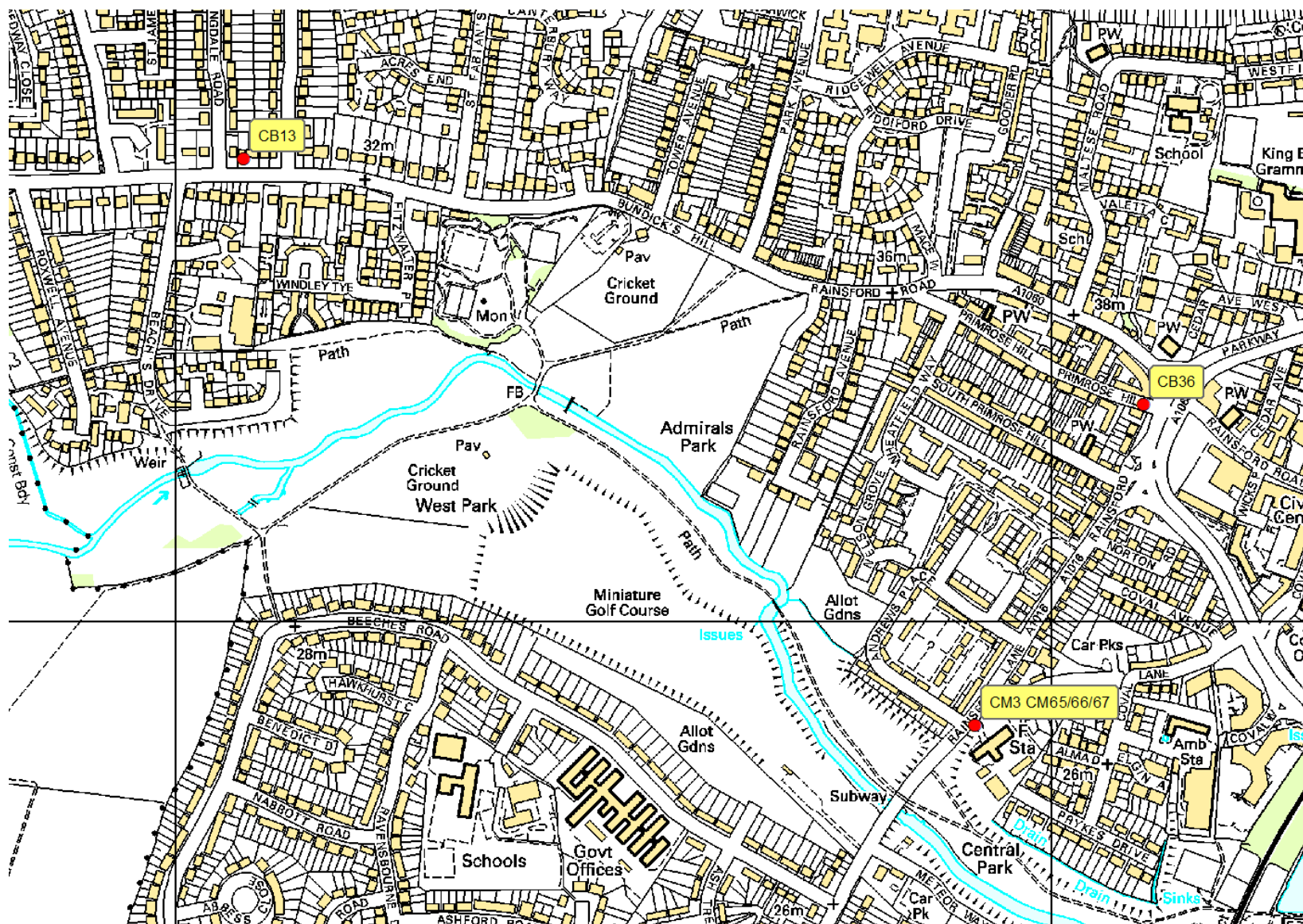
**Figure B.24 – Monitoring Location Map: Woodham Ferrers & South Woodham Ferrers**



DRAFT

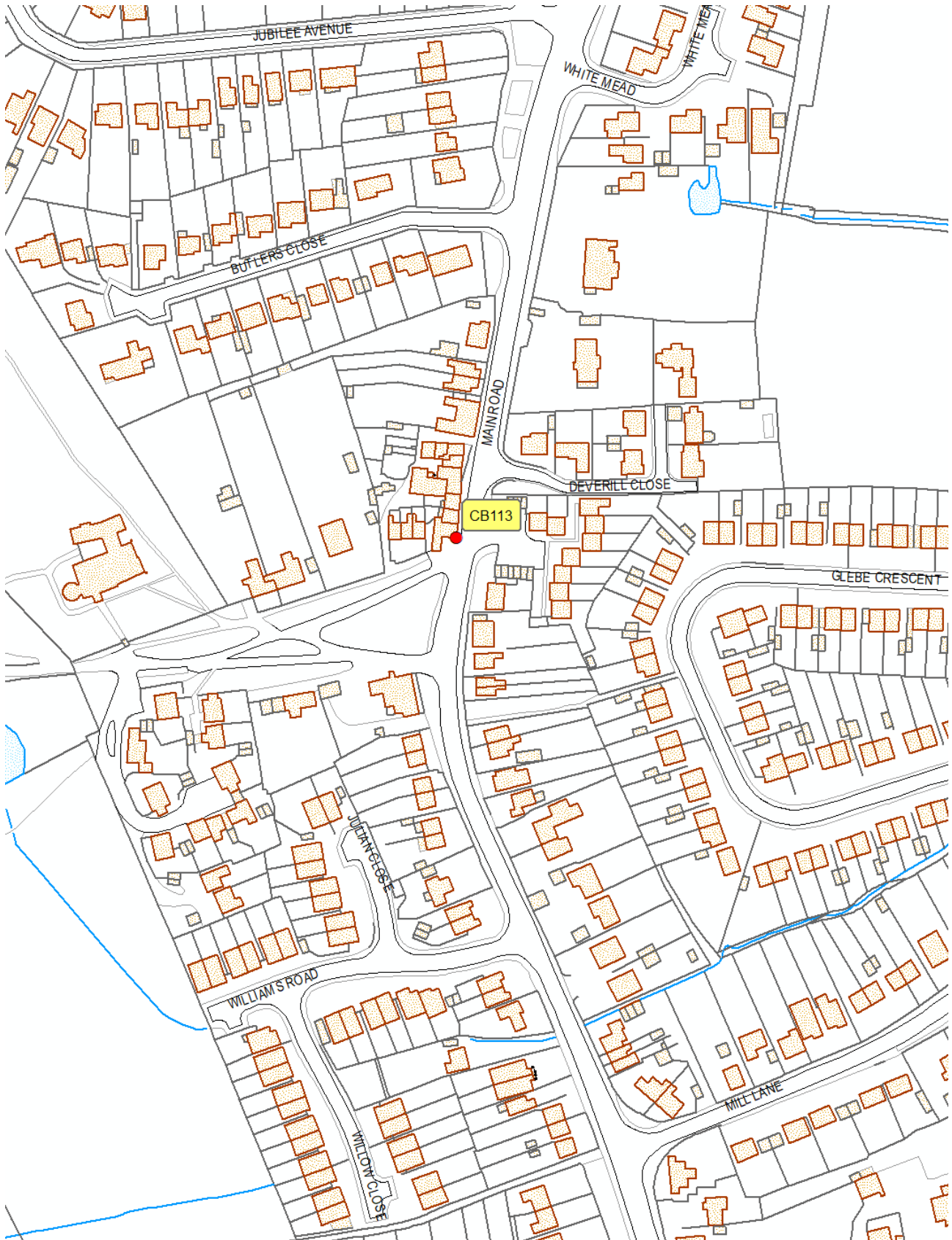


Figure B.25 – Monitoring Location Map: West Chelmsford



Crown copyright and database rights 2022 Ordnance Survey 100023562

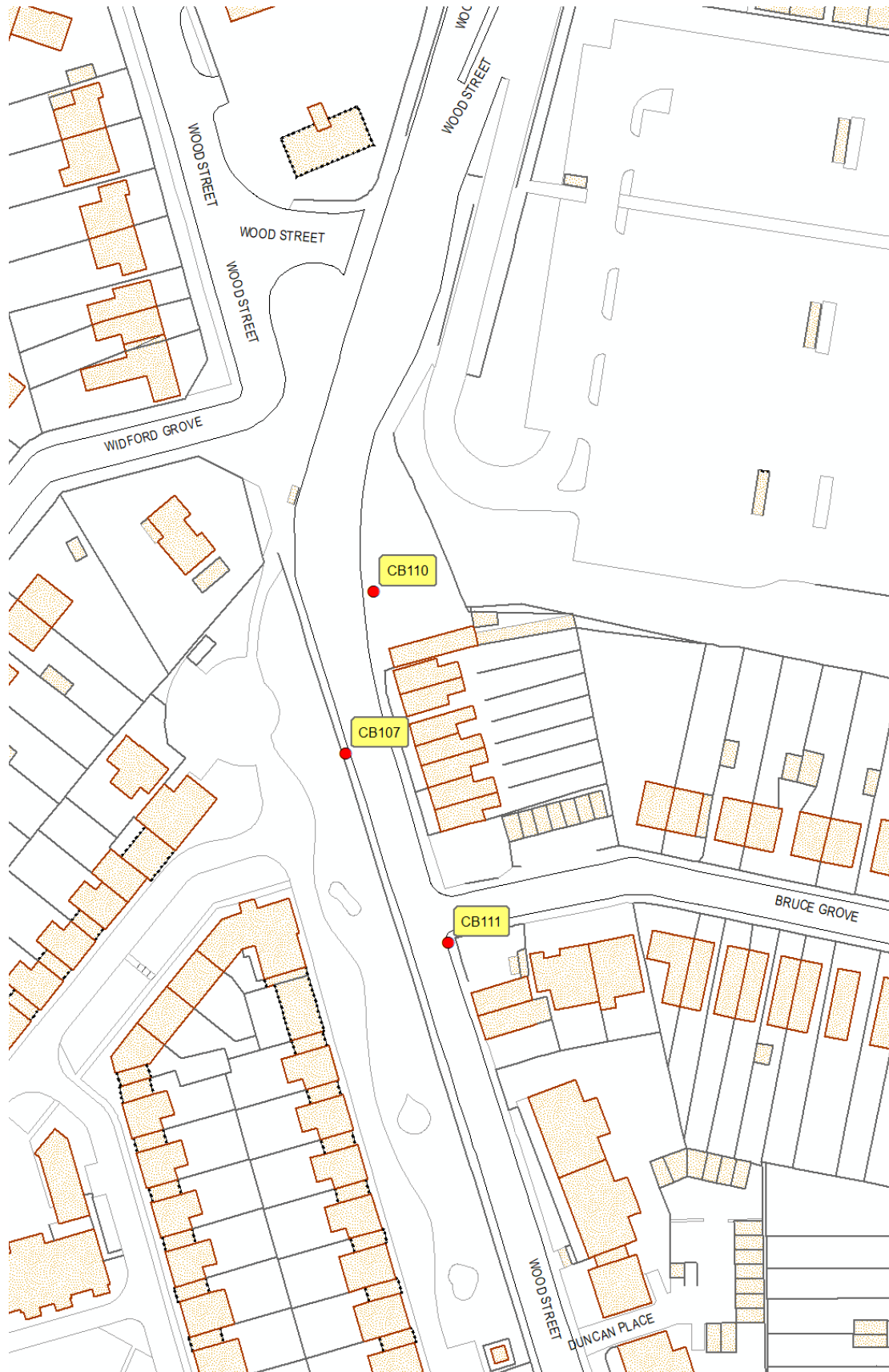
**Figure B.26 – Monitoring Location Map: Broomfield Road**



Crown copyright and database rights 2022 Ordnance Survey 100023562

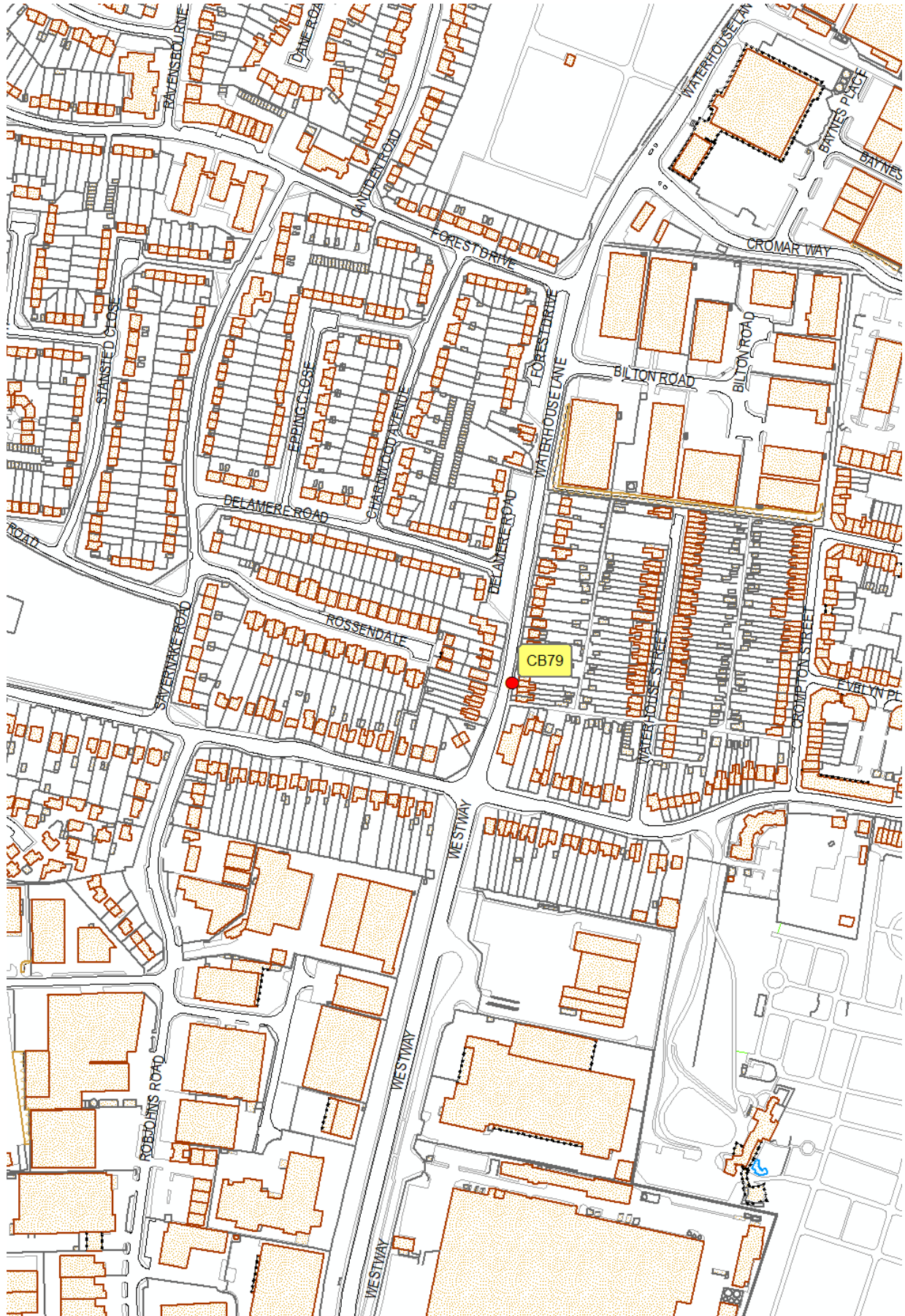


**Figure B.27 – Monitoring Location Map: Wood Street**



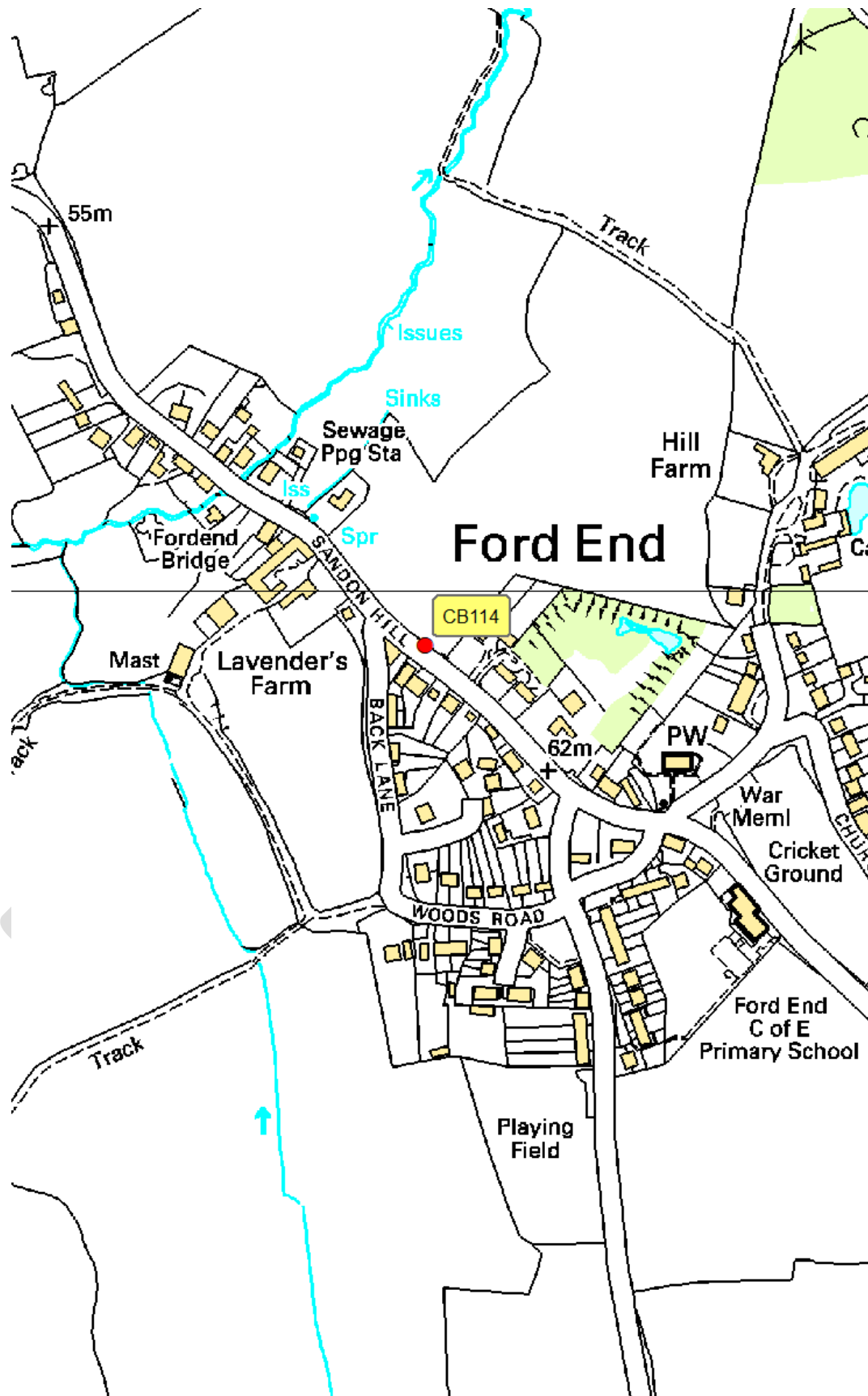
Crown copyright and database rights 2022 Ordnance Survey 100023562

Figure B.28 – Monitoring Location Map: Waterhouse Lane



Crown copyright and database rights 2022 Ordnance Survey 100023562

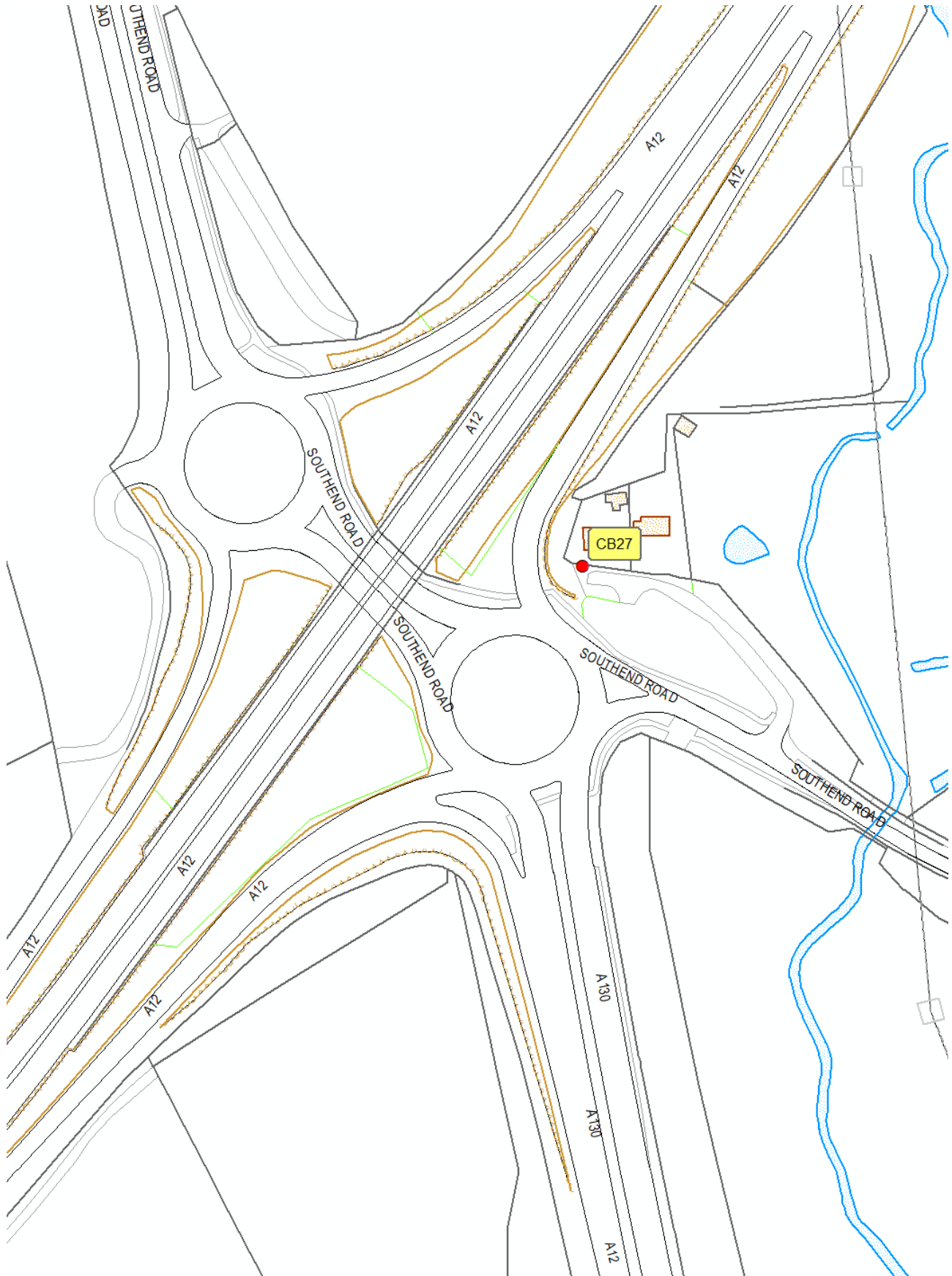
Figure B.29 – Monitoring Location Map: Ford End



Crown copyright and database rights 2022 Ordnance Survey 100023562



**Figure B.30 – Monitoring Location Map: Howe Green**



Crown copyright and database rights 2022 Ordnance Survey 100023562



## Appendix C: Summary of Air Quality Objectives in England

**Table C.2 – Air Quality Objectives in England<sup>1</sup>**

Pollutant	Air Quality Objective: Concentration	Air Quality Objective: Measured as
Nitrogen Dioxide (NO <sub>2</sub> )	200µg/m <sup>3</sup> not to be exceeded more than 18 times a year	1-hour mean
Nitrogen Dioxide (NO <sub>2</sub> )	40µg/m <sup>3</sup>	Annual mean
Particulate Matter (PM <sub>10</sub> )	50µg/m <sup>3</sup> , not to be exceeded more than 35 times a year	24-hour mean
Particulate Matter (PM <sub>10</sub> )	40µg/m <sup>3</sup>	Annual mean
Sulphur Dioxide (SO <sub>2</sub> )	350µg/m <sup>3</sup> , not to be exceeded more than 24 times a year	1-hour mean
Sulphur Dioxide (SO <sub>2</sub> )	125µg/m <sup>3</sup> , not to be exceeded more than 3 times a year	24-hour mean
Sulphur Dioxide (SO <sub>2</sub> )	266µg/m <sup>3</sup> , not to be exceeded more than 35 times a year	15-minute mean

<sup>1</sup> The units are in microgrammes of pollutant per cubic metre of air (µg/m<sup>3</sup>).

## Glossary of Terms

Abbreviation	Description
AQAP	Air Quality Action Plan - A detailed description of measures, outcomes, achievement dates and implementation methods, showing how the local authority intends to achieve air quality limit values'
AQMA	Air Quality Management Area – An area where air pollutant concentrations exceed / are likely to exceed the relevant air quality objectives. AQMAs are declared for specific pollutants and objectives
ASR	Annual Status Report
BAM	Beta Attenuation Monitor
Defra	Department for Environment, Food and Rural Affairs
LAQM	Local Air Quality Management
LSO	Local Site Operator
NO <sub>2</sub>	Nitrogen Dioxide
NO <sub>x</sub>	Nitrogen Oxides
O <sub>3</sub>	Ozone
PM <sub>10</sub>	Airborne particulate matter with an aerodynamic diameter of 10µm or less
PM <sub>2.5</sub>	Airborne particulate matter with an aerodynamic diameter of 2.5µm or less
QA/QC	Quality Assurance and Quality Control
SO <sub>2</sub>	Sulphur Dioxide

## References

- Local Air Quality Management Technical Guidance LAQM.TG16. April 2021. Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland available at; <https://laqm.defra.gov.uk/technical-guidance/>
- Local Air Quality Management Policy Guidance LAQM.PG16. May 2016. Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland available at; <https://laqm.defra.gov.uk/documents/LAQM-PG16-April-16-v1.pdf>
- Local Air Quality Management Diffusion Tube Processing Tool available at; <https://laqm.defra.gov.uk/air-quality/air-quality-assessment/diffusion-tube-data-processing-tool/>
- Local Air Quality Management National Bias Adjustment Factors available at; <https://laqm.defra.gov.uk/air-quality/air-quality-assessment/national-bias/>
- Local Air Quality Management Diffusion Tube QA/QC Framework available at; <https://laqm.defra.gov.uk/air-quality/air-quality-assessment/qa-qc-framework/>