2018
Air Quality Annual Status Report (ASR)

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

March 2019

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Executive Summary: Air Quality in Our Area

Air Quality in East Staffordshire

Air pollution is associated with a number of adverse health impacts. It is recognised as a contributing factor in the onset of heart disease and cancer. Additionally, air pollution particularly affects the most vulnerable in society: children and older people, and those with heart and lung conditions. There is also often a strong correlation with equalities issues, because areas with poor air quality are also often the less affluent areas[1,2].

The annual health cost to society of the impacts of particulate matter alone in the UK is estimated to be around £16 billion[3].

East Staffordshire Borough Council has two Air Quality Management Areas (AQMAs) where exceedances in annual nitrogen dioxide (NO_2) standards exist due to road traffic. Both of the areas are based on road networks, with the larger of the two (AQMA 1) centring on Burton upon Trent and the smaller (AQMA 2) on St Peter's Bridge roundabout in Stapenhill.

Both of the AQMAs can be seen at https://uk-air.defra.gov.uk/aqma/local-authorities?la_id=93. A map of both AQMAs has been included in Appendix D, Figures D.1 and D.2.

For the larger AQMA 1, located towards the centre of Burton upon Trent, whilst many monitored locations meet the annual objective NO_2 40µg/m^3 standard, a number of locations remain over this limit concentration, with the highest being approximately 47µg/m^3. The locations within AQMA 1 with the highest NO_2 concentrations are predominantly centred on Derby Turn and Wellington Street.

[1] Environmental equity, air quality, socioeconomic status and respiratory health, 2010
[2] Air quality and social deprivation in the UK: an environmental inequalities analysis, 2006
[3] Defra. Abatement cost guidance for valuing changes in air quality, May 2013

The trend across AQMA 1 for 2017 was for NO_2 concentrations to either remain the same or for a slight increase. This trend continues from 2016 although over the longer term since 2006 this is a reduction in NO_2. These short term increases in NO_2 concentrations will continue to be monitored although they are often indicative of annual weather variation rather than an overall longer term deterioration of air quality.

AQMA 2, located at St Peters Bridge Island continues to remain just within the annual NO_2 objective, and although this has been the case for a number of years is still too close to the standard to be undeclared at this stage.

With regard to the more recent monitored locations in the vicinity of the A50 in Uttoxeter, a combination of local authority and Highways England diffusion tube monitoring highlight potential annual NO_2 Objective exceedances leading to, from and on the A50/A5030 roundabout. One monitored commercial location highlights potential hourly NO_2 objective exceedance, which can be indicated by annual objectives exceeding 60$\mu g/m^3$.

Recent provisional 2018 monitoring at the time of publication of this report highlights that NO_2 objectives will be met but this will be reported in the ASR2019.

As part of the continued detailed assessment of NO_2 along the A50 in Uttoxeter, monitoring locations have been reviewed and varied during 2017. The monitoring now includes the facades of many of the nearest potential receptors and triplicate co-location with a new automatic monitoring station in Uttoxeter to provide accurate exposure data for future modelling and will be reported in the ASR 2019.

East Staffordshire Borough Council continues to work with partners and stakeholders including Staffordshire County Council Highways Authority, Highways England, Department for Environment Food and Rural Affairs (Defra), other local authorities, third party providers and various local community groups.

There are no new major air pollution sources identified during 2017 within East Staffordshire.

No new AQMAs have been designated in East Staffordshire during 2017.

Endorsement from the Director of Health and Care, Staffordshire County Council

Staffordshire County Council is committed to working with partners to ensure that Staffordshire will be a place where improved health and wellbeing is experienced by all. Poor air quality has a negative impact on public health, with potentially serious consequences for individuals, families and communities. Identifying problem areas and ensuring that actions are taken to improve air quality forms an important element in protecting the health and wellbeing of Staffordshire residents. Improving air quality is often a complex issue, presenting a multi-agency challenge – so it is essential that all agencies work together effectively to deliver improvements where they are needed. Our partnership approach will be further supported by a successful bid to Defra's Air Quality Grant. We were successful in securing £208,000 over two years to deliver an agreed Air Quality Programme across all the Districts and Borough's across Staffordshire and Stoke-on-Trent.

As Director of Health & Care across Staffordshire I endorse this Annual Status Report which sets out the position across the Districts and Boroughs of Staffordshire and Stoke-on-Trent and will support an ongoing work programme to address air quality issues.

Dr Richard Harling
Director of Health and Care
Staffordshire County Council
June 2018

Actions to Improve Air Quality

- In support of the continued detailed assessment of NO_2 concentrations in the vicinity of the A50 in Uttoxeter, Highways England has now completed the commissioning of a roadside automatic monitoring station. The station will be in place for the next 5 years, measuring NO_2. The monitoring station will enable the co-location of diffusion tubes to improve overall monitoring accuracy and support the dispersion modelling required for the detailed assessment.

- The diffusion tube monitoring network in Uttoxeter has been reviewed. The Gradko diffusion tubes provided by Highways England have now been removed

after providing a total of 11 months of monitoring data. The existing local authority diffusion tube network has been extended however, to include tubes located at the façade of receptor locations. This will enable the direct comparison with the annual NO_2 objective at relevant receptors and support dispersion monitoring.

- A number of measures in Burton upon Trent have been completed as part of the East Staffordshire Integrated Transport Strategy to improve traffic flow towards the centre of the town.

Conclusions and Priorities

No new AQMAs have been confirmed or declared during 2017.

Areas of AQMA 1 towards the centre of Burton upon Trent still exceed the annual NO_2 objective and 2017 saw a slight increase in concentration, although the long term trend shows reduced levels. AQMA 2 at Stapenhill roundabout remain just below the annual NO_2 objective.

There were no new significant sources of NO_2 identified during 2017.

Priorities for 2018 relate to completing the detailed assessment of NO_2 concentrations in the vicinity of the A50 in Uttoxeter determine whether there are definitively any objective breaches and therefore a requirement for a new AMQA.

Other priorities involve progressing measures from the East Staffordshire Integrated Transport Strategy, which is predominantly implemented by Staffordshire County Council

Local Engagement and How to get involved

The general public can take simple measures to help improve air quality, the main ones being, where possible, making short trips and journeys on foot or by bike instead of by car, or using public transport. Car sharing with colleagues, or with other parents on the school run, are other examples of ways to reduce traffic congestion. Other measures are listed below:

- Purchasing low-emission electric and/or hybrid vehicles, with government funding and grants available.
- Upgrading boilers to newest and most efficient gas condensing boilers with lowest NOx (and carbon) emissions.
- Renewable energy generation via solar photovoltaics or wind turbine installation (although individual effects on air quality is minor and non-local).
- Businesses, which operate fleet vehicles (lorries, vans, buses, coaches etc.,) can become members of the Eco Stars Fleet recognition Scheme and get free advice on managing their fleet to improve fuel efficiency and reduce emissions.

Air quality enquiries can be made to Environmental Health:

Tel: 01283 508509 or Email: ehsupport@eaststaffsbc.gov.uk

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1 Local Air Quality Management

This report provides an overview of air quality in East Staffordshire during 2017. It fulfils the requirements of Local Air Quality Management (LAQM) as set out in Part IV of the Environment Act (1995) 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 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. This Annual Status Report (ASR) is an annual requirement showing the strategies employed by East Staffordshire Borough Council to improve air quality and any progress that has been made.

The statutory air quality objectives applicable to LAQM in England can be found in Table E.1 in Appendix E.

2 Actions to Improve Air Quality

2.1 Air Quality Management Areas

Air Quality Management Areas (AQMAs) are declared when there is an exceedance or likely exceedance of an air quality objective. After declaration, the authority must prepare an Air Quality Action Plan (AQAP) within 12-18 months setting out measures it intends to put in place in pursuit of compliance with the objectives.

A summary of the two AQMAs declared by East Staffordshire Borough Council can be found in Table 2.1 with maps included in Appendix D. Further information related to declared or revoked AQMAs in England and Wales, including maps of AQMA boundaries, are available online at: https://uk-air.defra.gov.uk/aqma/local-authorities?la_id=93.

Appendix D: Map(s) of Monitoring Locations and AQMAs, provides maps of the AQMA(s).

Table 2.1 – Declared Air Quality Management Areas

AQMA Name	Date of Declaration	Pollutants and Air Quality Objectives	City / Town	One Line Description	Is air quality in the AQMA influenced by roads controlled by Highways England?	Level of Exceedance (maximum monitored/modelled concentration at a location of relevant exposure)				Action Plan		
						At Declaration		Now		Name	Date of Publication	Link
AQMA 1 Burton upon Trent	26/05/2007	NO_2 annual mean	Burton upon Trent (Town)	This AQMA includes a number of arterial roads located towards the centre of Burton upon Trent.	NO	61.9	µg/m^3 modelled	47.1	µg/m^3 monitored	Air Quality Action Plan 2015-2020	2015	Air Quality Action Plan 2015-2020
AQMA 2 St Peter's Bridge roundabout	26/05/2007	NO_2 annual mean	Stapenhill, Burton upon Trent	Small AQMA centred on a roundabout at the end of St Peter's Bridge in Stapenhill.	NO	43.9	µg/m^3 modelled	39	µg/m^3 monitored	Air Quality Action Plan 2015-2020	2015	Air Quality Action Plan 2015-2020

☒ **East Staffordshire Borough Council confirm the information on UK-Air regarding their AQMA(s) is up to date**

2.2 Progress and Impact of Measures to address Air Quality in East Staffordshire

Defra's appraisal of the 2017 ASR concluded that it was well structured and contained most of the information specified in the guidance.

East Staffordshire Borough Council has taken forward a number of direct measures during the current reporting year of 2017 in pursuit of improving local air quality. Details of all measures completed, in progress or planned are set out in Table 2.2.

More detail on these measures can be found in their respective Action Plans.

Key completed measures are:

- **AURN monitoring station established**

An Automatic Urban Rural Network (AURN) air quality monitoring station has now been installed at an urban background site at Masefield Crescent, Burton upon Trent and is operated by Bureau Veritas on behalf of the Environment Agency.

- **A50 monitoring station established**

An automatic monitoring station has now been installed at an A50 roadside location in Uttoxeter. This station, which monitors NO_2 is operated and funded by Highways England as part of a partnership approach to a detailed assessment of air quality on the A50 through Uttoxeter. The station will help provide accurate monitoring to help to bias correct the diffusion tube network in Uttoxter and enable the modelling of hourly NO_2 concentrations for comparison with the hourly standard.

- **A50 diffusion tube network revised to include receptor facades**

The diffusion tube network in Uttoxeter has been reviewed, the Gradko diffusion tubes supplied by Highways England have now stopped but East Staffordshire Borough Council has significantly extended it's tube numbers and now has diffusion tubes located on the façades of a number of the nearest relevant receptors.

- **A50 traffic count undertaken**

A traffic count exercise has now been completed through the commissioning of an Automatic Number Plate Recognition (ANPR) survey to provide greater detail on the type of vehicles using the A50. This information helps with any computer modelling that may be required and given that traffic is the likely source of elevated NO_2 concentrations helps understand the impact of the types of vehicles using the A50 corridor.

- **East Staffordshire Integrated Transport Strategy**

A number of schemes are currently being progressed as part of the Town Centre Regeneration Programme which will aid traffic management. Many of these measures will then potentially help improve traffic flow within the AQMAs.

- The traffic signal cycle time on Union Street between Orchard Street and Guild Street was reduced towards the end of 2017. According to surveys, this has helped to reduce delays along this corridor. This was part of the Burton Town Centre Traffic Management package.
- Changes to traffic flow in Coopers Square were implemented in 2017.This was done to reduce the number of occasions when traffic going in to the car park gets held up and backs onto Union Street.
- An experimental Traffic Restriction Order (TRO) is currently in place on New Street and will remain experimental until reconfiguration works are completed on the nearby Manor Croft. Consideration will then be made by Staffordshire County Council on whether to make the TRO permanent.

- **Staffordshire Eco Stars**

The Staffordshire and Stoke 'Eco-stars' scheme which was formally launched in 2016 continues.

The ECO Stars Fleet Recognition scheme, managed by specialist transport consultants, Transport and Travel Research Ltd (TTR) helps commercial fleet operators improve their efficiency, reduce fuel consumption and emissions and make cost savings and awards a 5 star rating to measure progress.

The consortium of local authorities that make up the Staffordshire & Stoke ECO Stars scheme are: Cannock Chase, East Staffordshire, Lichfield, Newcastle under Lyme, South Staffordshire, Stafford Borough, Stoke-on-Trent City Council and Staffordshire Moorlands.

East Staffordshire Borough Council's waste vehicle fleet was previously assessed under the scheme.

Future 2018 measures:

East Staffordshire Borough Council's priorities for the coming year are:

- **Detailed assessment of nitrogen dioxide concentrations along the A50 at Uttoxeter**

East Staffordshire Borough Council will undertake further work towards the Detailed Assessment of nitrogen dioxide concentrations along the A50 in Uttoxeter. The decision made previously was to collate more technical information prior to any decision to declare an AQMA.

Now diffusion tubes are located at receptor façades, sufficient directly applicable monitoring data will be available over the exposure periods representative of the objectives. Initial monitoring results over the last 3 months of 2017 show a large fall off with distance with roadside and concentrations below objective concentrations. The monitoring network will be maintained through 2018 and with the support of Highways England, dispersion modelling will be undertaken if required to identify any areas of NO_2 objective exceedance.

A number of measures will be implemented which originate from Staffordshire County Council's Integrated Transport Improvements planned for 2018/19.

- **Staffordshire Freight Forum (2018-19)**

Burton will potentially benefit from measures arising from actions arising from the Staffordshire Freight Forum. This could include weight limits, signals and signing.

- **Real time bus passenger information project management & infrastructure improvements (2018-19)**

RTPI project management, including partnership working with bus companies across Staffordshire will continue to expand. This includes the re-allocation/installation of new infrastructure to accommodate bus service changes. This will also include the new RTPI information on My Staffs App, planned in 2018.

- **A444 corridor study (2018-19)**

The study will identify, design & implement transport improvements to deal with existing issues along the corridor for all modes of transport. This could include a pedestrian crossing close to the Spring Terrace Road/A444 junction, improving access to the Washlands. Longer-term solutions also need to be identified that will accommodate forecast development traffic, particularly from the Drakelow development.

- **Burton Town Centre Regeneration Project (Manor Croft and design of New St/High St junction)**

Delivery of the Burton upon Trent town centre regeneration project will continue, delivered jointly by Staffordshire County Council and East Staffordshire Borough Council. This will improve the layout of Manor Croft parking and review the layout of the New Street/High Street junction is proposed to enhance pedestrian priority.

- **Burton rail station improvements**

Improvements to the rail station forecourt and Station Road adjacent to the station will be delivered during 2018/19. Improvements include revised car park layout, improved pedestrian and cycle facilities and enhanced bus stops.

- **Electric vehicle charge point project**

A study will be undertaken to investigate the potential for delivering a scheme in Staffordshire in 2019/20 for businesses and on-street residential areas.

Progress on measures has been slower than expected due to competing local authority priorities and demands at a time of reduced resourcing.

Whilst the measures stated above and in Table 2.2 will help to contribute towards compliance, East Staffordshire Borough Council anticipates that further additional measures not yet prescribed will be required in subsequent years to achieve compliance and enable the revocation of our AQMAs.

Table 2.2 – Progress on Measures to Improve Air Quality

Measure No.	Measure	EU Category	EU Classification	Organisations involved and Funding Source	Planning Phase	Implementation Phase	Key Performance Indicator	Reduction in Pollutant / Emission from Measure	Progress to Date	Estimated / Actual Completion Date	Comments / Barriers to implementation
1	Walton on Trent bypass (third river crossing)	Transport Planning and Infrastructure	Transport Planning and Infrastructure	Staffordshire County Council/Derbyshire County Council	Commenced / ongoing			Medium-high	Phase 1 under way	2020	Project details can be found at www.drakelowpark.com
2	Town Centre Regeneration Programme	Traffic Management	Strategic highway improvements, Re-prioritising road space away from cars, including Access management, Selective vehicle priority, bus priority, high vehicle occupancy lane	Staffordshire County Council/East Staffordshire Borough Council	Commenced / ongoing	2016-2031		Medium-high	Changes to traffic flow in Coopers Square were implemented in 2017. An experimental Traffic Restriction Order (TRO) is currently in place on New Street. The traffic signal cycle time on Union Street between Orchard Street and Guild Street was reduced towards the end of 2017	Up to 2031	
3	Improved bus provision/services	Transport Planning and Infrastructure	Bus route improvements	Staffordshire County Council	Completed	2016-2020		Low-medium	Two re-alignment schemes at Borough Road and New Street delivered 2016-17	2020	Now completed
4	A5189/A444 network reinforcement & enhanced cycling/pedestrian facilities	Transport Planning and Infrastructure	Other	Staffordshire County Council	2017/18	Up to 2031		Low	A444 study in 2018/19 will identify, design & implement transport improvements to deal with existing issues along the corridor for all modes of transport. Essential bridge maintenance work now completed	Up to 2031	

Measure No.	Measure	EU Category	EU Classification	Organisations involved and Funding Source	Planning Phase	Implementation Phase	Key Performance Indicator	Reduction in Pollutant / Emission from Measure	Progress to Date	Estimated / Actual Completion Date	Comments / Barriers to implementation
5	Local transport corridors	Traffic Management	Strategic highway improvements, Re-prioritising road space away from cars, including Access management, Selective vehicle priority, bus priority, high vehicle occupancy lane	Staffordshire County Council	2017/18	2016-2020		Medium	2018/19 B5017 Corridor Improvements between Wellington Road/Shobnall Road and Postern Road (design and investigation)	2020	
6	Completion of National Cycle Route NCN63 through Burton upon Trent	Promoting Travel Alternatives	Promotion of cycling	Staffordshire County Council	2017/18	2017/18	Route delivered	Low	Not yet agreed with stakeholders		Safer route through Burton avoiding New St & Union Street
7	Burton rail station forecourt improvements	Transport Planning and Infrastructure	Public transport improvements -interchanges stations and services	Staffordshire County Council/Network Rail	2017/18	2018/19	Scheme implemented	Low	Improvements to the rail station forecourt and Station Road adjacent to the station will be delivered during 2018/19. Improvements include revised car park layout, improved pedestrian and cycle facilities and enhanced bus stops.	2018/19	
8	Eco-stars recognition scheme	Freight and Delivery Management	Other	Staffordshire local authorities	2015/16	2016/17	Low		Scheme ongoing until target number agreed with deliverer reached		Funding due to cease in 2017

Measure No.	Measure	EU Category	EU Classification	Organisations involved and Funding Source	Planning Phase	Implementation Phase	Key Performance Indicator	Reduction in Pollutant / Emission from Measure	Progress to Date	Estimated / Actual Completion Date	Comments / Barriers to implementation
9	Development control policy for air quality management & subsequent environmental supplementary planning guidance	Policy Guidance and Development Control	Other policy	East Staffordshire Borough Council	2017	2019		Medium	Some initial work undertaken and used for some planning applications Ongoing		Consideration towards a Staffordshire wide planning document for air quality
10	Investigation of feasibility for S.106 obligations and community infrastructure levy funding for air quality	Policy Guidance and Development Control	Other policy	East Staffordshire Borough Council	2017	2019		Medium	Some initial work undertaken and used for some planning applications Ongoing		
11	Feasibility study for low emission vehicles and associated infrastructure	Policy Guidance and Development Control	Other policy	East Staffordshire Borough Council	2015	2016		Low	Proposal for two charging points in Coopers Square car park not adopted		
12	Investigation into funding streams for bus operators	Alternatives to private vehicle use	Other	East Staffordshire Borough Council	2017	2017		Med			
13	Partnership working with public health	Public Information	Other	East Staffordshire Borough Council	2016	2017		Low	Public health presence at Staffordshire Air Quality Forum & projects being developed for 2018/19	Ongoing	Ongoing
14	Partnership working with Staffordshire County Council	Promoting Travel Alternatives	Other	East Staffordshire Borough Council	2017	2017		Low	Project linked with public health partnership above	Ongoing	

Measure No.	Measure	EU Category	EU Classification	Organisations involved and Funding Source	Planning Phase	Implementation Phase	Key Performance Indicator	Reduction in Pollutant / Emission from Measure	Progress to Date	Estimated / Actual Completion Date	Comments / Barriers to implementation
	in promoting sustainable travel										
15	Enhancement of the Council website for air quality & updating leaflets & other Council publications	Public Information	Via the Internet	East Staffordshire Borough Council				Low		Ongoing	
16	Ongoing review of the air quality monitoring network							Low	Undertaken to include façade locations in Uttoxeter	Ongoing	
17	Environmental permitting	Environmental Permits	Other	East Staffordshire Borough Council	Ongoing	01-Apr-17	All scheduled inspections completed	Low	Ongoing	31-Mar-18	Statutory requirement
18	Detailed Air Quality Assessment- A50 Uttoxeter	Other	Other	East Staffordshire Borough Council/Highways England	Ongoing	2017-2018	Assessment completed	Low	Automatic monitoring station installed along A50 in Uttoxeter for 5 years. Automatic number plate recognition undertaken. Diffusion tube locations now include facades	2018/19	
19	AURN site located	Other	Other	Environment Agency		2016	AURN site located	Low	Site now in place in Eton Ward	2017	

2.3 $PM_{2.5}$ – Local Authority Approach to Reducing Emissions and/or Concentrations

As detailed in Policy Guidance LAQM.PG16 (Chapter 7), local authorities are expected to work towards reducing emissions and/or concentrations of $PM_{2.5}$ (particulate matter with an aerodynamic diameter of 2.5µm or less). There is clear evidence that $PM_{2.5}$ has a significant impact on human health, including premature mortality, allergic reactions, and cardiovascular diseases.

Particulate matter, or PM, is the term used to describe particles found in the air, including dust, dirt and liquid droplets. PM comes from both natural and man-made sources, including traffic emissions and Saharan-Sahel dust. These particles can be suspended in the air for long periods of time, and can travel across large distances.

PM less than 10 micrometres in diameter (PM_{10}) pose a health concern because they can be inhaled into and accumulate in the respiratory system. PM less than 2.5 micrometres in diameter ($PM_{2.5}$) are referred to as "fine" particles and are believed to pose the greatest health risks, as they can lodge deeply into the lungs and also pass into the bloodstream.

$PM_{2.5}$ is the pollutant which has the biggest impact on public health and on which the Public Health Outcomes Framework (PHOF) indicator 3.01[5] is based.

The Royal College of Physicians (RCP) undertook a review in February 2016 [6] where they found that long term exposure to air pollution impairs lung function growth in children, and that outdoor exposure is linked to lung cancer in adults. Within Staffordshire it is estimated that 4.8%of all deaths can be attributed to exposure to $PM_{2.5}$, compared to 5.1% across England (40,000 deaths annually)[4]. Overall, the estimated cost to individuals and society is more than £20 billion annually for the UK.

[4] Mortality attributable to particulate air pollution Public Health Outcomes Framework
[5] Public Health Outcomes Framework 2016 – 2019 indicator 3.01 Fraction of mortality attributable to particulate air pollution https://fingertips.phe.org.uk/profile/public-health-outcomes-framework/data#page/3/gid/1000043/pat/6/par/E12000005/ati/102/are/E10000028/iid/30101/age/230/sex/4
[6] ['Every Breath we Take: The Lifelong Impact of Air Pollution; Report of a working Party, February 2016, ISBN 978-1-86016-567-2],

2.3.1 Particulate Matter ($PM_{2.5}$) Levels in Staffordshire and Stoke-on-Trent

A number of the Staffordshire Authorities currently monitor locally for PM_{10}. Defra's Automatic Urban and Rural Network (AURN) site Stoke-on-Trent Centre has a dedicated $PM_{2.5}$ monitor. Table 2.3 presents data on the local level of $PM_{2.5}$ annual mean concentrations for the Staffordshire Authorities.

Where the data is derived from PM_{10} monitoring this has been adjusted by applying a correction factor of 0.7 to derive the $PM_{2.5}$ component. The correction factor has been derived from the average of all ratios of $PM_{2.5}/PM_{10}$ for the years from 2010 to 2014 for forty sites within the Automatic Urban and Rural Network (AURN) where these substances are measured on an hourly basis and follows the guidance published in LAQM (TG16).

Table 2.3 - Annual Mean PM_{10} and $PM_{2.5}$ results of monitoring by Staffordshire Authorities 2012 to 2017

Annual Mean PM10 and PM2.5 Results from monitoring Staffordshire Authorities 2013- 2017									
Authority	**Site Type**	**Monitor Location**	**OS Grid Ref**		**Year**				
					2013	**2014**	**2015**	**2016**	**2017**
Newcastle under Lyme	Roadside	Queen`s Gardens	E385057	PM_{10}	22.5	22	22.9	(5)	(5)
			N346137	$PM_{2.5}$	15.75(1)	15.4(1)	16(1)	(5)	(5)
Cannock Chase	Roadside	Cannock A5190	E401392 N309954	PM_{10}	-	-	-	-	14
				$PM_{2.5}$	-	-	-	-	9.8
Stoke on Trent	Roadside	Basford	E386288	PM 10	-	-	-	-	23
			N346802	$PM_{2.5}$	-	-	-	-	16
	Roadside	A50 Meir Tunnel	E392548	PM 10	-	-	20(2)	20	18
			N342572	$PM_{2.5}$	-	-	14(2)	14	13
	Urban Background	Stoke on Trent Central	E388351 N347895	PM 2.5	10	10	12	12	9
	Roadside	Middleport	E385780	MP10	25	24	22	(3)	(3)
			N349376	PM2.5	18(1)	17(1)	15(1)	(3)	(3)
East Staffordshire	Roadside	Derby Tum	E424671 N324019	PM 10	29	31	23	(4)	(4)
				PM 2.5	20.3(1)	21.7(1)	16.1(1)	(4)	(4)

Notes: (1)PM2.5 results are derived from PM10 monitored results corrected with a 0.7 correction factor in accordance with TG16 – Annex B: Derivation of $PM_{2.5}$ to PM_{10} Ratio. All other results are directly monitored.
(2) Valid data capture for 2015 was 59%. The site was commissioned on 22 May 2015.
(3) Middleport monitor was decommissioned at the end 2015
(4) East Staffordshire`s monitors were decommissioned 2016
(5) Newcastle under Lyme monitors were Decommissioned 2016

As can be seen from the results, concentrations of $PM_{2.5}$ within the Staffordshire Authorities are below the 2020 EU limit value of 25µg/m3.

2.3.2 $PM_{2.5}$ and Mortality in Staffordshire & Stoke-on-Trent

Although the levels of $PM_{2.5}$ within the County and City of Stoke on Trent are below the 2020 EU Limit value, the impact on adult mortality directly attributable to $PM_{2.5}$ is nonetheless still an important public health issue within Staffordshire and Stoke-on-Trent.

This is revealed in data obtained from Public Health England used to inform Public Health Outcomes Framework indicator 3.01[7], as shown in Table 2.5.

The percentage estimated number of deaths attributable to $PM_{2.5}$ in adults over 30 has been translated into the estimated number of attributable deaths for each local authority area within Staffordshire, and are shown in Table 2.4. The data presented to 2013 is the latest data available at time of publication of this report. Approximately 5% of deaths within the County can be attributed to $PM_{2.5}$.

Table 2.4 - Estimated number of deaths by local authority area attributable to PM2.5 within Staffordshire for adults over 2012 to 2016

District/County	Percentage
Newcastle-under-Lyme	4.7%
Stafford	4.8%
East Staffordshire	5.1%
South Staffordshire	4.9%
Lichfield	5.1%
Staffordshire Moorlands	4.4%
Cannock Chase	5.0%
Tamworth	5.4%
Stoke on Trent	4.9%
Staffordshire County	4.9%
England	5.2%

7 Public Health Outcomes Framework 2016-2019Indicator 3.01 Fraction of mortality attributable to particulate air pollution https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/520457/At_a_glance.pdf

Table 2.5 - Public Health Outcomes Framework Indicator 3.01- Fraction of annual all cause adult mortality attributable to anthropogenic (human made) particulate air pollution (measured as fine particulate matter, $PM_{2.5}$) for Staffordshire Authorities 2012 to 2016[8]

Estimated numbers of annual all-cause adult mortality attributable to anthropogenic (human-made) particulate air pollution (measured as fine particulate matter, $PM_{2.5}$*) for Staffordshire 2012 to 2016[8] *** Fraction of annual all-cause adult mortality attributable to anthropogenic (human-made) particulate air pollution (measured as fine particulate matter, $PM_{2.5}$*)**														
	2012			**2013**			**2014**			**2015**			**2016**		
District/County	Deaths - all causes persons 30+	%*	Estimated attributable deaths	Deaths - all causes persons 30+	%*	Estimated attributable deaths	Deaths - all causes persons 30+	%*	Estimated attributable deaths	Deaths - all causes persons 30+	%*	Estimated attributable deaths	Deaths - all causes persons 30+	%*	Estimated attributable deaths
Newcastle-under-Lyme	1218	4.6	60	1295	4.9	60	55	4.7	60	55	4.2	50	1291	4.7	60
Stafford	1195	4.6	50	1261	4.9	60	65	4.8	60	60	4.7	60	1254	4.8	60
East Staffordshire	966	4.8	60	1097	5.1	60	55	5.1	50	55	4.8	50	1065	5.6	60
South Staffordshire	1162	4.8	60	1102	5.1	60	55	5	50	55	4.7	60	1128	5.1	60
Lichfield	953	5	50	1050	5.1	50	50	5	50	50	4.6	50	1044	5.5	60
Staffordshire Moorlands	1020	4.2	40	1085	4.7	50	45	4.5	50	45	4	40	1110	4.6	50
Cannock Chase	844	4.8	40	787	5.1	40	45	5.1	40	45	4.6	40	879	5.4	50
Tamworth	553	5.2	30	592	5.5	30	35	5.4	30	30		30	615	6	40
Stoke on Trent	2386	4.9	115	2412	5.2	125	2318	5.0	115	2479	4.9	110	2454	5.0	120
Staffordshire County	7911	4.7	372	8269	5	420	400	4.9	400	390	4.5	390	8386	5.2	430

8 Source Public Health England https://fingertips.phe.org.uk/profile/public-health-outcomes-framework/data#page/3/gid/1000043/pat/6/par/E12000005/ati/102/are/E10000028/iid/30101/age/230/sex/4

2.3.3 Actions being taken within Staffordshire to reduce $PM_{2.5}$

A number of the Staffordshire Authorities are currently involved in implementing measures to reduce levels of NO_2 within their areas, which are detailed elsewhere in this report. Whilst there is currently no statutory duty imposed on Local Authorities in England to reduce $PM_{2.5}$, a number of the measures are complementary. A mapping exercise completed by the Staffordshire Air Quality Forum members details the measures currently in place which are considered to have an impact in reducing $PM_{2.5}$ within the County. These are produced in Table 2.6 below;

Table 2.6 - Actions being taken within Staffordshire to reduce $PM_{2.5}$

Measures category	Measure Classification	Effect on reducing NOx and PM10 emissions(low, medium, high)	Reduces PM2.5 emissions	Local Authority								
				Stoke on Trent CC	Staffordshire Moorlands DC	Newcastle under -Lyme BC	Stafford BC	Cannock Chase DC	East Staffs BC	Lichfield DC	South Staffs DC	Tamworth BC
Traffic Management	Urban Traffic Control systems, Congestion management, traffic reduction	low			UTC in Leek Town Centre	UTC in areas of Newcastle Town Centre AQMA and Kidsgrove AQMA	UTC in Stafford Town Centre	UTC in Cannock Town Centre	UTC in Burton Town Centre	Investigations ongoing into UTC in areas of Lichfield City Centre		UTC in Tamworth Town Centre at Ventura Park
	Reduction of speed limits, 20mph zones	low					20mph zones near some schools in residential areas	20mph zones in Brereton, Hednesford and Rugeley	20 mph zones near some schools in residential areas		20mph zones in Trysull, Bradley, Kinver and Bilbrook	
	Road User Charging (RUC)/ Congestion charging	low						M6 Toll		M6 Toll	M6 Toll	
	Anti-idling enforcement	low										
	Other											
Promoting Travel Alternatives	Workplace Travel Planning	low		https://www.staffordshire.gov.uk/transport/greentravel/travelplans/home.aspx								
	Encourage / Facilitate home-working	low		Agile working adopted by Stoke-on-Trent CC				Homeworking policy adopted	Homeworking policy adopted			
	School Travel Plans	low		Modeshift STARS	https://www.staffordshire.gov.uk/transport/Stafford/Schools/School-Travel-STARS.aspx							
	Promotion of cycling	low		Stoke-on-Trent Cycle Map & Guide	https://www.staffordshire.gov.uk/transport/greentravel/cycling/Cycling.aspx							
	Promotion of walking	low		Travel Smart	https://www.staffordshire.gov.uk/Search.aspx?search_keywords=walking							

Measures category	Measure Classification	Effect on reducing NOx and PM10 emissions(low, medium, high)	Reduces PM2.5 emissions	Local Authority								
				Stoke on Trent CC	Staffordshire Moorlands DC	Newcastle under -Lyme BC	Stafford BC	Cannock Chase DC	East Staffs BC	Lichfield DC	South Staffs DC	Tamworth BC
	Staffordshire Share a Lift Scheme			Stoke-on-Trent Share a Lift Scheme	https://www.staffordshire.gov.uk/transport/greentravel/carsharing/Q002.aspx							
	Promote use of rail and inland waterways	medium		North Staffordshire Community Rail Partnership				Staffordshire County Council is a member of West Midlands Rail Ltd which will bring a change in the way that local rail services are managed and operated. The County Council Draft Rail Strategy is available from: Link &Link	Community Rail Partnership operating along the North Staffordshire Line and includes Uttoxeter Rail Station. The County Council Draft Rail Strategy is available from: http://modernggov.staffordshire.gov.uk/documents/s69891/Appendix%201%20for%20Rail%20Strategy.pdf			
Transport Planning and Infrastructure	Local Transport Plans and District Strategies	high		Local Transport Plan	https://www.staffordshire.gov.uk/transport/transportplanning/localtransportplan/Integrated-transport-documents/East-Staffordshire-Transport.pdf							

Measures category	Measure Classification	Effect on reducing NOx and PM10 emissions(low, medium, high)	Reduces PM2.5 emissions	Local Authority								
				Stoke on Trent CC	Staffordshire Moorlands DC	Newcastle under -Lyme BC	Stafford BC	Cannock Chase DC	East Staffs BC	Lichfield DC	South Staffs DC	Tamworth BC
	Public transport improvements- interchanges stations and services	low		Improvements around Stoke-on-Trent railway station in development		Kidsgrove Station interchange planned 2018	Recent improvements completed at Stafford Rail Station	Planned improvements at Cannock Station as part of Mill Green development	Planned improvements at Burton Rail Station	Planned improvements at Lichfield City station as part of Friarsgate development. Lichfield Trent Valley improvements to make station accessible		Planned improvements at Tamworth station
	Public cycle hire scheme	low		Stoke Railway Station 'Brompton Dock' Bike Hire & Cycle Hub				In house Cycle to work scheme				
	Cycle network	low		Stoke-on-Trent Cycle Map & Guide	www.staffordshire.gov.uk/transport/greentravel/cycling/Cycling.aspx							
	Bus route improvements	high		Improvements around Stoke-on-Trent railway station in development	Continued delivery of demand responsive public transport Moorlands Connect, bus infrastructure improvements to route 9 Biddulph-Hanley	RTPI routes 3 & 4 Newcastle Town Centre. Improved future bus services to Chatterley Valley	RTPI Stafford Town Centre, A34 RTPI and bus priority measures, Stafford. Improved bus priority abd interchange on A518, Stafford post-SWAR	Proposed improvements to services 23,24 and 26 in Rugeley, service 2 Cannock-Walsall and service 32/33 Pye Green	New Street, Burton interchange enhancements . RTPI Burton Town Centre. Stop upgrades on A511, B5017 and B5108 Improvements to Uttoxeter bus station.	New central bus station. New or extended services to Fradley. New bus infrastructure Burntwood Town Centre. RTPI Lichfield City Centre.	Improved bus infrastructure Gt Wyrley to Bloxich corridor, & on routes 256 Wombourne to Stourbridge, 255 Wolverhampton to Merry Hill, 5 Codsall to Wolverhmapton, 1 Huntington to Walsall and 54 Stafford to Wolverhampton.	Improved bus infrastructure route 2 Tamworth-Perrycrofts. RTPI Tamworth Town Centre and Ventura Park. Victoria Road, Tamworth upgraded interchange.
	Bus based Park & Ride	medium						nil				

Measures category	Measure Classification	Effect on reducing NOx and PM10 emissions(low, medium, high)	Reduces PM2.5 emissions	Local Authority								
				Stoke on Trent CC	Staffordshire Moorlands DC	Newcastle under -Lyme BC	Stafford BC	Cannock Chase DC	East Staffs BC	Lichfield DC	South Staffs DC	Tamworth BC
Alternatives to private vehicle use	Car Clubs	low						nil				
Policy Guidance and Development Control	Planning applications to require assessment of exposure / emissions for development requiring air quality impact assessment	high						Local plan - Policy CP16 - Climate Change and Sustainable Resource Use Cannock chase. Www.cannockchasedc.gov.uk/sites/default/files/local_plan_part_1_09.04.14_low_res.pdf	http://www.eaststaffsbc.gov.uk/planning/planning-policy/local-plan-2012-2031	-		
Policy Guidance and Development Control	Air Quality Strategy			Local Air Quality Strategy - Stoke-on-Trent City Council				nil	http://www.eaststaffsbc.gov.uk/environmental-health/pollution/bonfires			
	Planning Guidance for developers			To develop planning guidance for developers and to develop into SPD once Local Plan Policies in Place				http://www.cannockchasedc.gov.uk/residents/planning/planning-policy/supplementary-planning-policy-documents	http://www.eaststaffsbc.gov.uk/environmental-health/pollution/bonfires			
	Developer Contributions based on damage cost calculation			To develop policies to secure contributions to offset pollution				http://www.cannockchasedc.gov.uk/sites/default/files/local_plan_part_1_09.04.14_low_res.pdf	Yes			

Measures category	Measure Classification	Effect on reducing NOx and PM10 emissions(low, medium, high)	Reduces PM2.5 emissions	Local Authority								
				Stoke on Trent CC	Staffordshire Moorlands DC	Newcastle under -Lyme BC	Stafford BC	Cannock Chase DC	East Staffs BC	Lichfield DC	South Staffs DC	Tamworth BC
	Planning Policies			To influence policies to support improvements in emissions through development of Staffordshire and Stoke-on-Trent Joint Local Plan					http://www.eaststaffsbc.gov.uk/sites/default/files/docs/pollution/Air%20Quality%20Policy%20for%20Development%20Control%20%28Public%20Version%29.pdf			
	STOR Sites (Short Term Operating Reserve) Energy Generation. Regulation via planning / permitting regime	high		To lobby Central Government via appropriate forums (e.g. Staffordshire Air Quality Forum / Midlands Joint Advisory Council) for consideration of air quality implications at a national level and to support local authorities and developers with appropriate guidance.								
	Low Emissions Strategy	high										
	Freight Consolidation Centre	medium										
Freight & Delivery Management	Route Management Plans/ Strategic routing strategy for HGV's	high			https://www.staffordshire.gov.uk/transport/transportplanning/localtransportplan/appendixl-staffordshirefreightstrategy.pdf							
	Quiet & out of hours delivery	low										
	Delivery and Service plans	medium										

Measures category	Measure Classification	Effect on reducing NOx and PM10 emissions(low, medium, high)	Reduces PM2.5 emissions	Local Authority								
				Stoke on Trent CC	Staffordshire Moorlands DC	Newcastle under -Lyme BC	Stafford BC	Cannock Chase DC	East Staffs BC	Lichfield DC	South Staffs DC	Tamworth BC
	Freight Partnerships for city centre deliveries	high										
Vehicle Fleet Efficiency	Driver training and ECO driving aids	medium										
	Promoting low emission public transport	high										
	Vehicle retrofitting programmes	medium										
	Fleet efficiency and recognition schemes	medium		Staffordshire and Stoke-on-Trent Eco-Stars http://www.ecostars-uk.com/eco-stars-schemes/								
Promoting low emission transport	Low emission zone (LEZ) Clean Air Zone (CAZ)	high										
	Public Vehicle Procurement - Prioritising uptake of low emission vehicles	high						Waste fleet vehicles comply with Euro VI.				
	Company Vehicle Procurement - Prioritising uptake of low emission vehicles	high										
	Procuring alternative Refuelling infrastructure to promote	high										

Measures category	Measure Classification	Effect on reducing NOx and PM10 emissions(low, medium, high)	Reduces PM2.5 emissions	Local Authority								
				Stoke on Trent CC	Staffordshire Moorlands DC	Newcastle under -Lyme BC	Stafford BC	Cannock Chase DC	East Staffs BC	Lichfield DC	South Staffs DC	Tamworth BC
	Low Emission Vehicles, EV recharging, Gas fuel recharging											
	Priority parking for LEV's	high		Electric Vehicle charging spaces								
	Taxi Licensing conditions	medium		Hackney Carriage & Private Hire Licensing Policy 2016-2019								
	Taxi emission incentives	medium										
Environmental permits	Introduction/increase of environment charges through permit systems and economic instruments (Permit fees set centrally)	medium						Unable to achieve at a local level without central government approval				
	Measures to reduce pollution through IPPC Permits going beyond BAT	medium		https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/211863/env-permitting-general-guidance-a.pdf (Chapter 15)								
	Large Combustion Plant Permits and National Plans going beyond BAT	high										
	Other	??										

Measures category	Measure Classification	Effect on reducing NOx and PM10 emissions(low, medium, high)	Reduces PM2.5 emissions	Local Authority								
				Stoke on Trent CC	Staffordshire Moorlands DC	Newcastle under -Lyme BC	Stafford BC	Cannock Chase DC	East Staffs BC	Lichfield DC	South Staffs DC	Tamworth BC
Other measures	Smoky Diesel Hotline			https://www.gov.uk/report-smoky-vehicle								
	A5 and M6 Partnership							http://www.hinckley-bosworth.gov.uk/info/10020/strategies_plans_and_policies/1272/a5_partnership				
	Domestic Smoke Control advice and Enforcement			Smoke control advice	-	-		http://www.cannockchasedc.gov.uk/residents/environmental-health/environmental-protection/chimney-smoke	http://www.eaststaffsbc.gov.uk/environmental-health/pollution/smoke-control-areas	-		
	Garden Bonfires - Advice and nuisance enforcement			Garden bonfires advice	-	-		http://www.cannockchasedc.gov.uk/residents/environmental-health/environmental-protection/bonfire-smoke-nuisance	http://www.eaststaffsbc.gov.uk/environmental-health/pollution/bonfires	-		
	Commercial burning advice and enforcement				-	-		http://www.cannockchasedc.gov.uk/residents/environmental-health/environmental-protection/bonfire-smoke-nuisance	http://www.eaststaffsbc.gov.uk/environmental-health/pollution/bonfires			

Measures category	Measure Classification	Effect on reducing NOx and PM10 emissions(low, medium, high)	Reduces PM2.5 emissions	Local Authority								
				Stoke on Trent CC	Staffordshire Moorlands DC	Newcastle under -Lyme BC	Stafford BC	Cannock Chase DC	East Staffs BC	Lichfield DC	South Staffs DC	Tamworth BC
	Multi agency working with Fire Service and Environment Agency for trade burning		□		-	-	□	Information shared as appropriate	yes			
	Multi agency working with Staffordshire Fire Service and Local Authority Building Control regarding chimney fires and complaints about DIY domestic heating systems		□		-	-		Information shared as appropriate	yes			
	Stoke-on-Trent Low Carbon District Heat Network		□	Stoke-on-Trent Low Carbon District Heat Network	-	-						

2.3.4 $PM_{2.5}$ in Staffordshire & Stoke-on-Trent - Next steps

As $PM_{2.5}$ is an issue requiring collaboration between the district, county and city authorities within Staffordshire, the following actions are proposed in addition to those outlined in the action plan. Progress on these and the action plan will be detailed in the 2019 ASR.

- To agree a target for reducing Fraction of All-Cause Mortality from $PM_{2.5}$ in each district, city and county authority by 2020
- To agree a target for reducing $PM_{2.5}$ exposure (calculated from PM_{10} exposure / background maps / local monitoring where available)
- To maintain compliance with the 2020 EU limit value of 25µg/m3
- To include Public Health Outcome Framework Indicator 3.01 in the Staffordshire and District
- Authority and City Council Joint Strategic Needs Assessment for 2018/2019 onwards and to report progress to the relevant Health and Wellbeing Boards.
- To continue to identify risks affecting $PM_{2.5}$ which need to be addressed at a national level e.g.

A number of authorities within Staffordshire are receiving applications for STOR (Short Term Operating Reserve) sites to supplement power to the National Electricity Grid at times of peak demand. These sites typically operate during the autumn / winter months and can be high emitters of PM. There is currently a conflict in national policy which is seeking security of energy supply and the drive to reduce anthropogenic $PM_{2.5}$. Recent approaches to DEFRA have revealed a lack of suitable guidance to local authorities and STOR operators.

- To lobby for a suitable damage cost calculation to reflect the cost to society from $PM_{2.5}$ and to support this through local and national planning policies.

3 Air Quality Monitoring Data and Comparison with Air Quality Objectives and National Compliance

3.1 Summary of Monitoring Undertaken

3.1.1 Automatic Monitoring Sites

This section sets out what monitoring has taken place and how it compares with objectives.

East Staffordshire Borough Council undertook automatic (continuous) monitoring at one site in Burton upon Trent during 2017. Table A1 in Appendix A shows the details of the site. National monitoring results are available at https://uk-air.defra.gov.uk/networks/

A new Highways England automatic site has been location in Uttoxeter and although this is not a local authority station, the results will be used to support the detailed assessment of the A50 in Uttoxeter.

Maps showing the location of the monitoring sites are provided in Appendix D. Further details on how the monitors are calibrated and how the data has been adjusted are included in Appendix C.

3.1.2 Non-Automatic Monitoring Sites

East Staffordshire Borough Council undertook non- automatic (passive) monitoring of NO_2 at 90 sites during 2017. Table A.2 in Appendix A shows the details of the sites.

Maps showing the location of the monitoring sites are provided in Appendix D. Further details on Quality Assurance/Quality Control (QA/QC) for the diffusion tubes, including bias adjustments and any other adjustments applied (e.g. “annualisation” and/or distance correction), are included in Appendix C.

3.2 Individual Pollutants

The air quality monitoring results presented in this section are, where relevant, adjusted for bias, “annualisation” and distance correction. Further details on adjustments are provided in Appendix C.

3.2.1 Nitrogen Dioxide (NO_2)

Table A.3 in Appendix A compares the ratified and adjusted monitored NO_2 annual mean concentrations for the past 5 years with the air quality objective of 40µg/m^3.

For diffusion tubes, the full 2017 dataset of monthly mean values is provided in Appendix B.

Table A.4 in Appendix A compares the ratified continuous monitored NO_2 hourly mean concentrations for the past 5 years with the air quality objective of 200µg/m^3, not to be exceeded more than 18 times per year.

Graphical representations of the monitored NO_2 annual mean concentrations since 2006 are shown in Figure A1, A2 and A3 in Appendix A.

Burton upon Trent

Within AQMA 1 there are still exceedances of the 40µg/m^3 annual objective at certain locations. There is a long-term reduction in NO_2 concentrations throughout AQMA 1 although 2016 and 2017 shows a short-term upward spike in concentrations, although these values are still significantly lower than the concentrations at the beginning of the monitoring study. Short-term trends are difficult to interpret due to the affect that weather has over this period of time and should be assessed with caution.

No new locations outside of the AQMAs have NO_2 concentrations in exceedance of the 40µg/m^3 annual objective.

No monitored locations exceed 60µg/m^3 for NO_2 which can be indicative of potential hourly objective exceedances.

NO_2 monitoring in AQMA 2 remains below the annual 40µg/m^3 annual objective but is still too close to the limit for consideration of a decision to undeclare the AQMA.

Uttoxeter

The Highways England (HE) diffusion tubes located in Uttoxeter show a number of locations in exceedance of the 40µg/m^3 NO_2 annual objective when distance corrected and two breaches greater than 60µg/m^3, which can be indicative of an hourly objective exceedance. Although some of these tubes were representative of commercial location and therefore the 40µg/m^3 annual limit is not applicable, some locations are residential.

The Defra distance correction tool is considered conservative and on the basis of the monitoring, additional local authority diffusion tubes were located at 19 façade locations representative of receptors towards the end of 2017. This included some tubes located in triplicate at some of the locations. Data from these tubes will be far more accurate in identifying objective exceedances.

Highways England also installed an automatic monitoring station at a roadside location where three of the above diffusion tubes we also located in triplicate.

Complete data from this site and the façade diffusion tubes is not included in this report but will be available in the 2018 ASR.

3.2.2 Particulate Matter (PM_{10})

East Staffordshire Borough Council no longer monitors for PM_{10}.

3.2.3 Particulate Matter ($PM_{2.5}$)

East Staffordshire Borough Council does not monitor for $PM_{2.5}$

3.2.4 Sulphur Dioxide (SO_2)

East Staffordshire Borough Council does not monitor for SO_2.

Appendix A: Monitoring Results

Table A.1 – Details of Automatic Monitoring Sites

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Monitoring Technique	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Inlet Height (m)
CM1	Derby Turn	Roadside	424671	324019	NO_2	Yes	Chemiluminescent	8.2	5	1.8
CM2	Uttoxeter	Roadside	408521	334694	NO_2	No	Chemiluminescent	9.5	3.25	1.8

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.2 – Details of Non-Automatic Monitoring Sites

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Distance to Relevant Exposure (m) [1]	Distance to kerb of nearest road (m) [2]	Tube collocated with a Continuous Analyser?
DT1	Trent Bridge	Roadside	425362	323339	NO_2	Y	<0.5	2.1	N
DT2	St Peters Bridge	Roadside	425575	322028	NO_2	Y	6.5	3.0	N
DT3	Horninglow Croft	Roadside	424367	324781	NO_2	N	2.2	1.6	N
DT4[5]	Derby Turn Monitoring Station	Roadside	424671	324019	NO_2	Y	8.2	5	Y
DT5[5]	Derby Turn Monitoring Station	Roadside	424671	324019	NO_2	Y	8.2	5	Y
DT6[5]	Derby Turn Monitoring Station	Roadside	424671	324019	NO_2	Y	8.2	5	Y
DT7	Wellington St	Kerbside	423952	323281	NO_2	Y	1.7	0.5	N
DT8	Horninglow St	Roadside	424796	323624	NO_2	Y	2	2.7	N
DT9									
DT10	Derby Turn	Kerbside	424636	324037	NO_2	Y	3.2	<0.5	N
DT11	Brookside-Winshill	Urban background	426742	324155	NO_2	N	N/A	N/A	N
DT12	A38 slip road (3)	Roadside	421135	319527	NO_2	N	18.5	3.5	N
DT13	Horninglow Rd-Shakespeare Rd Junction	Roadside	424416	324483	NO_2	Y	2.8	1.8	N
DT14	Horninglow Rd-opp Morris Homes	Roadside	424537	324228	NO_2	Y	1	4.5	N
DT15	Derby St-near to Derby Turn	Roadside	424581	323963	NO_2	Y	0.5	1.8	N
DT16	Horninglow Rd North-appr Morleys Hill junction	Roadside	423990	325224	NO_2	Y	3.1	1.2	N
DT17	Derby St/Byrkley St Junction	Roadside	424212	323473	NO_2	Y	3.8	1.7	N

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube collocated with a Continuous Analyser?
DT18	A444-Stapenhill appr Voilet Way	Roadside	425706	321902	NO_2	Y	3.2	1.5	N
DT19	Princess Way Roundabout	Roadside	425235	324854	NO_2	Y	10.3	1.8	N
DT20	Derby Rd appr Princess Way roundabout	Roadside	425161	324737	NO_2	Y	5.7	4	N
DT21	Derby St/Eton Rd junction	Roadside	425107	324668	NO2	Y	2.9	2.4	N
DT22	Derby Rd/ appr Derby Turn	Roadside	424708	324140	NO2	Y	6	3.2	N
DT23	Derby St appr Derby Turn	Roadside	424547	323940	NO2	Y	3.4	2	N
DT24	Derby St-Maltings Court	Roadside	424351	323660	NO2	Y	2.8	2.3	N
DT25	Derby St appr Little Burton West	Roadside	424453	323794	NO2	Y	7	3	N
DT26	Waterloo St/Byrkley St corner	Roadside	424129	323505	NO2	Y	0.5	4.1	N
DT27	Derby St/Borough Rd junction	Kerbside	424149	323344	NO2	Y	2.9	<0.5	N
DT28	Wellington St- crossing	Kerbside	423993	323308	NO2	Y	2	<0.5	N
DT29	Wellington St roundabout	Roadside	423812	323077	NO2	Y	12.9	2.5	N
DT30	Wellington St- appr roundabout	Roadside	423807	323115	NO_2	Y	<0.5	1.9	N
DT31	Wellington St/Shobnall Rd roundabout	Roadside	423784	323099	NO_2	Y	8.7	2.8	N
DT32	Rolleston Rd- near junction Horninglow Rd	Roadside	424113	325209	NO_2	Y	6	1.4	N
DT33	Horninglow St/Guild St Corner	Roadside	424984	323388	NO_2	Y	1.3	1.5	N
DT34	Horninglow St- near junction Wetmore Rd	Roadside	425270	323346	NO_2	Y	0.6	3.5	N

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Distance to Relevant Exposure (m) [1]	Distance to kerb of nearest road (m) [2]	Tube collocated with a Continuous Analyser?
DT35	Horninglow St- near junction High St	Roadside	425275	323327	NO_2	Y	<0.5	2.7	N
DT36	Bridge St- near Old Bridge	Roadside	425345	323321	NO_2	Y	0.5	2.6	N
DT37	Anglesey Rd/Evershed Way corner	Roadside	424096	322774	NO_2	N	2.2	1.9	N
DT38	Orchard Street- Caxton Court	Roadside	424559	322376	NO_2	N	6	2.7	N
DT39	Branston Rd/St Peters Bridge roundabout	Roadside	424648	322300	NO_2	N	9.1	3.2	N
DT40	Grange St/Shobnall Rd junction	Roadside	423611	323176	NO_2	N	7.6	2.9	N
DT41	Shobnall Rd- near Marstons	Roadside	423264	323358	NO_2	N	3.8	1.5	N
DT42	Forest Rd	Roadside	422129	323906	NO_2	N	2.1	1	N
DT43	Hawkins Ln	Roadside	424969	323802	NO_2	N	1.7	1.5	N
DT44	A50 Uttoxeter	Roadside	408410	334680	NO_2	N	7.9	4.7	N
DT45	A50 near roundabout northbound- Uttoxeter	Roadside	408609	334703	NO_2	N	12.5	5.5	N
DT50	A50 appr New Rd junction- Uttoxeter	Roadside	408273	334667	NO_2	N	9	2	N
DT51	A50 near roundabout southbound- Uttoxeter	Roadside	408875	334744	NO_2	N	8.5	3	N
DT52	Badgery Close-Uttoxeter	Roadside	408415	334622	NO_2	N	12	63	N
HE1	A50/Derby Rd roundabout	Roadside	410081	334425	NO_2	N	165	4	N
HE2									
HE3	A50 residential 1	Roadside	408872	334743	NO_2	N	8	3	N
HE4	A50 filling station	Roadside	408795	334744	NO_2	N	62	2.5	N
HE5	A50 commercial	Roadside	408600	334703	NO_2	N	6	6.5	N

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube collocated with a Continuous Analyser?
HE6	A50 residential 2	Roadside	408409	334683	NO_2	N	14	4.2	N
HE7	Badgery Close	Roadside	408415	334622	NO_2	N	5	N/A	N
HE8									
HE9	Greenacres Drive	Roadside	408440	334600	NO_2	N	6	N/A	N
HE10	Ashbourne Rd	Roadside	408682	334452	NO_2	N	13	N/A	N
HE11	Spath	Roadside	408640	334893	NO_2	N	100	N/A	N
HE12	Ashbourne Rd/Park St	Roadside	408693	334652	NO_2	N	13	2.5 (Ashbourne Rd)	N
HE13	Granville Close	Roadside	407508	334219	NO_2	N	6	N/A	N
HE14	New Road	Roadside	408563	334383	NO_2	N	14		
HE15	A50/Ashbourne Rd	Roadside	408776	334719	NO_2	N	37	4	N
HE16	Stanley Crescent	Roadside	408605	334620	NO_2	N	6	N/A	N
HE17	A50 approaching filling station	Roadside	408128	334652	NO_2	N	25	5	N
HE18	A522 slip Road	Roadside	407969	334647	NO_2	N	100	2.4	N
HE19	A50 Blythe Bridge	Roadside	396261	340511	NO_2	N	65	2.5	N
HE20	A50 River Dove	Roadside	410492	334397	NO_2	N	120	3.2	N
HE21	A50/Spath	Roadside	408670	334800	NO_2	N	36	3.5	N
HE22	The Meadows	Roadside	408151	334596	NO_2	N	5	N/A	N
HE23	A50 roadside verge	Roadside	408236	334663	NO_2	N	37	1.9	N

Notes:

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

(2) N/A if not applicable.

Table A.3 – Annual Mean NO_2 Monitoring Results

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2017 (%) [2]	NO_2 Annual Mean Concentration (µg/m^3) [3]				
					2013	2014	2015	2016	2017
CM1	Urban Centre	Automatic	97.7	97.7	29	36	39	**51**	**46**
DT1	Roadside	Diffusion Tube	100	100	30.3	33.7	34	33.9	38.9
DT2	Roadside	Diffusion Tube	100	100	**40**	37.2	39.1	38	39
DT3	Roadside	Diffusion Tube	100	100	22.8	31.6	30.8	31.4	32.5
DT4	Urban Centre	Diffusion Tube	100	100	38.9	**41.2**	**42.2**	37.1	38.8
DT5	Urban Centre	Diffusion Tube	100	100	38.9	**41.2**	**42.2**	37.1	38.8
DT6	Urban Centre	Diffusion Tube	100	100	38.9	**41.2**	**42.2**	37.1	38.8
DT7	Kerbside	Diffusion Tube	92	92	35	36.8	37.5	37.7	**40.2**
DT8	Roadside	Diffusion Tube	100	100	35.1	35.6	36.8	37.8	**40.1**
DT10	Urban Background	Diffusion Tube	100	100	**44**	**48.5**	**46.8**	31.6	**43.9**
DT11	Roadside	Diffusion Tube	92	92	16.9	14.8	15	15	17
DT12	Roadside	Diffusion Tube	100	100	28.4	29.3	26.5	28.5	26.1
DT13	Roadside	Diffusion Tube	100	100	34.7	34.4	36.6	36.4	36.2
DT14	Roadside	Diffusion Tube	100	100	28.6	31.5	32	31.7	32.3
DT15	Roadside	Diffusion Tube	100	100	**44.7**	**44**	**43.5**	**46.9**	**46.4**
DT16	Roadside	Diffusion Tube	100	100	25.3	26.7	24.3	25.4	26.3
DT17	Roadside	Diffusion Tube	100	100	**43.9**	**42.9**	**42.4**	**45**	**47.1**
DT18	Roadside	Diffusion Tube	100	100	35.8	36.5	34.2	36	35
DT19	Roadside	Diffusion Tube	92	92	27.6	28.9	28.6	30.7	28
DT20	Roadside	Diffusion Tube	92	92	29.9	31.8	30.2	30.5	31.4
DT21	Roadside	Diffusion Tube	92	92	30.7	32.2	32.5	32.7	33.7

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2017 (%) [2]	NO_2 Annual Mean Concentration (µg/m^3) [3]				
					2013	2014	2015	2016	2017
DT22	Roadside	Diffusion Tube	100	100	32.1	33.7	33.9	34.3	37.4
DT23	Roadside	Diffusion Tube	100	100	**40.5**	37.7	37.1	39.4	**40.4**
DT24	Roadside	Diffusion Tube	100	100	**40.1**	37	36.2	38.1	39.8
DT25	Roadside	Diffusion Tube	100	100	38.9	33.3	32.4	33.6	32.9
DT26	Kerbside	Diffusion Tube	92	92	39	38.4	36.3	39.3	**40.6**
DT27	Kerbside	Diffusion Tube	100	100	**44**	**45**	38.4	36.3	**42**
DT28	Roadside	Diffusion Tube	83	83	**44.7**	**44.3**	**45.1**	**44.9**	**47**
DT29	Roadside	Diffusion Tube	100	100	31.4	36.3	29.7	29	32.1
DT30	Roadside	Diffusion Tube	100	100	39.4	**41.7**	**40.8**	**40.4**	**41.6**
DT31	Roadside	Diffusion Tube	100	100	32.9	35.8	34.6	33.5	36.7
DT32	Roadside	Diffusion Tube	100	100	29.3	28.7	28.4	28.9	29.4
DT33	Roadside	Diffusion Tube	100	100	38.7	**41.1**	38.5	39	**44.5**
DT34	Roadside	Diffusion Tube	92	92	31.7	36	37.4	38.4	**40.5**
DT35	Roadside	Diffusion Tube	100	100	**41.2**	**42.4**	37.4	**41.1**	**46.6**
DT36	Roadside	Diffusion Tube	42	42	31.6	33.6	32.8	36.6	Discontinued
DT37	Roadside	Diffusion Tube	83	83	35.8	33.1	31.8	33.7	34.7
DT38	Roadside	Diffusion Tube	33	33	35.4	31	30.5	30.8	28.9
DT39	Roadside	Diffusion Tube	100	100	34.4	30.4	32.4	30.5	31.8
DT40	Roadside	Diffusion Tube	92	92	30.9	27.7	29.1	31.8	32.3
DT41	Roadside	Diffusion Tube	100	100	27.6	31	28.9	34.4	32.3
DT42	Roadside	Diffusion Tube	92	92	24.4	25.2	26	26.7	32.9

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2017 (%) [2]	NO_2 Annual Mean Concentration (µg/m^3) [3]				
					2013	2014	2015	2016	2017
DT43	Roadside	Diffusion Tube	100	100	31.4	32.5	34.4	32.8	32.9
DT44	Roadside	Diffusion Tube	100	100			**80**	**82**	**67.7**
DT49	Roadside	Diffusion Tube	100	100				**54.1**	**48.4**
DT50	Roadside	Diffusion Tube	25	25				**63.5**	Discontinued
DT51	Roadside	Diffusion Tube	100	100				**58.8**	**63.5**
DT52	Roadside	Diffusion Tube	100	100				25.2	22.7
HE01	Roadside	Diffusion Tube	58	58					35.8
HE02	Roadside	Diffusion Tube	N/A	N/A	N/A	N/A	N/A	N/A	N/A
HE03	Roadside	Diffusion Tube	67	67					**60.5**
HE04	Roadside	Diffusion Tube	67	67					**49**
HE05	Roadside	Diffusion Tube	67	67					**59.6**
HE06	Roadside	Diffusion Tube	67	67					**51.3**
HE07	Roadside	Diffusion Tube	67	67					18.1
HE08	Roadside	Diffusion Tube	N/A	N/A	N/A	N/A	N/A	N/A	N/A
HE09	Roadside	Diffusion Tube	67	67					17.3
HE10	Roadside	Diffusion Tube	67	67					19
HE11	Roadside	Diffusion Tube	67	67					12.9
HE12	Roadside	Diffusion Tube	67	67					21.9
HE13	Roadside	Diffusion Tube	67	67					12.3
HE14	Roadside	Diffusion Tube	67	67					17.4
HE15	Roadside	Diffusion Tube	67	67					23

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2017 (%) (2)	NO_2 Annual Mean Concentration (µg/m^3) (3)				
					2013	2014	2015	2016	2017
HE16	Roadside	Diffusion Tube	67	67					18.6
HE17	Roadside	Diffusion Tube	67	67					29.9
HE18	Roadside	Diffusion Tube	58	58					36.5
HE19	Roadside	Diffusion Tube	58	58					**60.9**
HE20	Roadside	Diffusion Tube	66	66					**45.5**
HE21	Roadside	Diffusion Tube	58	58					31.8
HE22	Roadside	Diffusion Tube	66	66					20.3
HE23	Roadside	Diffusion Tube	66	66					30.4
HE24	Roadside	Diffusion Tube	42	42					33.8
HE25	Roadside	Diffusion Tube	42	42					30
HE26	Roadside	Diffusion Tube	42	42					32.9
HE27	Roadside	Diffusion Tube	25	25					N/A
HE28	Roadside	Diffusion Tube	25	25					N/A
HE29	Roadside	Diffusion Tube	25	25					N/A

☒ **Diffusion tube data has been bias corrected**

☒ **Annualisation has been conducted where data capture is <75%**

Notes:

Exceedances of the NO_2 annual mean objective of 40µg/m^3 are shown in **bold**.

NO_2 annual means exceeding 60µg/m^3, indicating a potential exceedance of the NO_2 1-hour mean objective are shown in **bold and underlined.**

(1) Data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

(2) Data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

(3) Means for diffusion tubes have been corrected for bias. All means have been "annualised" as per Boxes 7.9 and 7.10 in LAQM.TG16 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

Figure A. – Trends in Annual Mean NO_2 Concentrations

Figure A.1a – Trends in Annual Mean NO_2 Concentrations- AQMA 1

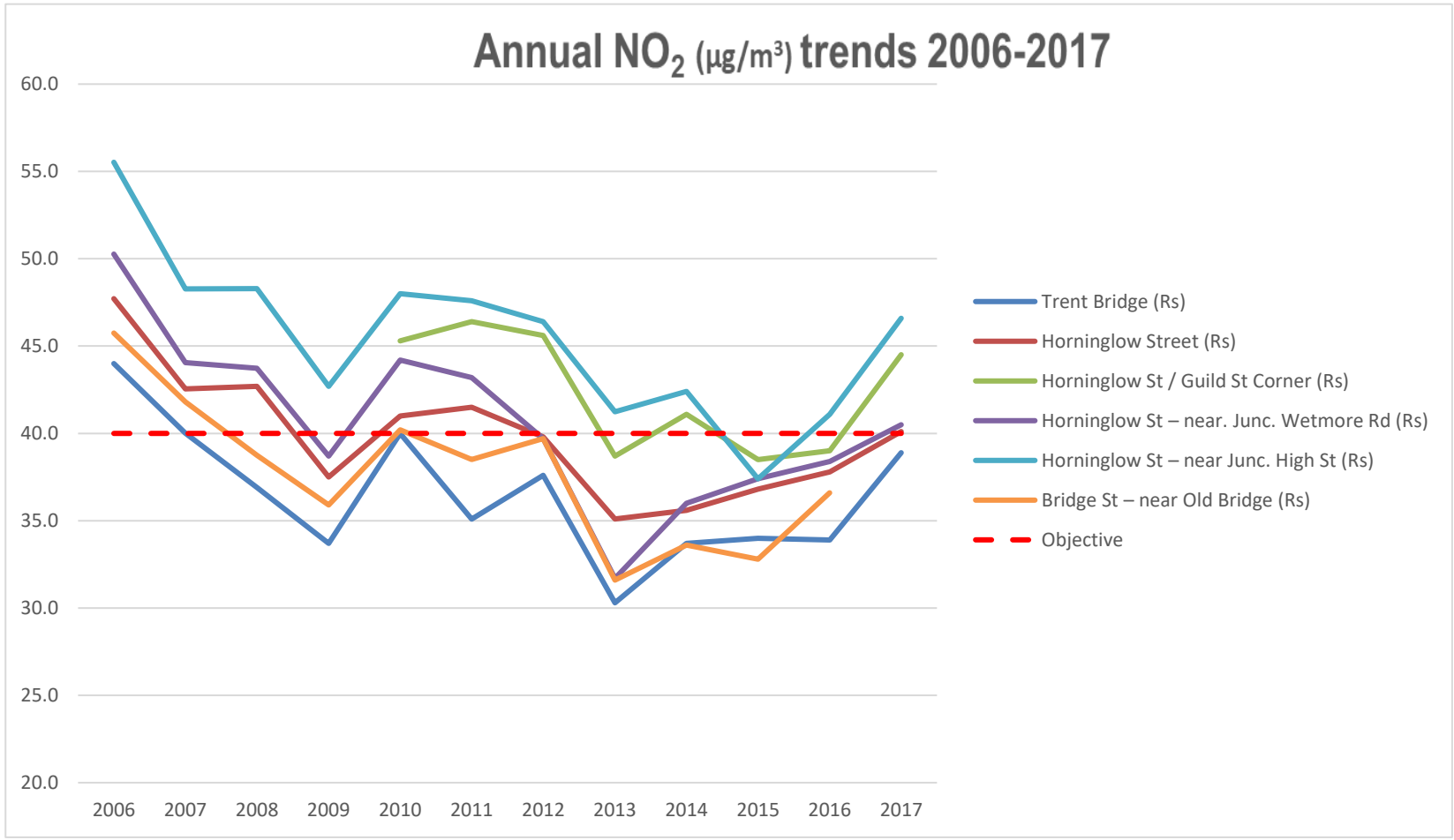

Figure A.2b – Trends in Annual Mean NO_2 Concentrations- AQMA 1 (cont)

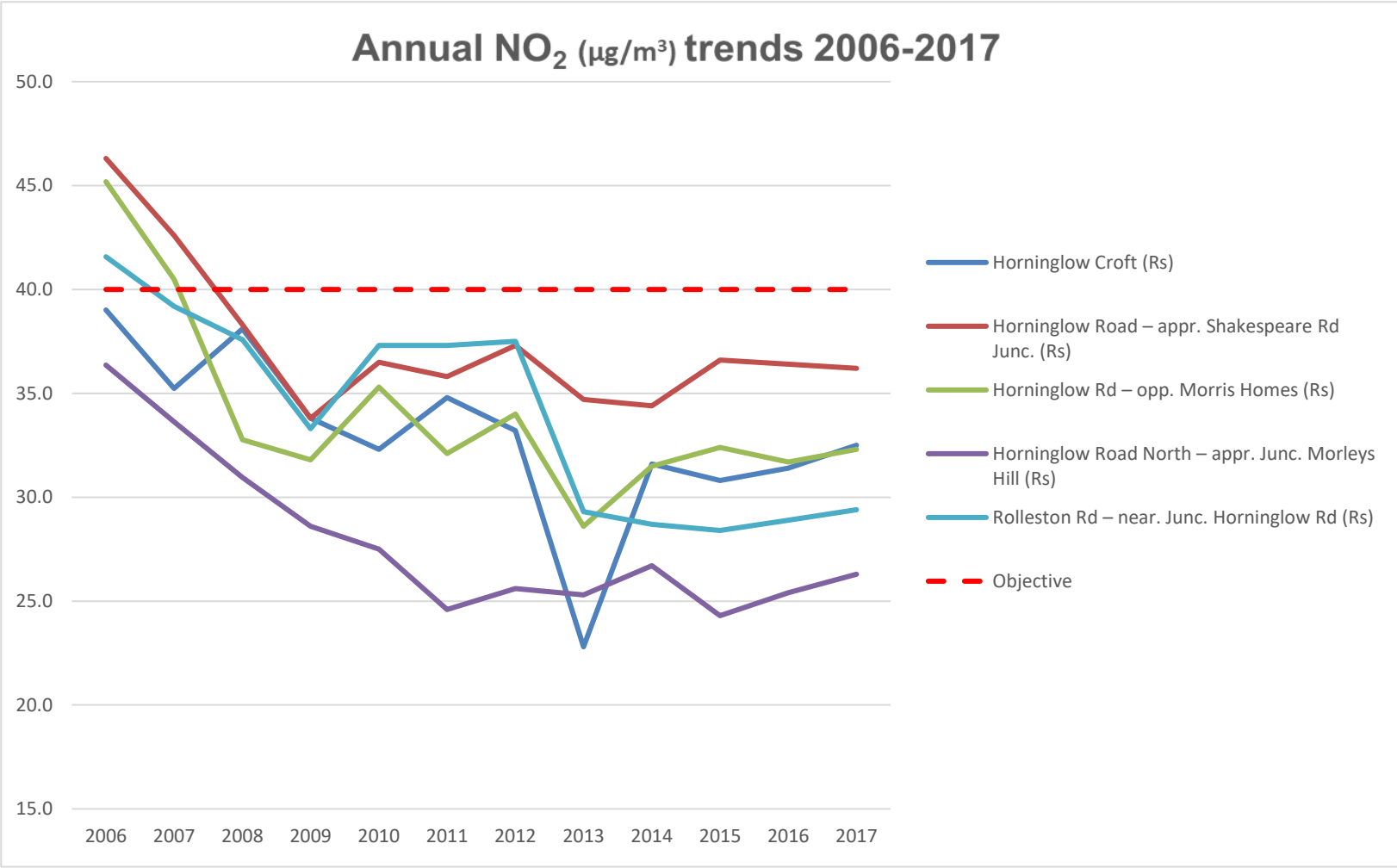

Figure A.3c – Trends in Annual Mean NO_2 Concentrations- AQMA 1 (cont)

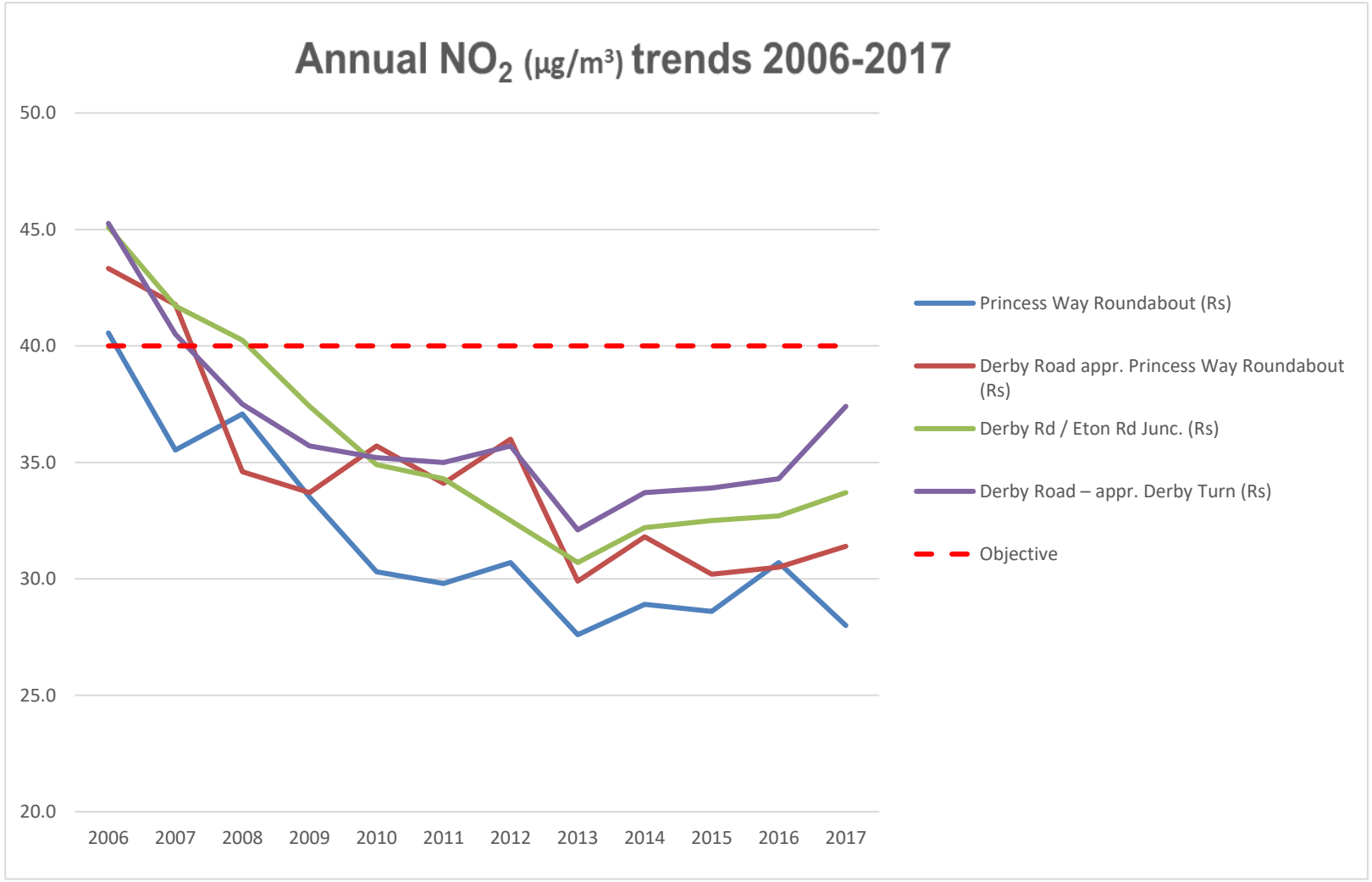

Figure A.4d – Trends in Annual Mean NO_2 Concentrations- AQMA 1 (cont)

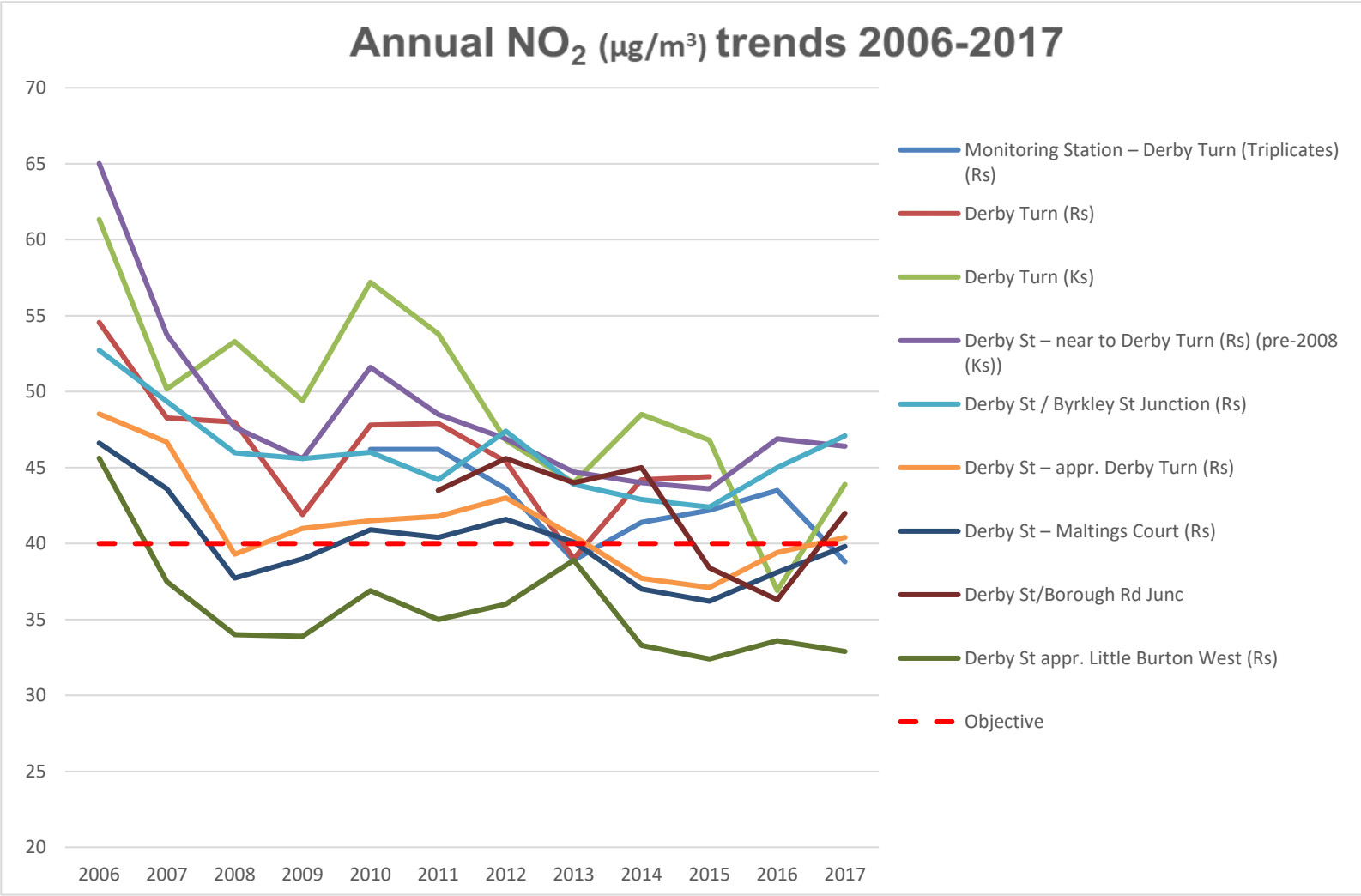

Figure A.5e – Trends in Annual Mean NO_2 Concentrations- AQMA 1 (cont)

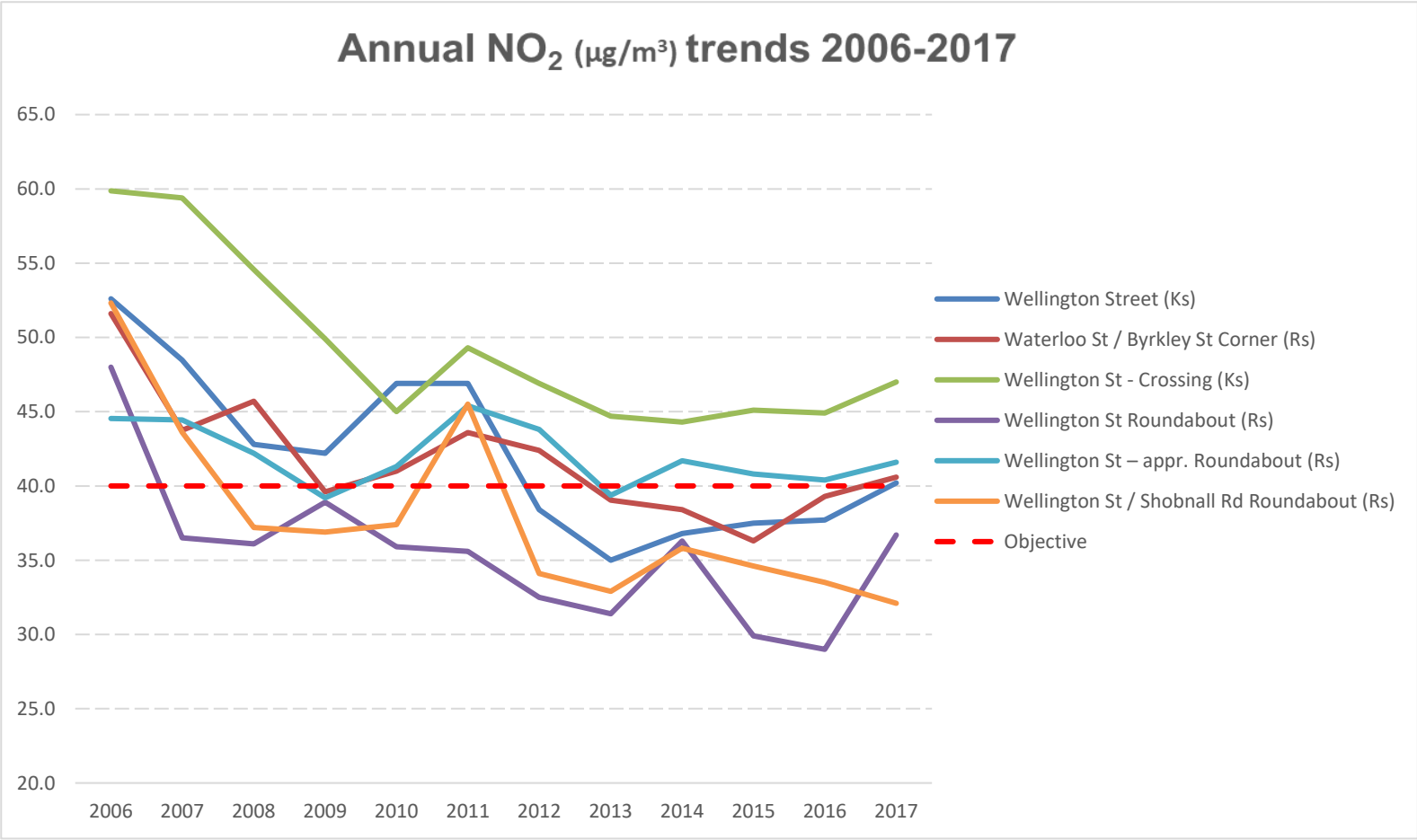

Figure A.6 – Trends in Annual Mean NO_2 Concentrations- AQMA 2

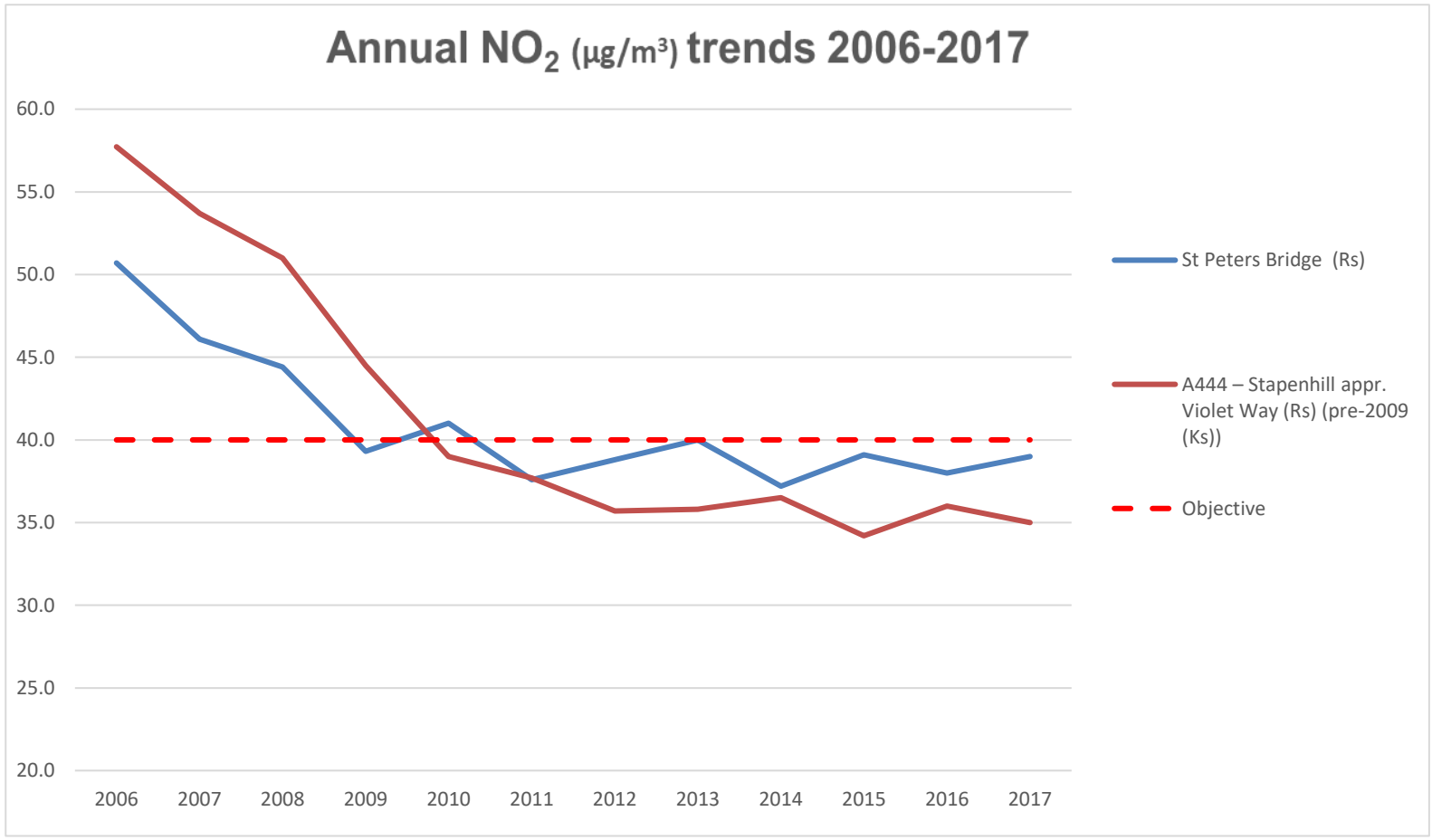

Figure A3 - Trends in Annual Mean NO_2 Concentrations- locations not in AQMAs

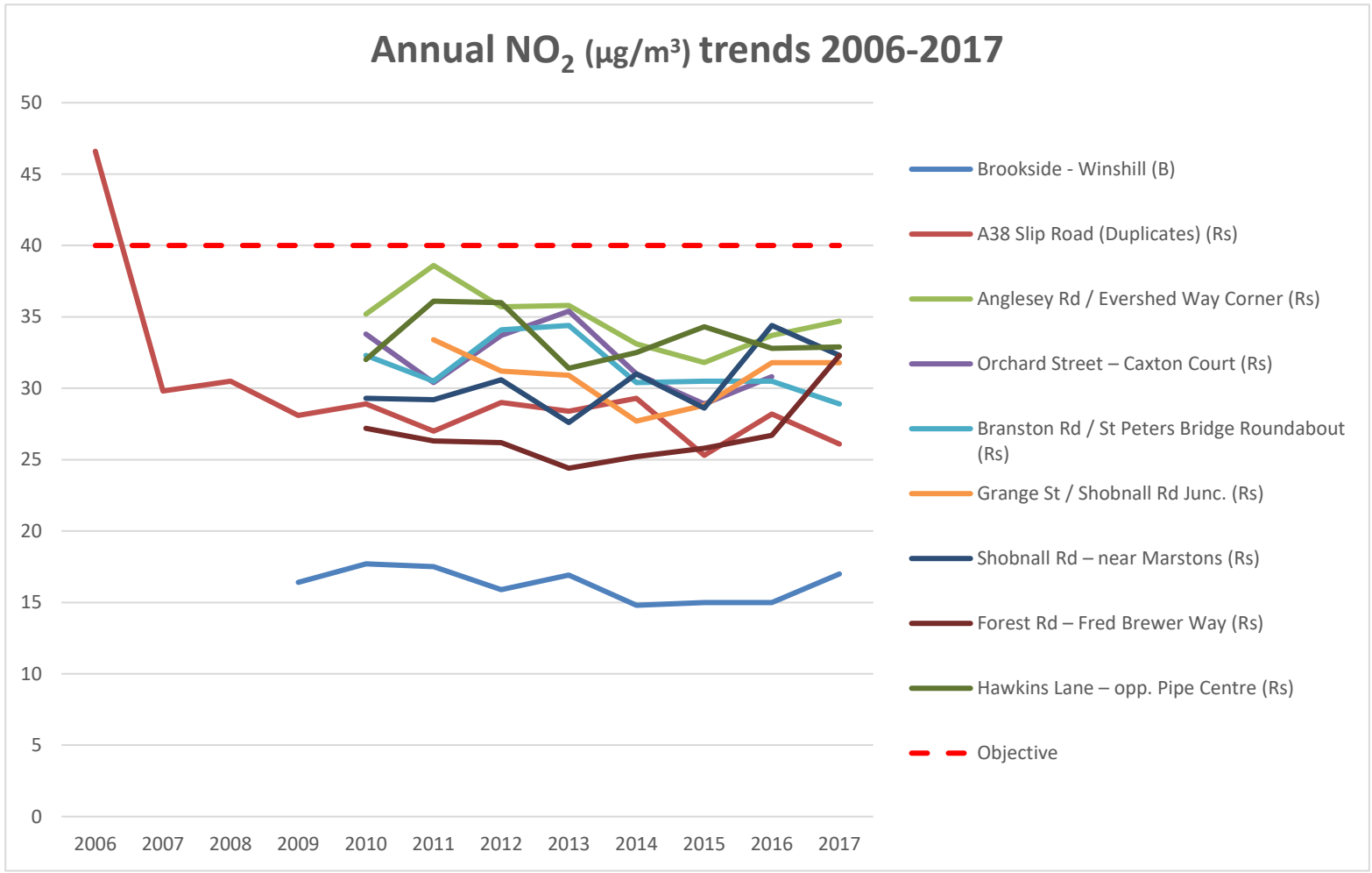

Table A.4 – 1-Hour Mean NO_2 Monitoring Results

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2017 (%) (2)	NO_2 1-Hour Means > 200µg/m^3 (3)				
					2013	2014	2015	2016	2017
CM1	Roadside	Automatic	97.7	97.7	**0**	0	0	0	**4**

Notes:

Exceedances of the NO_2 1-hour mean objective (200µg/m^3 not to be exceeded more than 18 times/year) are shown in **bold.**

(1) Data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

(2) Data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

(3) If the period of valid data is less than 85%, the 99.8th percentile of 1-hour means is provided in brackets.

Appendix B: Full Monthly Diffusion Tube Results for 2017

Table B.1 – NO_2 Monthly Diffusion Tube Results - 2017

Site ID	NO_2 Mean Concentrations (µg/m^3)														
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean		
													Raw Data	Bias Adjusted (factor) and Annualised [1]	Distance Corrected to Nearest Exposure [2]
DT1	57.8	42.5	39.0	37.8	34.5	33.3	36.4	40.4	50.9	44.6	50.6	44.1	42.7	**40.1**	38.9
DT2	76.1	57.7	55.9	51.2	56.7	53.7	49.5	48.5	36.6	34.1	69.1	47.0	53.0	**49.8**	39
DT3	54.8	45.4	39.6	28.0	33.1	34.0	31.2	32.9	39.8	37.7	43.1	38.4	38.2	35.9	32.5
DT4	62.1	52.6	47.8	43.2	42.1	44.6	48.5	49.6	53.3	50.1	57.1	48.8	50.0	**47.0**	38.7
DT5	67.3	53.1	50.6	45.9	40.0	46.0	46.4	40.4	56.2	50.7	57.1	48.0	50.1	**47.1**	38.8
DT6	65.7	53.9	45.6	35.7	38.9	47.4	45.2	46.8	54.7	53.3	63.9	53.0	50.3	**47.3**	39
DT7	65.2	57.2	48.3	41.4	47.7	45.7	I/S	47.2	53.1	50.4	65.0	48.8	51.8	**48.7**	**40.2**
DT8	60.7	49.6	50.4	40.7	50.4	40.4	39.4	38.3	47.2	43.1	45.7	41.2	45.6	**43**	**40.1**
DT10	78.3	67.5	64.8	53.9	50.4	59.9	55.7	51.7	64.4	62.5	68.7	60.1	61.5	**57.8**	**43.9**
DT11	32.1	21.7	18.3	10.8	11.9	12.4	I/S	12.3	16.1	18.0	23.4	24.9	18.4	17.3	17
DT12	56.0	50.4	39.1	28.6	41.3	32.1	33.8	29.3	36.7	35.5	38.7	37.6	38.3	36.0	26.1
DT13	63.7	48.4	41.3	35.1	44.7	34.0	44.6	35.5	46.1	37.9	48.9	42.8	43.6	**41.0**	36.2
DT14	57.6	36.8	36.4	28.0	29.9	27.6	28.2	31.2	38.3	38.2	35.2	35.2	35.2	33.1	32.3
DT15	69.3	58.6	57.7	36.9	54.9	47.8	46.0	40.9	53.2	49.3	49.5	46.4	50.9	**47.8**	**46.4**
DT16	49.2	36.2	33.8	24.0	28.8	29.8	27.9	28.2	35.5	33.0	42.2	33.1	33.5	31.5	26.3

Site ID	NO_2 Mean Concentrations (µg/m^3)														
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean		
													Raw Data	Bias Adjusted (factor) and Annualised [1]	Distance Corrected to Nearest Exposure ([2])
DT17	76.6	63.4	62.6	48.8	59.9	54.5	51.4	53.0	63.5	58.9	62.0	55.9	59.2	**55.7**	**47.1**
DT18	55.9	49.5	44.7	37.3	45.5	41.6	45.1	44.9	42.6	38.8	53.1	45.6	45.4	**42.7**	35
DT19	56.8	51.1	39.9	24.8	I/S	32.9	32.9	32.0	40.2	34.7	37.8	39.2	38.4	36.1	28
DT20	55.0	44.9	40.4	26.6	I/S	32.4	29.8	31.8	38.5	39.7	39.7	42.8	38.3	36.0	31.4
DT21	48.5	44.3	38.8	30.2	I/S	34.3	32.7	33.1	39.5	42.4	49.2	46.9	40.0	37.6	33.7
DT22	67.0	51.1	49.5	33.9	40.4	42.1	40.3	41.5	46.9	48.6	57.8	54.9	47.8	**45.0**	37.4
DT23	65.8	54.1	44.6	41.8	40.9	44.4	38.4	45.6	53.0	47.7	55.1	50.3	48.5	**45.6**	**40.4**
DT24	62.1	54.3	48.9	28.8	41.7	42.8	41.7	40.9	52.1	47.1	50.3	48.0	46.6	**43.8**	39.8
DT25	63.9	45.5	45.5	26.0	37.3	32.7	32.5	31.1	35.9	37.4	46.7	43.4	39.8	37.4	32.9
DT26	57.3	52.9	I/S	30.8	35.9	38.1	37.5	37.4	45.4	49.7	49.6	47.7	43.8	**41.2**	**40.6**
DT27	72.8	58.9	44.9	46.0	41.6	52.5	49.6	52.7	56.6	57.0	69.2	58.4	55.0	**51.7**	**42**
DT28	64.7	70.9	67.7	47.0	60.9	57.4	I/S	I/S	70.9	66.3	64.4	60.7	63.1	**59.3**	**47**
DT29	67.7	54.3	55.0	38.0	35.4	44.0	41.5	43.7	46.3	48.4	56.2	45.8	48.0	**45.1**	32.1
DT30	61.8	54.1	27.3	36.4	43.4	48.4	45.1	39.4	49.4	46.7	51.1	47.2	45.9	**43.1**	**41.6**
DT31	67.5	57.1	52.7	38.8	47.0	42.9	46.1	42.6	54.9	49.0	57.4	60.7	51.4	**48.3**	36.7
DT32	60.7	43.8	43.9	33.2	31.6	33.7	33.3	30.6	42.4	41.2	44.5	37.6	39.7	37.3	29.4
DT33	66.7	57.9	52.6	35.4	40.6	45.6	39.5	41.8	62.1	62.8	51.6	55.0	51.0	**47.9**	**44.5**
DT34	I/S	49.3	46.3	39.4	44.4	38.3	32.8	39.2	53.2	49.6	50.6	43.8	44.3	**41.6**	**40.5**
DT35	62.8	51.0	55.4	33.2	44.7	50.3	43.3	46.7	59.8	61.0	52.9	52.2	51.1	**48.0**	**46.6**

Site ID	NO_2 Mean Concentrations (µg/m^3)														
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean		
													Raw Data	Bias Adjusted (factor) and Annualised [1]	Distance Corrected to Nearest Exposure ([2])
DT36	54.4	45.1	43.2	31.4	30.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
DT37	I/S	46.7	41.0	40.7	37.8	38.7	40.2	40.1	I/S	36.5	44.0	44.6	41.0	38.6	34.7
DT38	57.4	45.1	41.4	25.3	I/S	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
DT39	37.1	43.8	41.2	34.4	38.6	34.1	34.2	36.7	32.4	32.2	48.0	44.1	38.1	35.8	28.9
DT40	58.6	46.8	46.9	32.3	32.5	36.9	31.8	35.4	38.5	I/S	55.6	47.9	42.1	39.6	31.8
DT41	59.7	46.7	40.0	24.7	35.8	34.8	30.4	35.1	42.2	39.8	50.9	51.2	40.9	38.5	32.3
DT42	50.8	38.6	34.9	20.9	25.1	28.5	28.0	26.1	29.2	32.8	I/S	35.4	31.8	29.9	32.3
DT43	54.5	43.5	41.7	27.7	31.9	30.2	31.1	31.1	37.9	31.5	41.4	42.2	37.1	34.8	32.9
DT44	101.1	94.0	126.5	70.1	106.0	59.4	93.6	91.9	112.8	89.3	90.1	71.2	92.2	**86.6**	**67.7**
DT49	78.8	75.7	73.5	69.5	72.6	66.5	64.5	74.7	72.3	58.6	77.6	68.3	71.1	**66.8**	**48.4**
DT50	66.4	I/S	99.2	78.0	I/S	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
DT51	104.9	96.8	96.8	92.0	91.4	114.5	96.8	95.5	93.4	105.6	101.2	89.3	98.2	**92.3**	**63.5**
DT52	37.5	29.6	11.7	22.9	23.4	18.4	19.1	19.2	25.2	21.1	33.1	28.6	24.2	22.7	22.7
HE1	52.6				46.1	32.2	36.1	34.5	40.3	31.1			39.0	35.8	N/A
HE2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
HE3	108.2	97		79.5		114.7	96.8	84.5	98.9	70.3			93.7	**83.5**	**60.5**
HE4	81.1	97		78.4		76	75.7	70.9	75.8	64.8			77.5	**69.0**	**49.0**
HE5	71.1	75.6		62.5		65.9	60.5	60.2	72.6	68.6			67.1	**59.8**	**59.6**

Site ID	NO_2 Mean Concentrations (µg/m^3)														
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean		
													Raw Data	Bias Adjusted (factor) and Annualised [1]	Distance Corrected to Nearest Exposure ([2])
HE6	114.4	84.4		84.2		80.2	80.3	75.5	106.4	78.5			88.0	**78.3**	**51.3**
HE7	36.7	14.8		21.2		17.7	16.8	19	23.4	20			21.2	19.4	18.1
HE8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
HE9	38.2	11.9		20.8		18.2	16.5	12.8	24.1	20.6			20.4	18.2	17.3
HE10	42.7	12.9		23.4		24.3	23.1	30.4	28.9	26.2			26.5	23.6	19.0
HE11	25.3	13.2		10		9	12.1	12.9	16.7	17.1			14.5	12.9	N/A
HE12	49	18.6		33.6		30.3	29.3	23.5	31.4	30.1			30.7	27.4	21.9
HE13	29.1	10.8		11.8		10.7	11	11.3	12.6	13.4			13.8	12.3	N/A
HE14	41.1	11.1		19.9		19.2	19.2	19.2	23	21.3			21.8	19.4	17.4
HE15	65.8	22.6		53.8		44.2	45.9	43.1	45.9	41.4			45.3	**40.4**	23.0
HE16	39	12.6		26.6		19.8	19.7	19.2	25.7	19.2			22.7	20.2	18.6
HE17	82.5	62.3		59.7		38.7	41.8	43.9	57.3	52.8			54.9	**48.9**	29.9
HE18		42.2		40.7		48.3	27	24.6	37.4	29.5			35.7	36.5	N/A
HE19	68.9	62.2		75.4		75.3	66.5	60.8	73.6				69.0	**60.9**	N/A
HE20	73.6	54.7		56		49.4	40.6	46.8	44.2	43.4			51.1	**45.5**	N/A
HE21		48.6		16.4		31.4	28.4	26.3	34.8	32			31.1	31.8	N/A
HE22	34.2	26		25.1		17.7	18	18.6	23.7	19.1			22.8	20.3	N/A
HE23	83.4	76.4		65.8		68.8	53.8	60.4	68.2	65.8			67.8	**60.4**	30.4
HE24	60.9	55.5		39.2		47.7	39.3						48.5	**41.4**	33.8

Site ID	NO_2 Mean Concentrations (µg/m^3)														
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean		
													Raw Data	Bias Adjusted (factor) and Annualised (1)	Distance Corrected to Nearest Exposure (2)
HE25	57.6	31.8		40.3		44.1	37.7						42.3	36.1	30.0
HE26	63.8	47.7		41.3		44.7	38.3						47.2	**40.2**	32.9
HE27								64.07	57.48	70.65			64.1	**N/A**	**N/A**
HE28								65.46	77.75	28.13			57.1	**N/A**	**N/A**
HE29								69.56	77.63	64.18			70.5	**N/A**	**N/A**

☒ **Local bias adjustment factor used**

☐ **National bias adjustment factor used**

☒ **Annualisation has been conducted where data capture is <75%**

☒ **Where applicable, data has been distance corrected for relevant exposure**

Notes:

Exceedances of the NO_2 annual mean objective of 40µg/m^3 are shown in **bold**.

NO_2 annual means exceeding 60µg/m^3, indicating a potential exceedance of the NO_2 1-hour mean objective are shown in **bold and underlined.**

(1) See Appendix C for details on bias adjustment and annualisation.

(2) Distance corrected to nearest relevant public exposure.

Appendix C: Supporting Technical Information / Air Quality Monitoring Data QA/QC

New sources/receptors

As in previous years a number large housing and commercial developments have been subject to air quality assessments through the planning process in 2017 although no assessment highlighted any new exceedances of the air quality Objectives.

In the case of a number of residential developments in the AQMAs, particularly the smaller sites or where there is “infilling” of a property on an established street then mitigation has been required to protect the occupants from existing poor air quality. This mitigation is normally in in the form of mechanical ventilation as an alternative to having to open windows with an air inlet drawing cleaner air into the property.

QA/QC of monitoring data

Automatic data

ESBC has a contract with a company called Air Quality Data Management (AQDM) for data collection in relation to our automatic monitoring station. AQDM ensures that our data is fully ratified to the standards highlighted in the LAQM TG standards.

East Staffordshire Borough Council also has a service contract with a company called ESU1 Ltd for the maintenance of the monitoring station. We also undertake our own routine calibration.

Diffusion tubes

ESBC NO_2 diffusion tubes are supplied and analysed by Staffordshire Scientific Services. They were prepared by pipetting a 20% solution of TEA in deionised water, where the solution is pipetted onto grids already placed in the end cap.

Staffordshire Scientific Services who provide the tubes also takes part in the AIR/WASP NO_2 Proficiency Testing Scheme.

Diffusion tube performance is also assessed by their precision which is defined as a measure of how well the same result can be consistently reproduced, i.e. how similar the results of duplicate or triplicate tubes are to each other. A summary of precision results for Staffordshire Scientific Services against some other laboratories is available from http://laqm.defra.gov.uk/diffusion-tubes/precision.html. This exercise has shown

consistently good tube precision for diffusion tubes supplied by Staffordshire Scientific Services.

In terms of diffusion tube accuracy the bias correction factor for 2015 was 0.85 for Staffordshire Scientific Services diffusion tubes compared to the local factor of 0.77 from co-location with our automatic monitoring station. The higher factor of 0.85 was used to correct our diffusion tube data as this was the more conservative option.

There was no diffusion tube data where data capture was less than 75% and therefore no correction was required to adjust short data to long-term values.

Where diffusion tubes were not sited at locations representative of receptor locations (i.e. residential properties in the case of the annual NO_2 objective) then the distance correction tool at http://laqm.defra.gov.uk/tools-monitoring-data/no2-falloff.html was used.

The new tubes deployed in the Uttoxeter area are provided through highways England and supplied by Gradko International.

Appendix D: Map(s) of Monitoring Locations and AQMAs

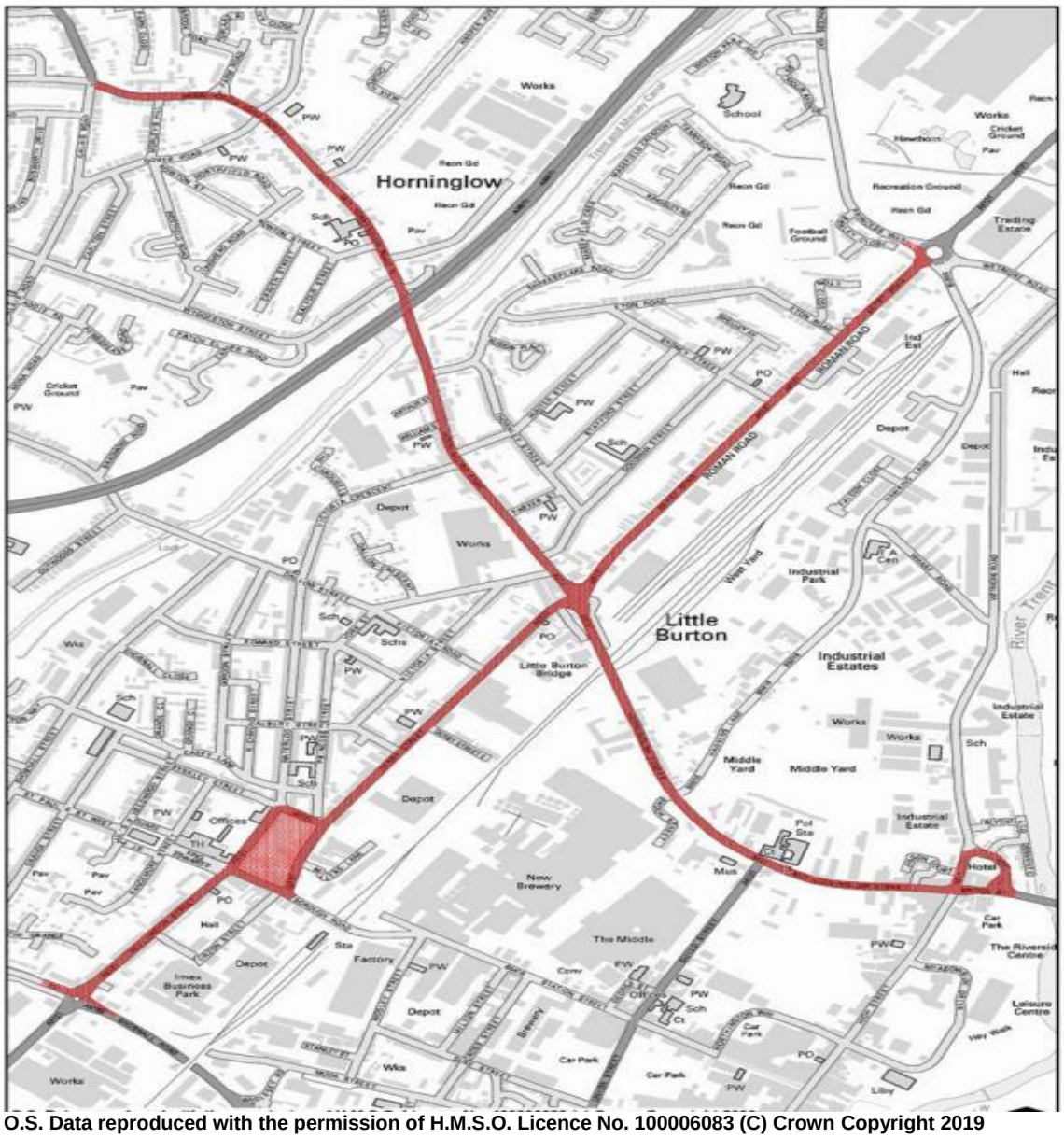

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Figure D1: AQMA 1 Burton upon Trent

Derby Rd, Derby St, part of Princess Way roundabout, Horninglow St, Horninglow Rd, Bridge St, Wellington St, part of Borough Road, part of Wellington St roundabout, part of Waterloo St and part of Byrkley St.

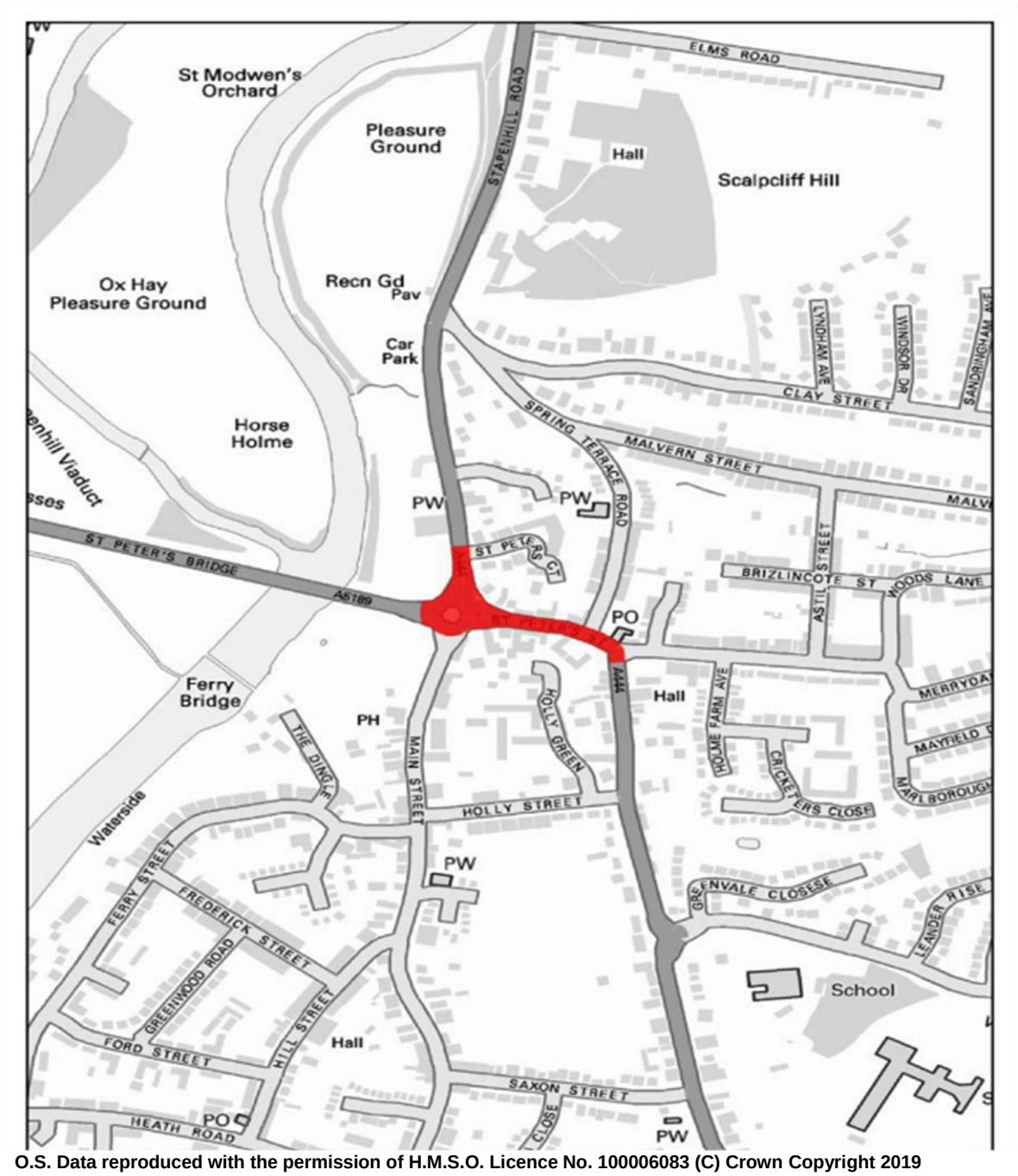

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Figure D2: AQMA 2 St Peters Bridge roundabout

St Peters Bridge roundabout and part of St Peters St, Stapenhill, Burton upon Trent

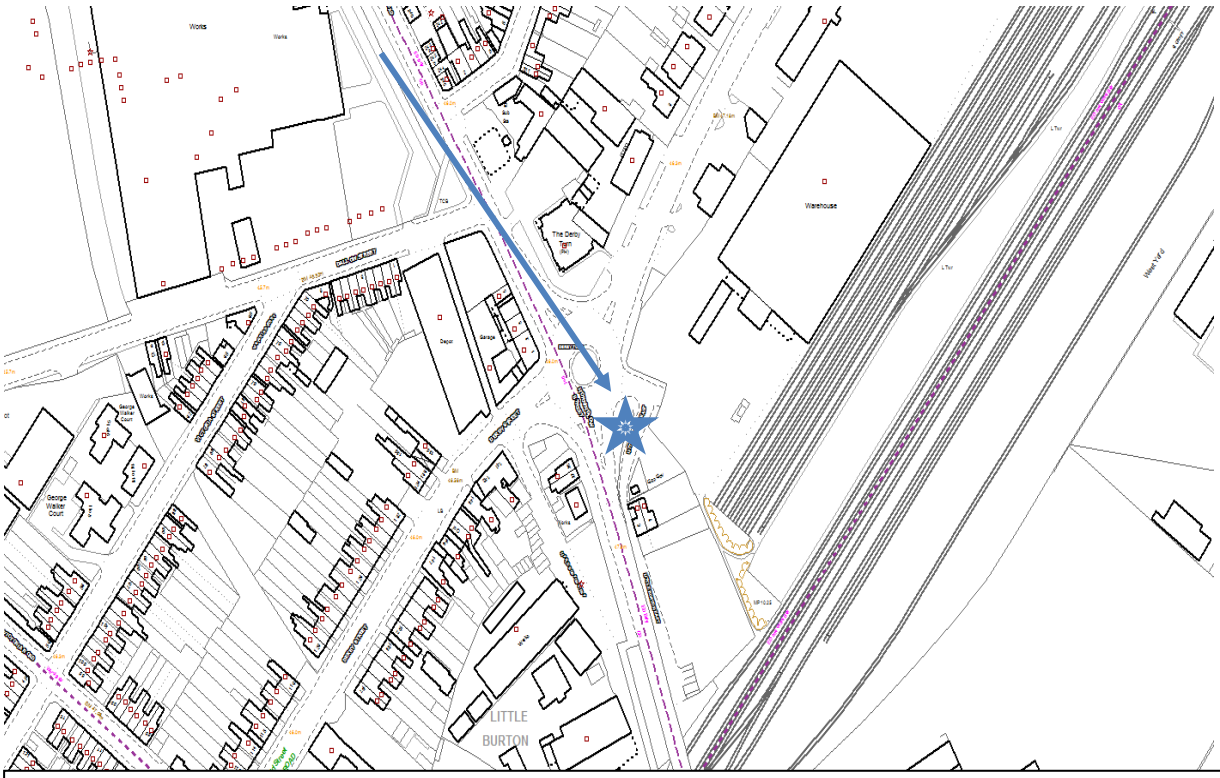

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Figure D3: The automatic monitoring station at Derby Turn, Burton upon Trent

Figure D4 - Diffusion tubes- Burton upon Trent – Hawkins Lane

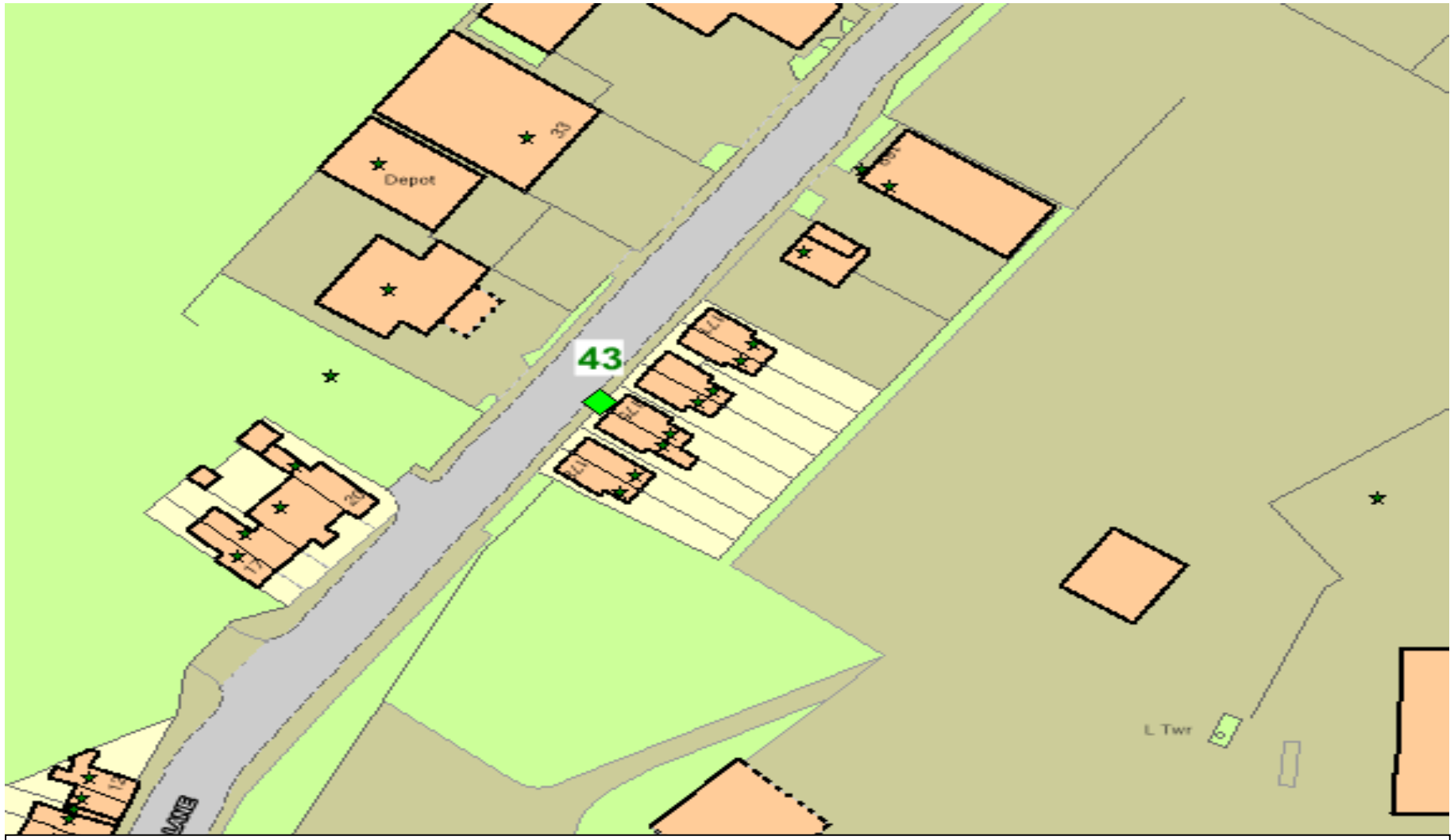

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Figure D5 - Diffusion tubes- Burton upon Trent – Derby Turn

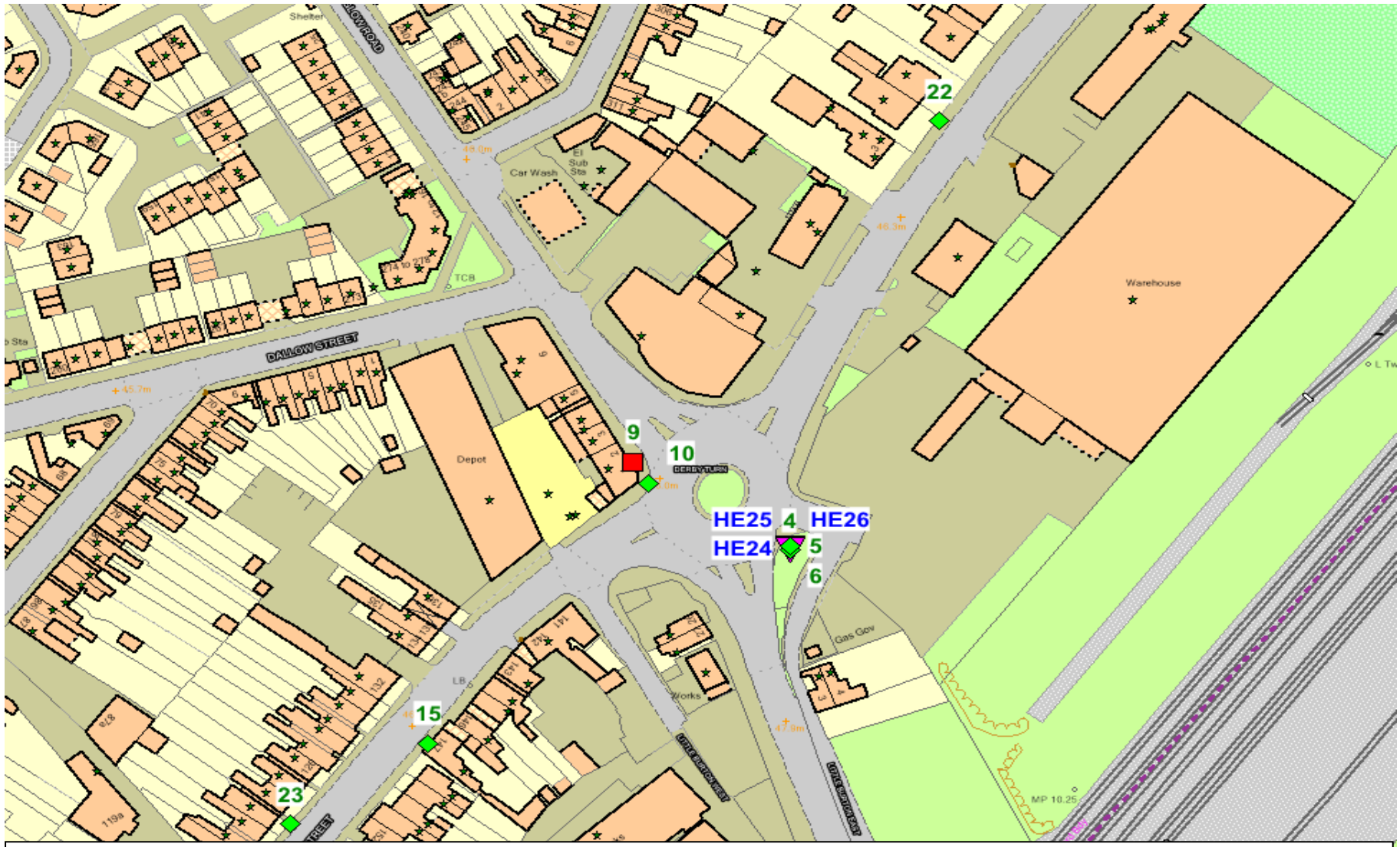

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Figure D6 - Diffusion tubes- Burton upon Trent – Horninglow Road North

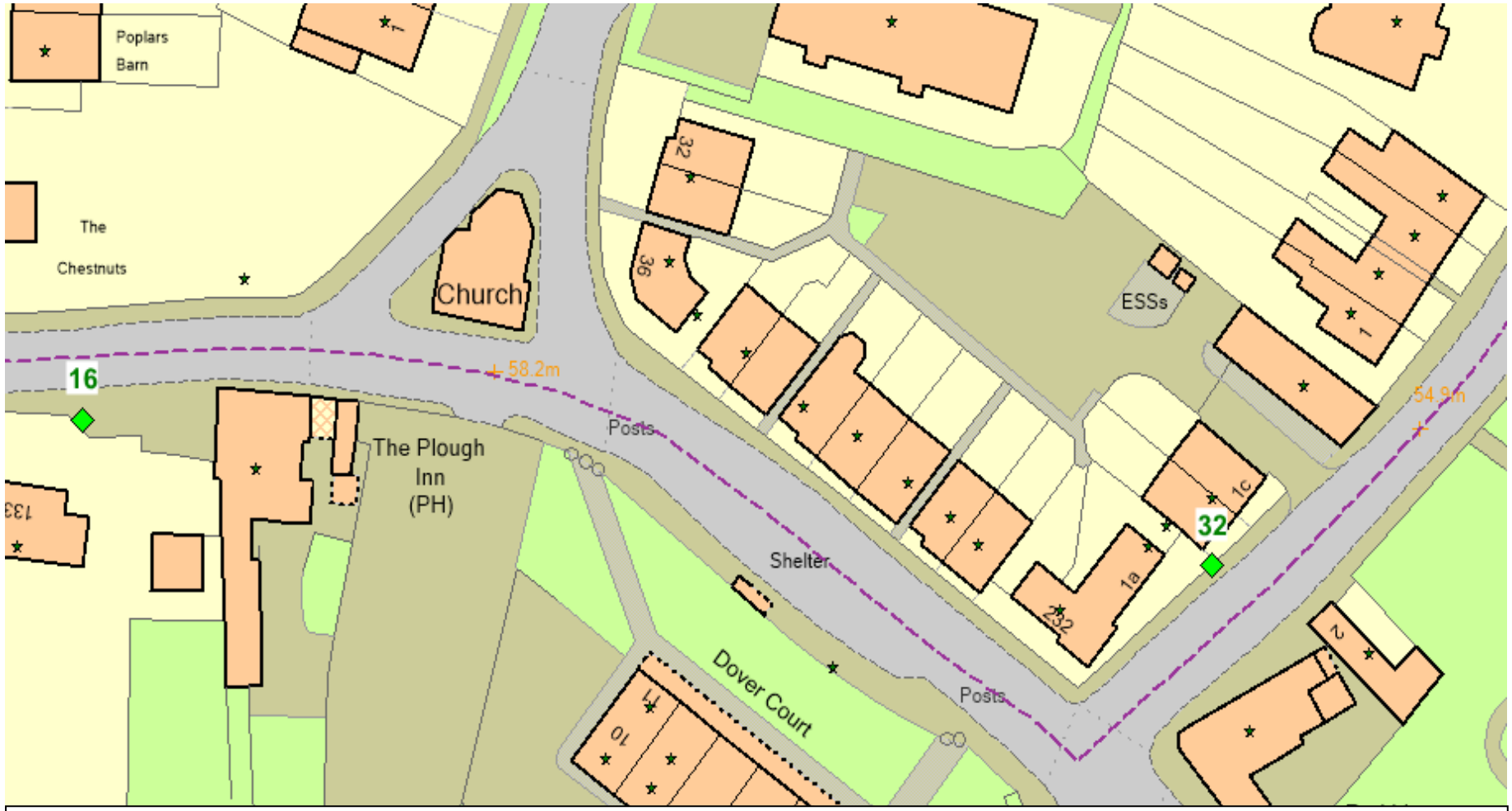

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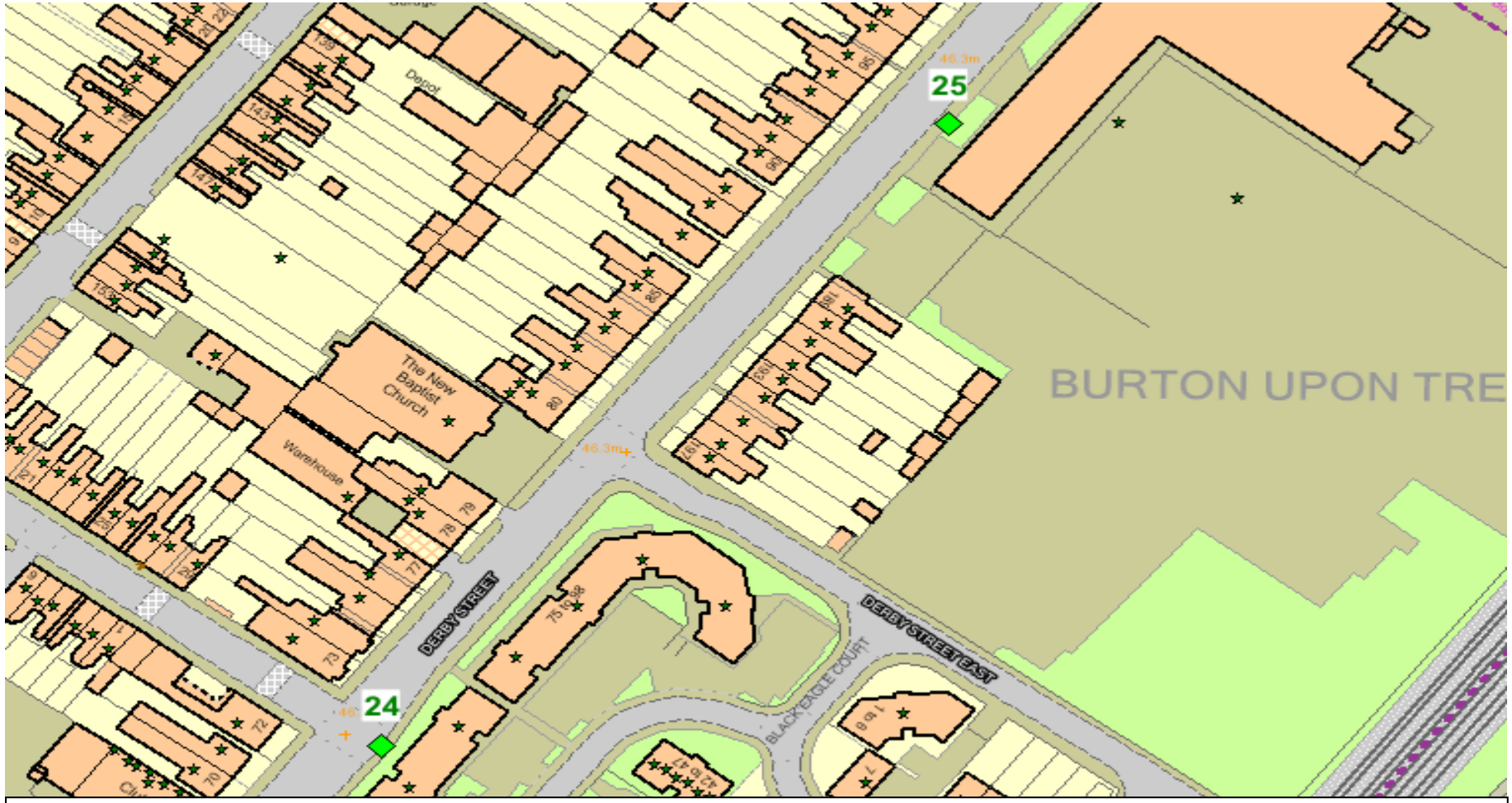
Figure D7 - Diffusion tubes- Burton upon Trent – Derby Road



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Diffusion tube on Derby Street

Figure D8 - Diffusion tubes- Burton upon Trent – Waterloo Street/ Derby Street

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Figure D9 - Diffusion tubes- Burton upon Trent – Anglesey Road

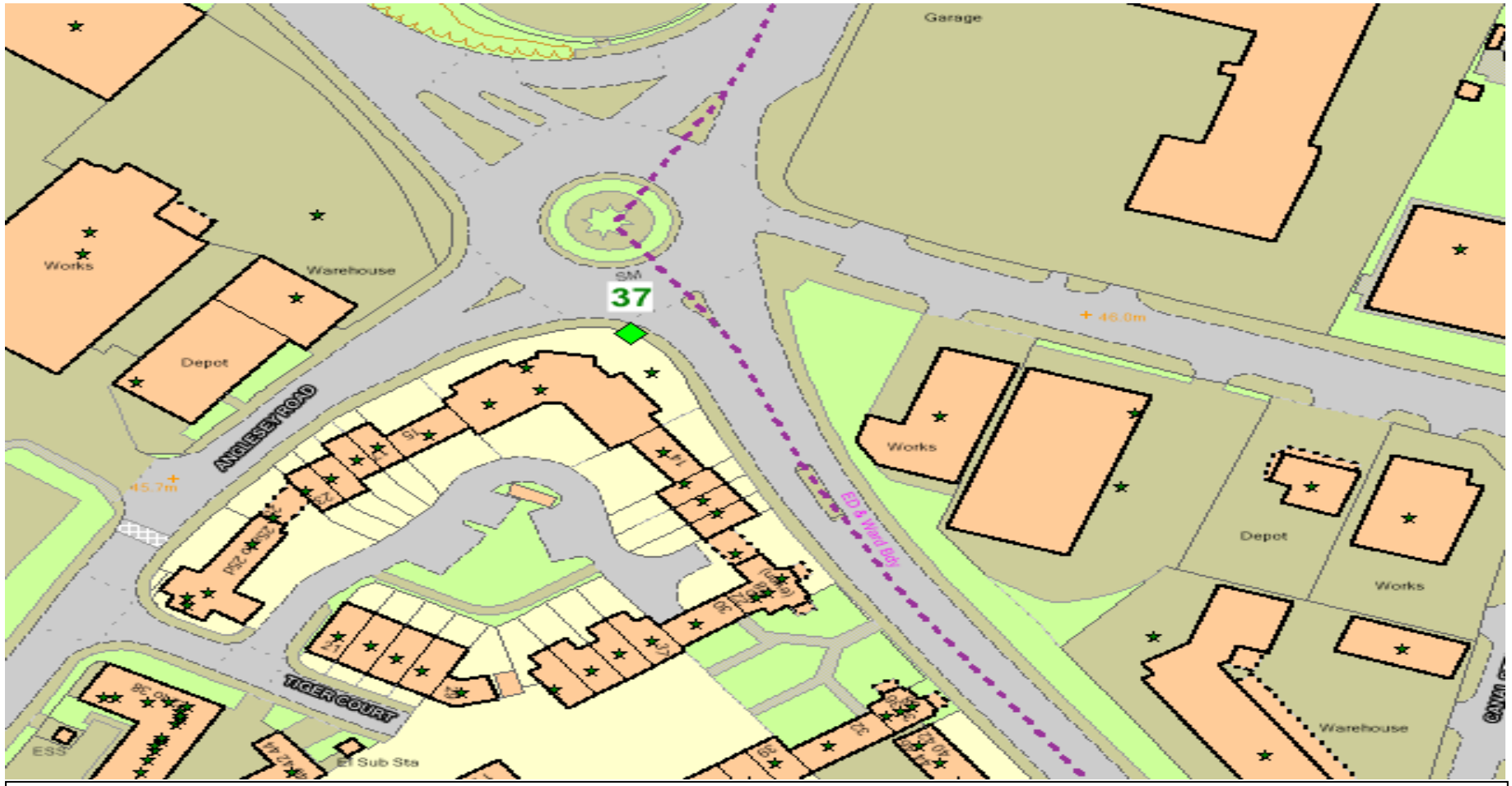

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Figure D10 - Diffusion tubes- Burton upon Trent – Orchard Street

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Figure D11 - Diffusion tubes- Burton upon Trent – Derby Road

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Figure D12 - Diffusion tubes- Burton upon Trent – Wellington Street/ Wellington Road

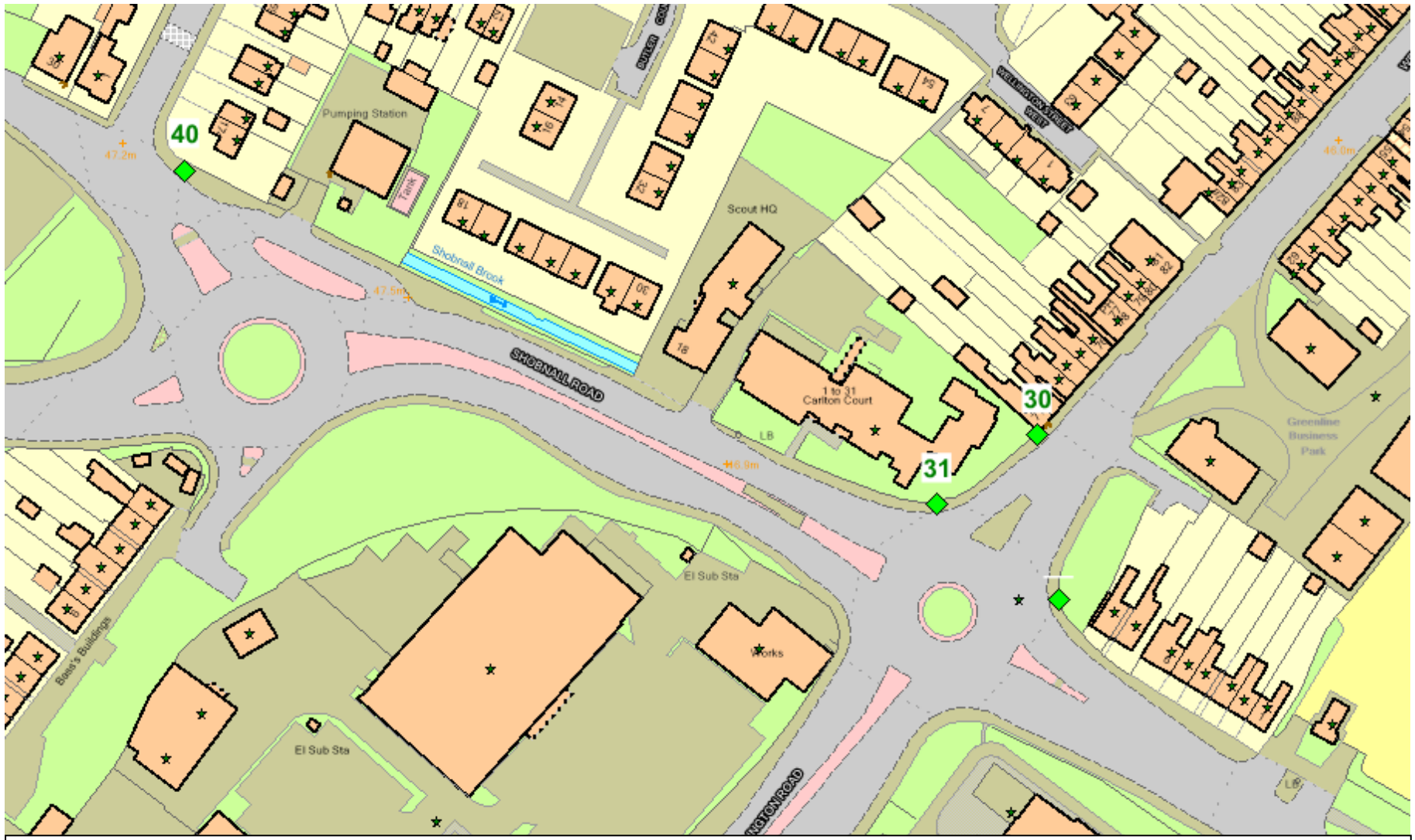

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Figure D13 - Diffusion tubes- Burton upon Trent – A38

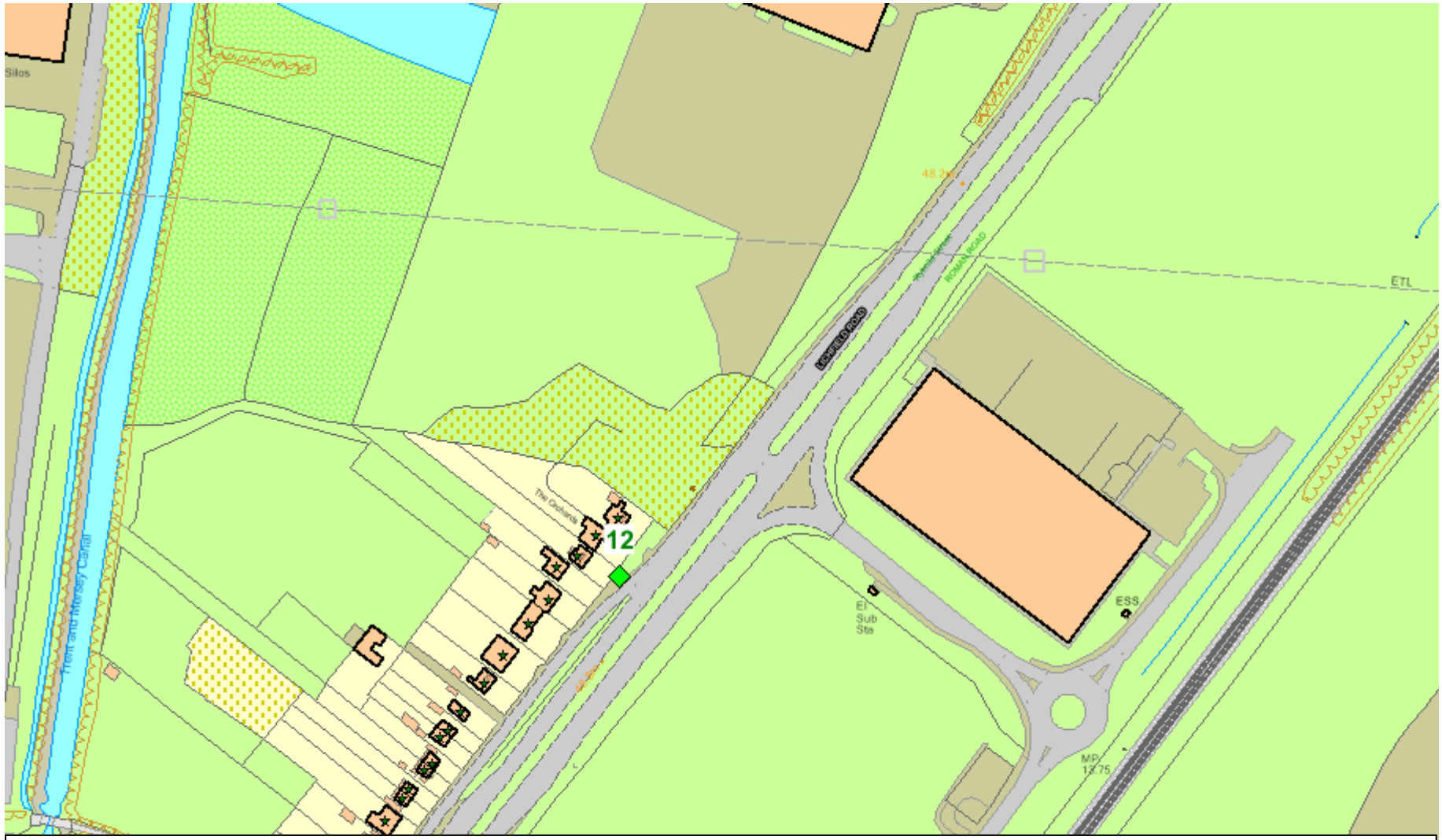

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Figure D14 - Diffusion tubes- Burton upon Trent – Bridge Street

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Figure D15 - Diffusion tubes- Burton upon Trent – St Peter's Street

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Figure D16 - Diffusion tubes- Burton upon Trent – A444

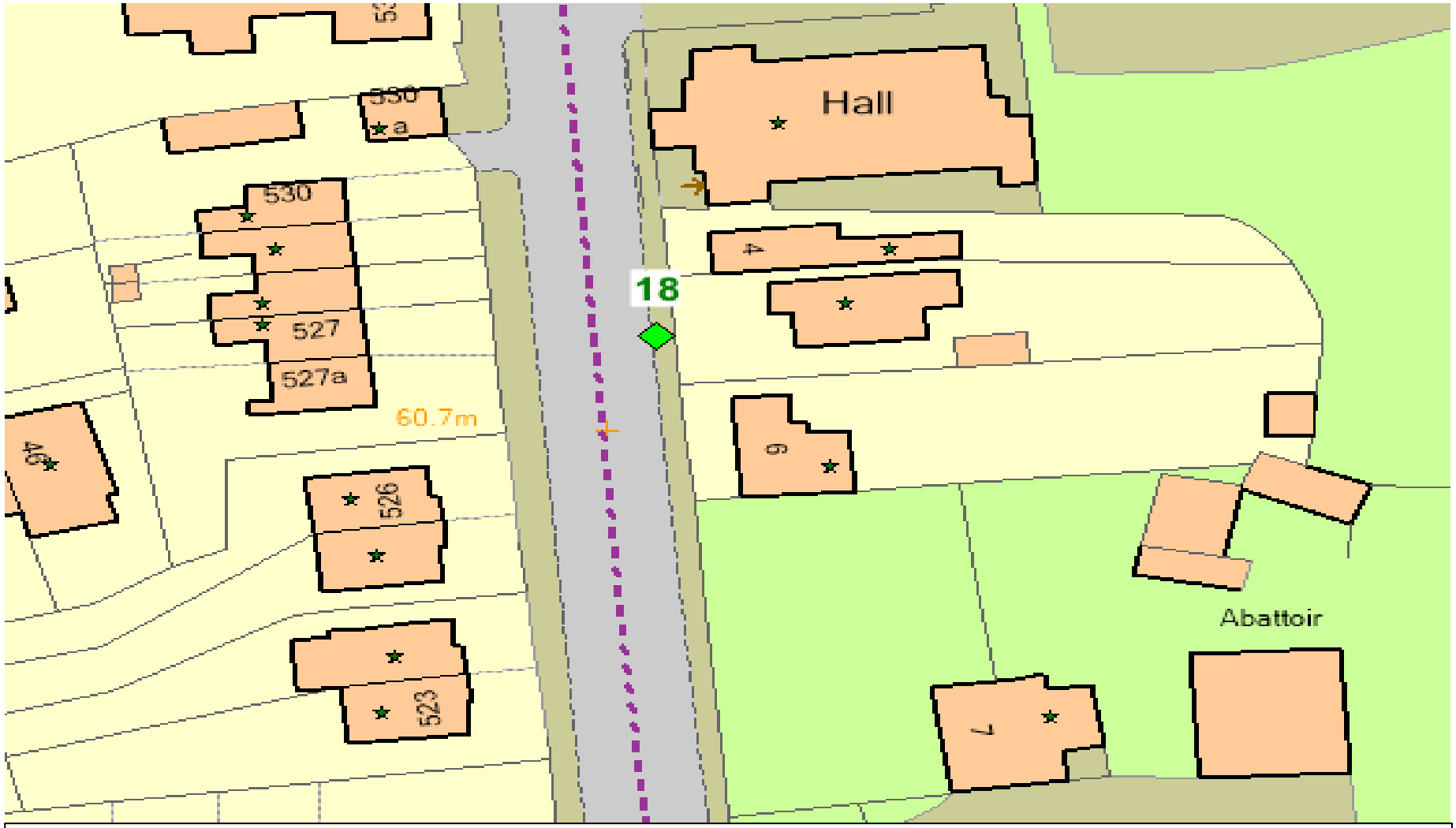

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Figure D17 - Diffusion tubes- Burton upon Trent – Shobnall Road

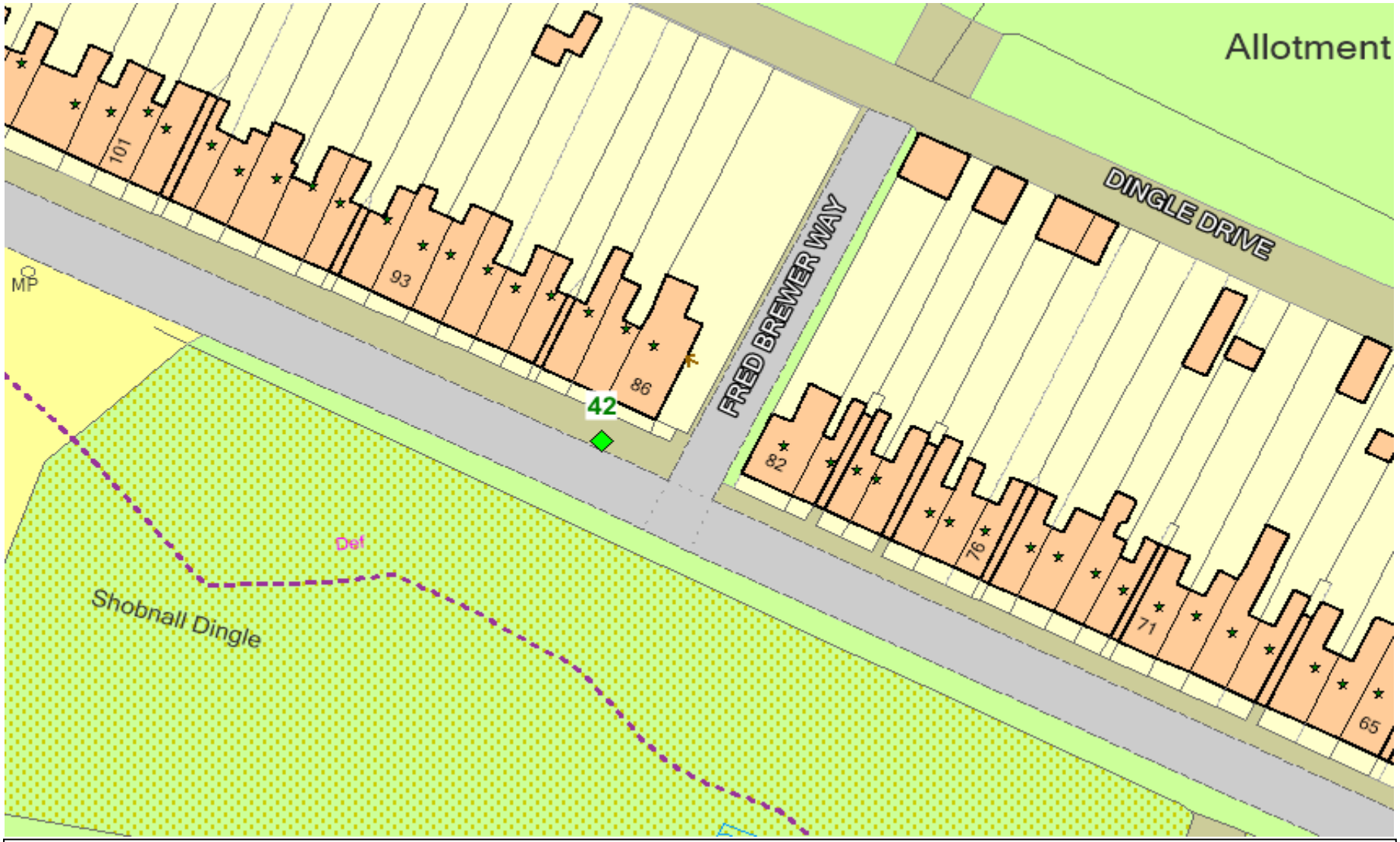

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Figure D18 - Diffusion tubes- Burton upon Trent – Shobnall Road

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Figure D19 - Diffusion tubes- Burton upon Trent – Brookside (urban background)

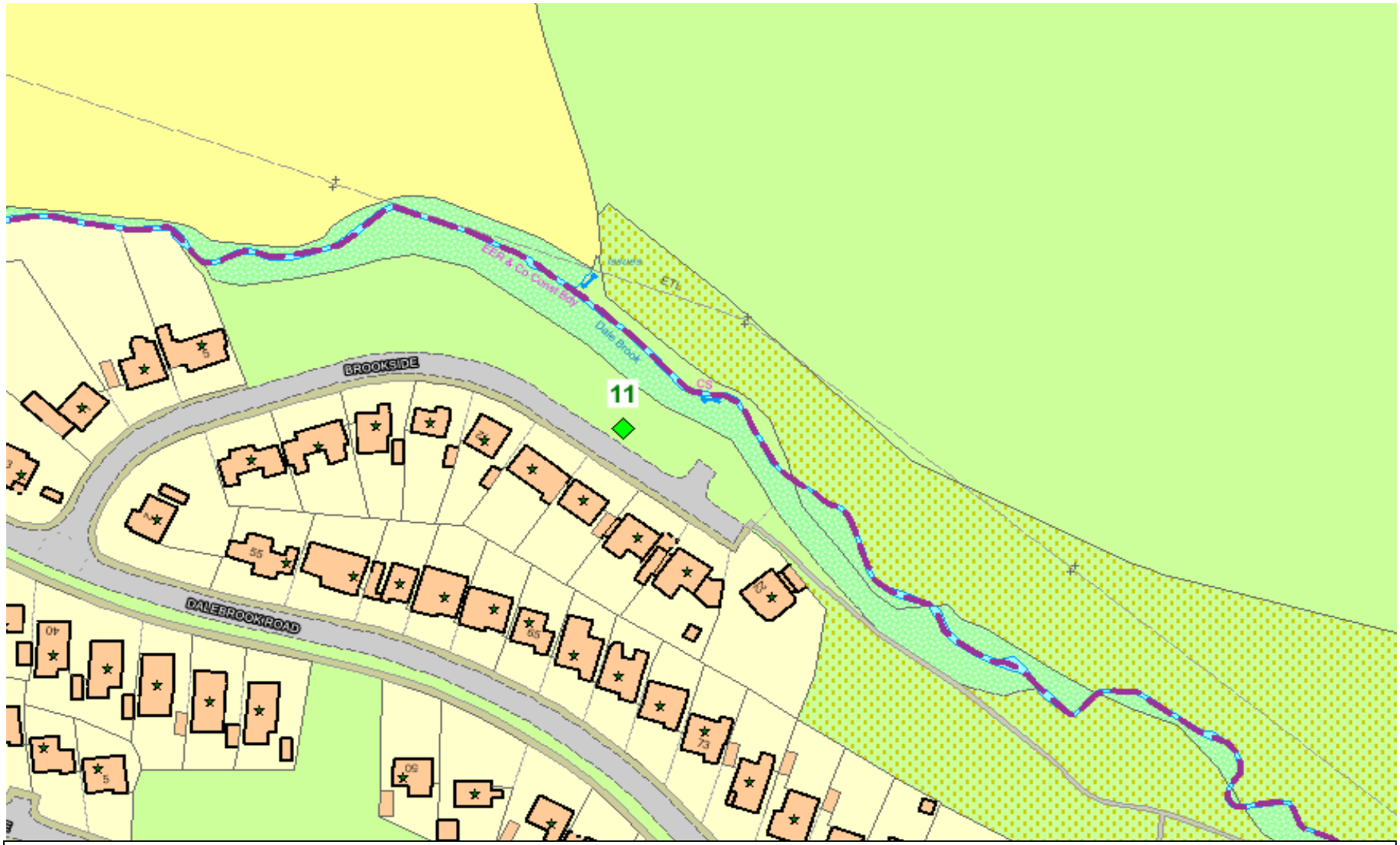

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Figure D20 - Diffusion tubes- Burton upon Trent – Horninglow Road

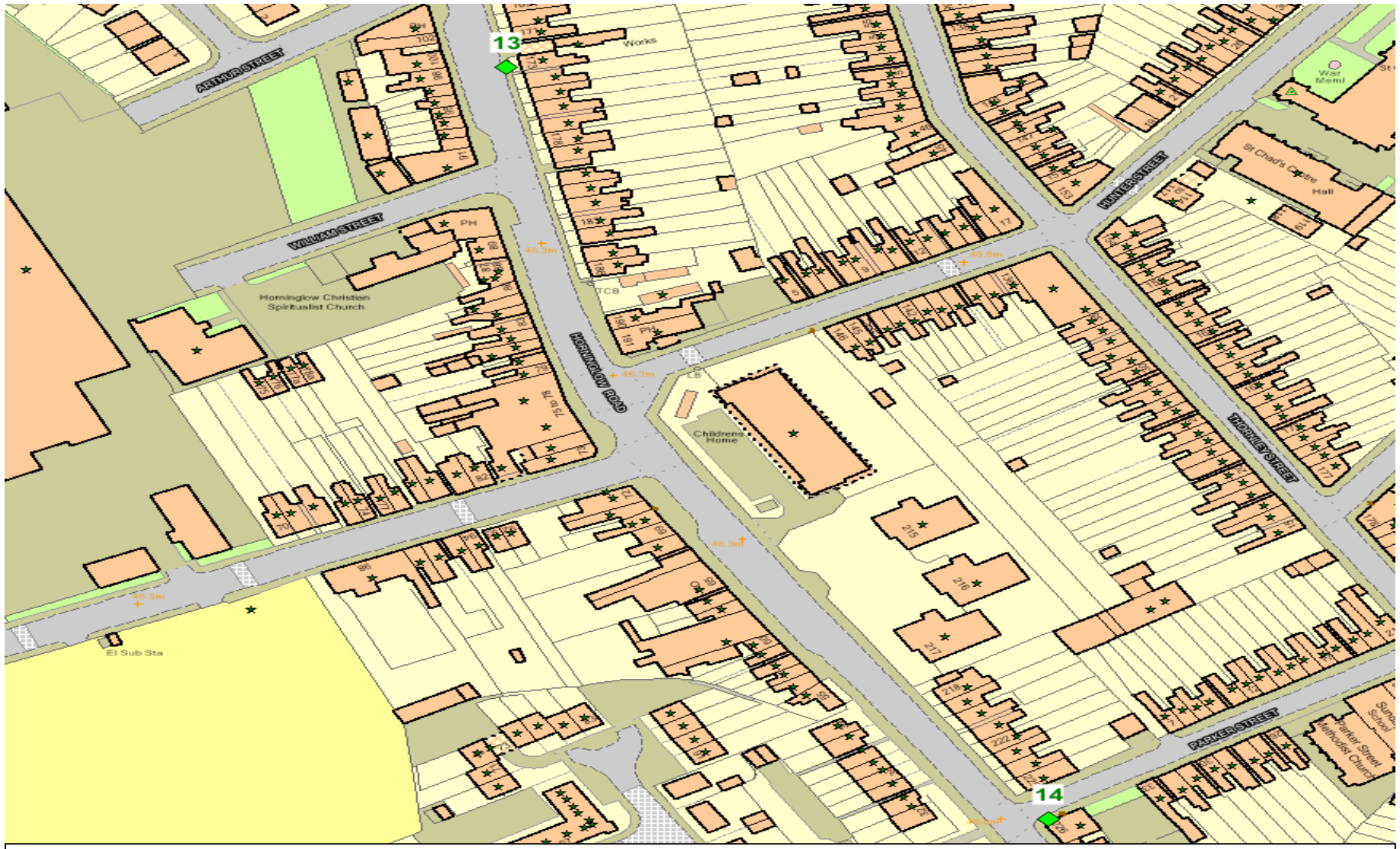

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Figure D21 - Diffusion tubes- Burton upon Trent – Horninglow Street

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Figure D22 - Diffusion tubes- Uttoxeter A50

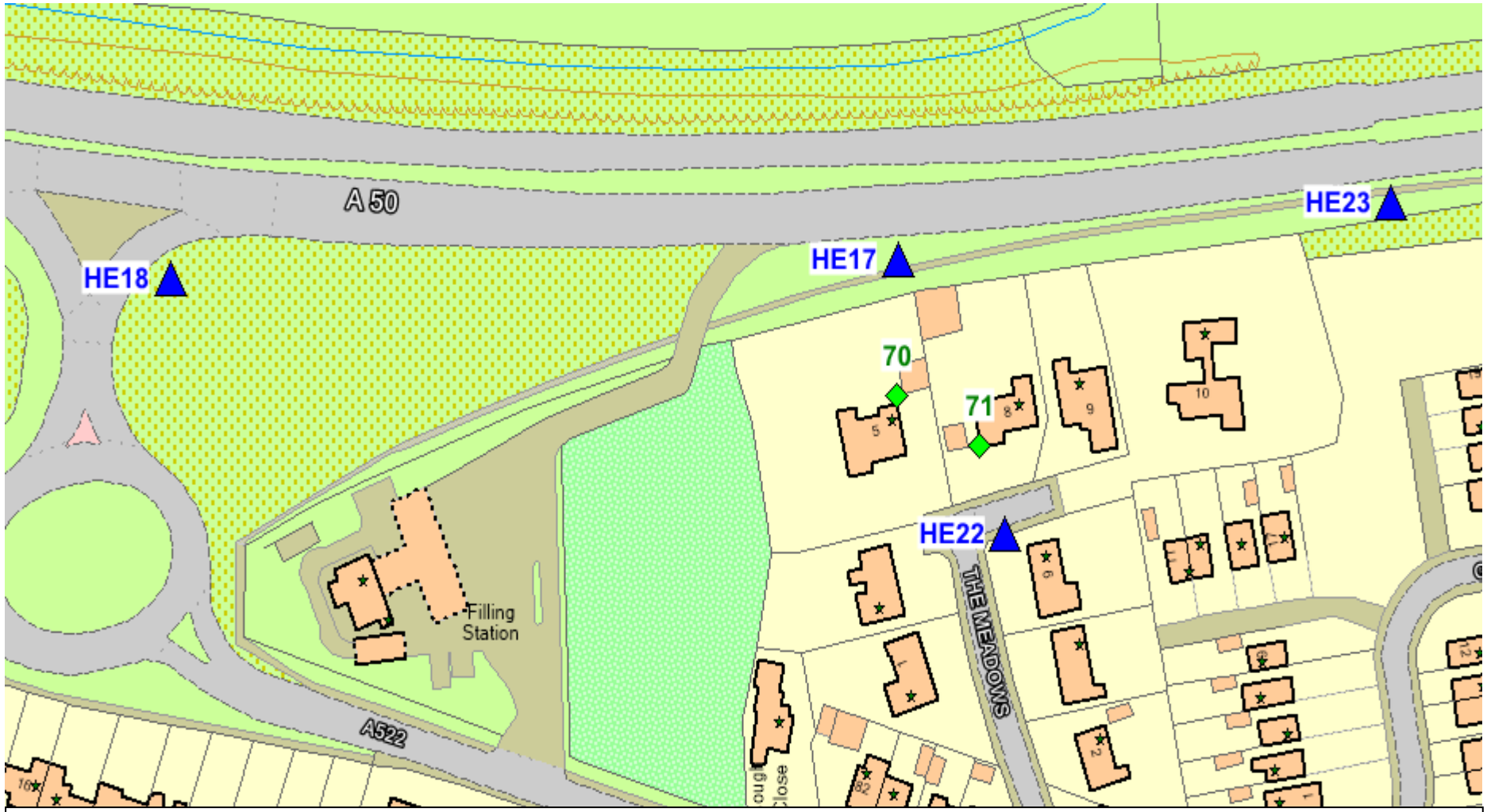

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Figure D23 - Diffusion tubes- Uttoxeter A50

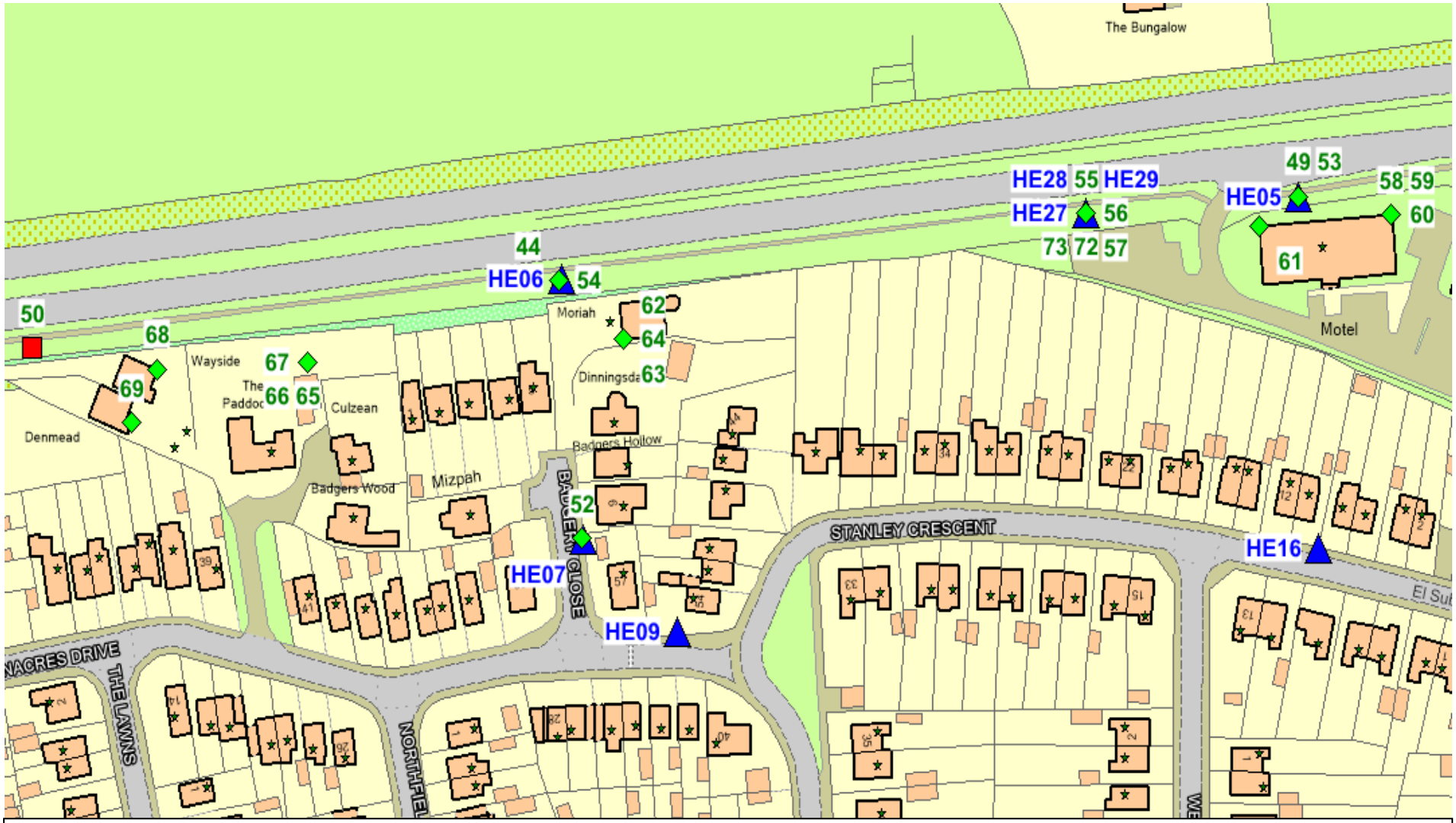

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Figure D24 - Diffusion tubes- Uttoxeter A50

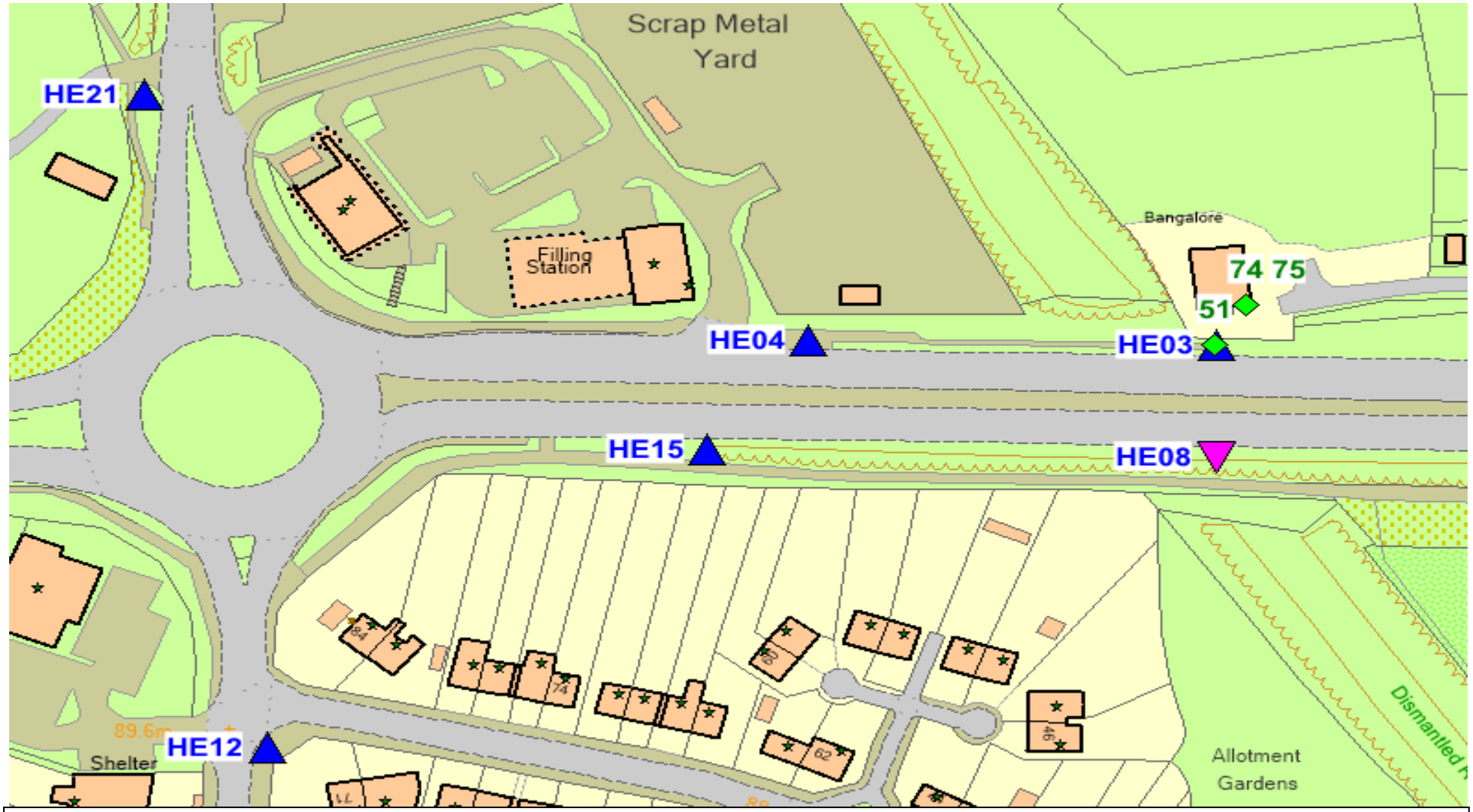

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Figure D25 - Diffusion tubes- Uttoxeter A50

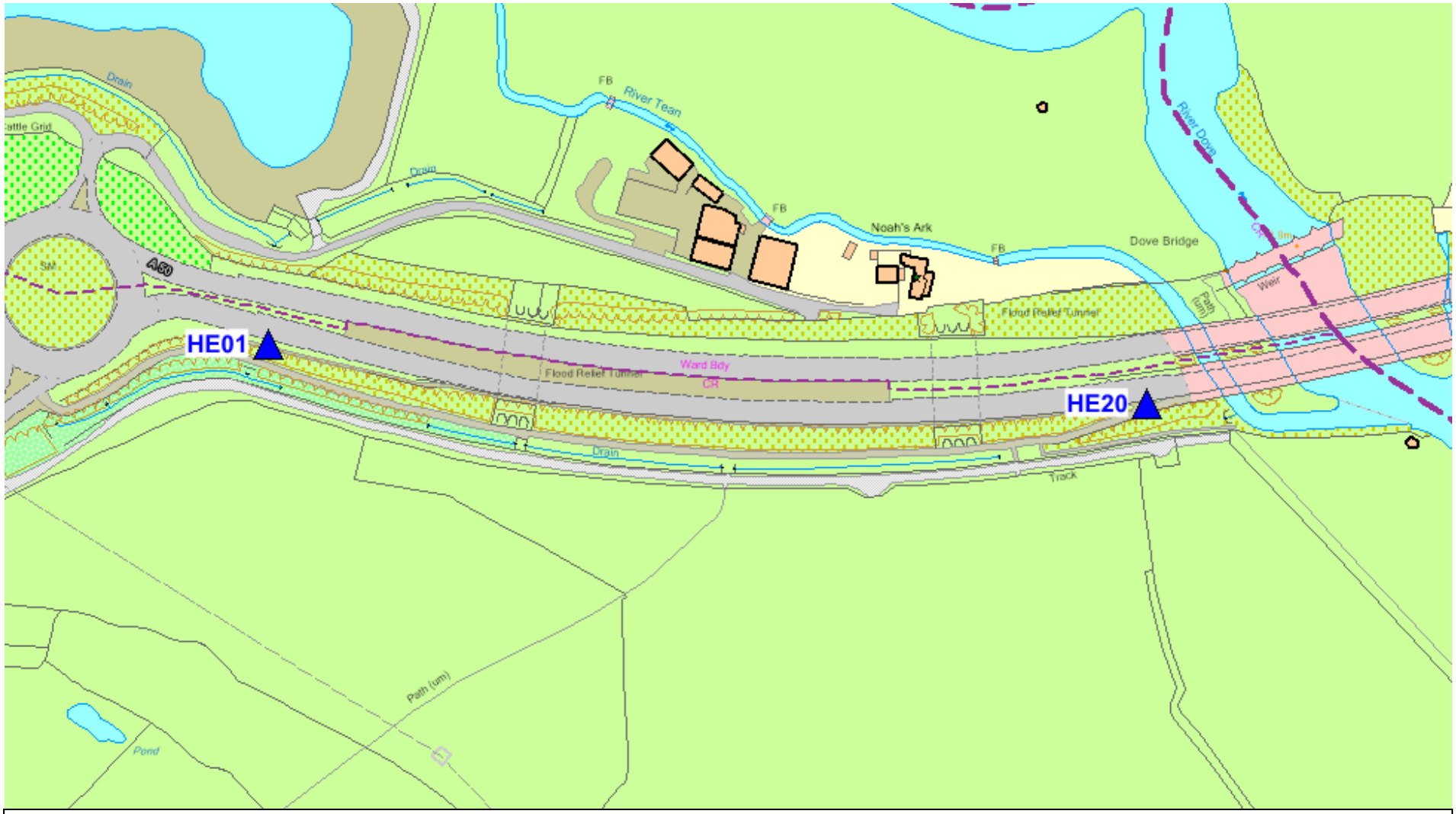

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Figure D26 - Diffusion tubes- Uttoxeter – Grenville Close (urban background)

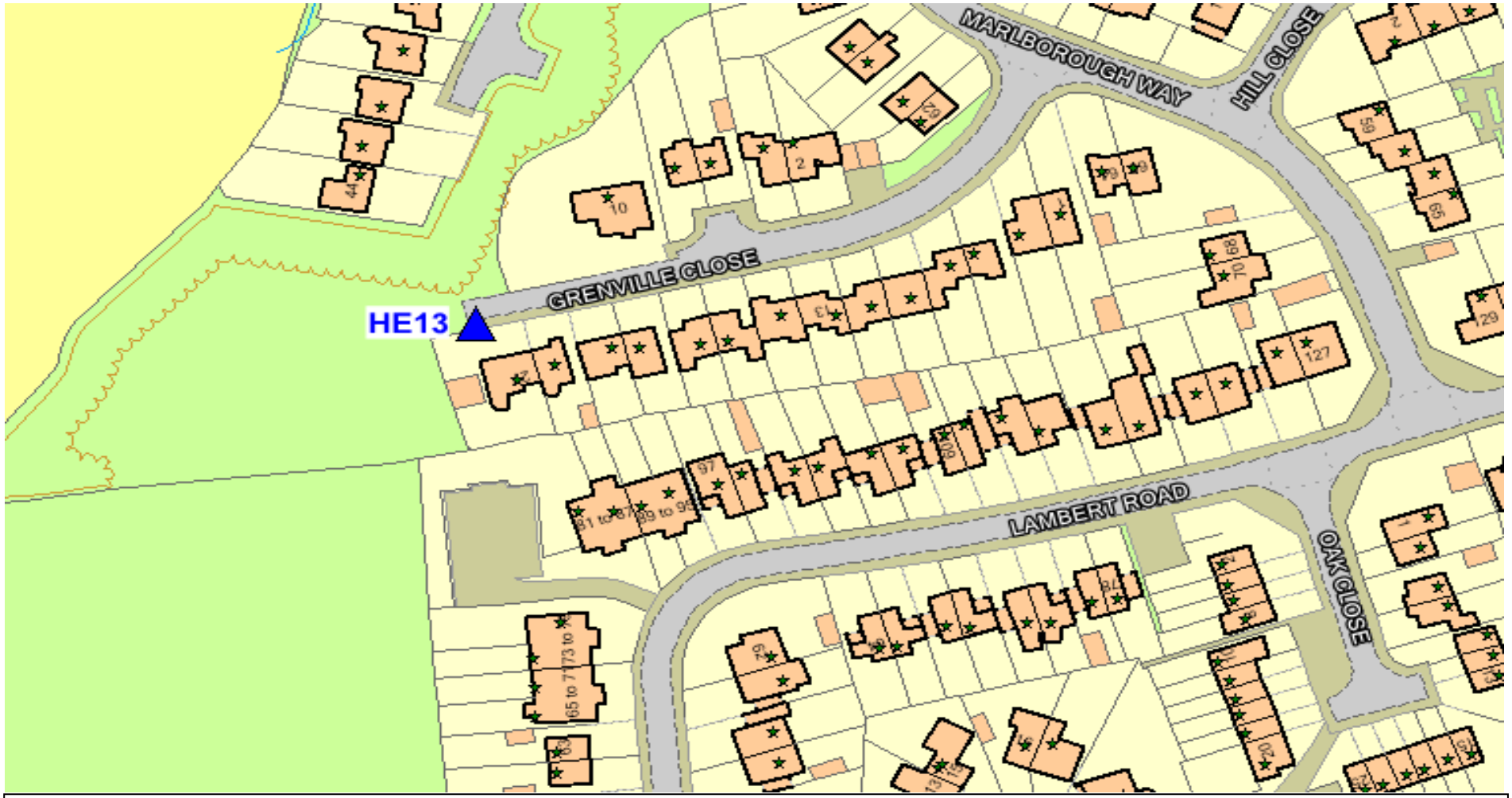

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Figure D27 - Diffusion tubes- Uttoxeter A50

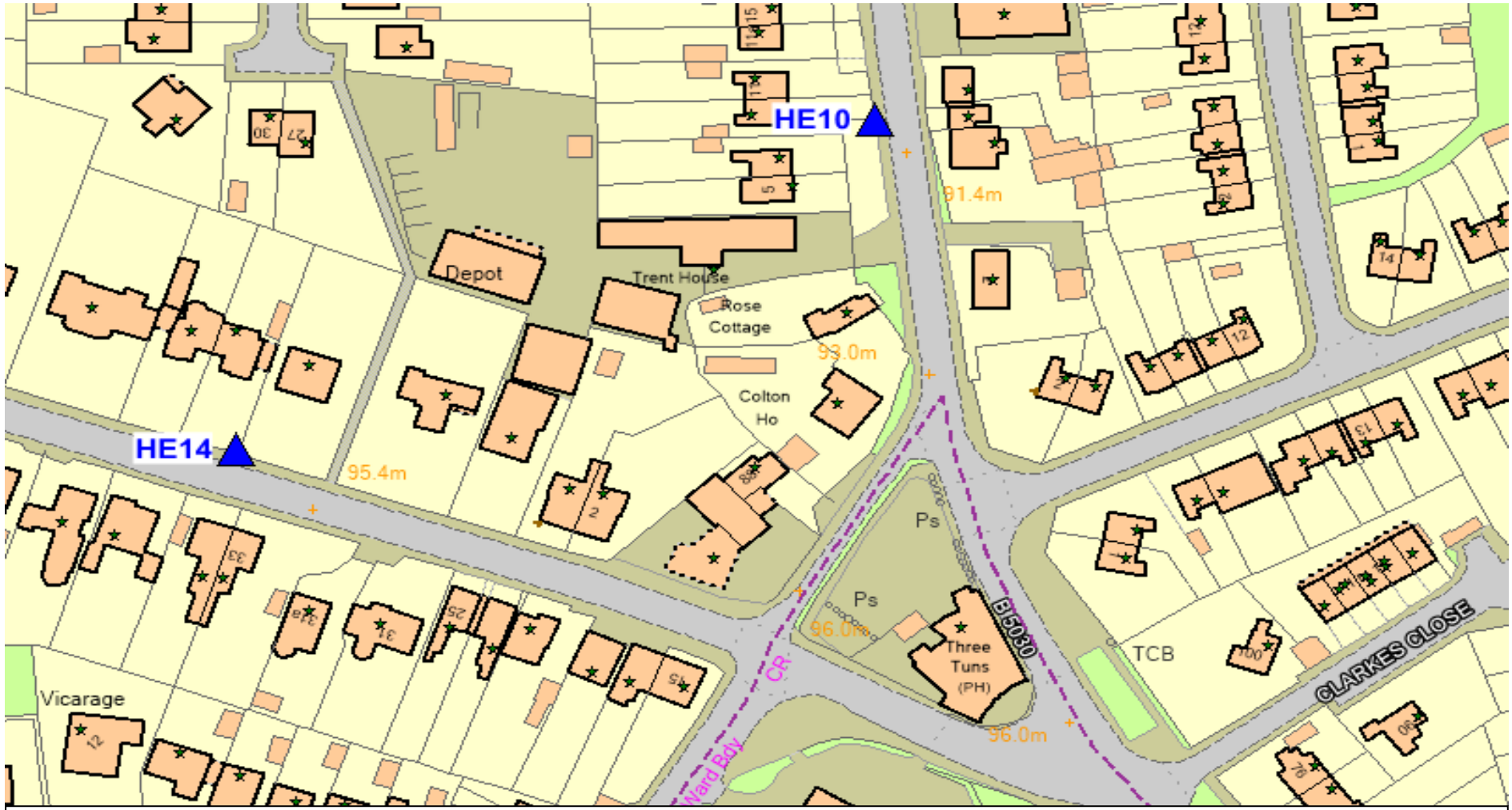

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Figure D28 - Diffusion tubes- Uttoxeter A50

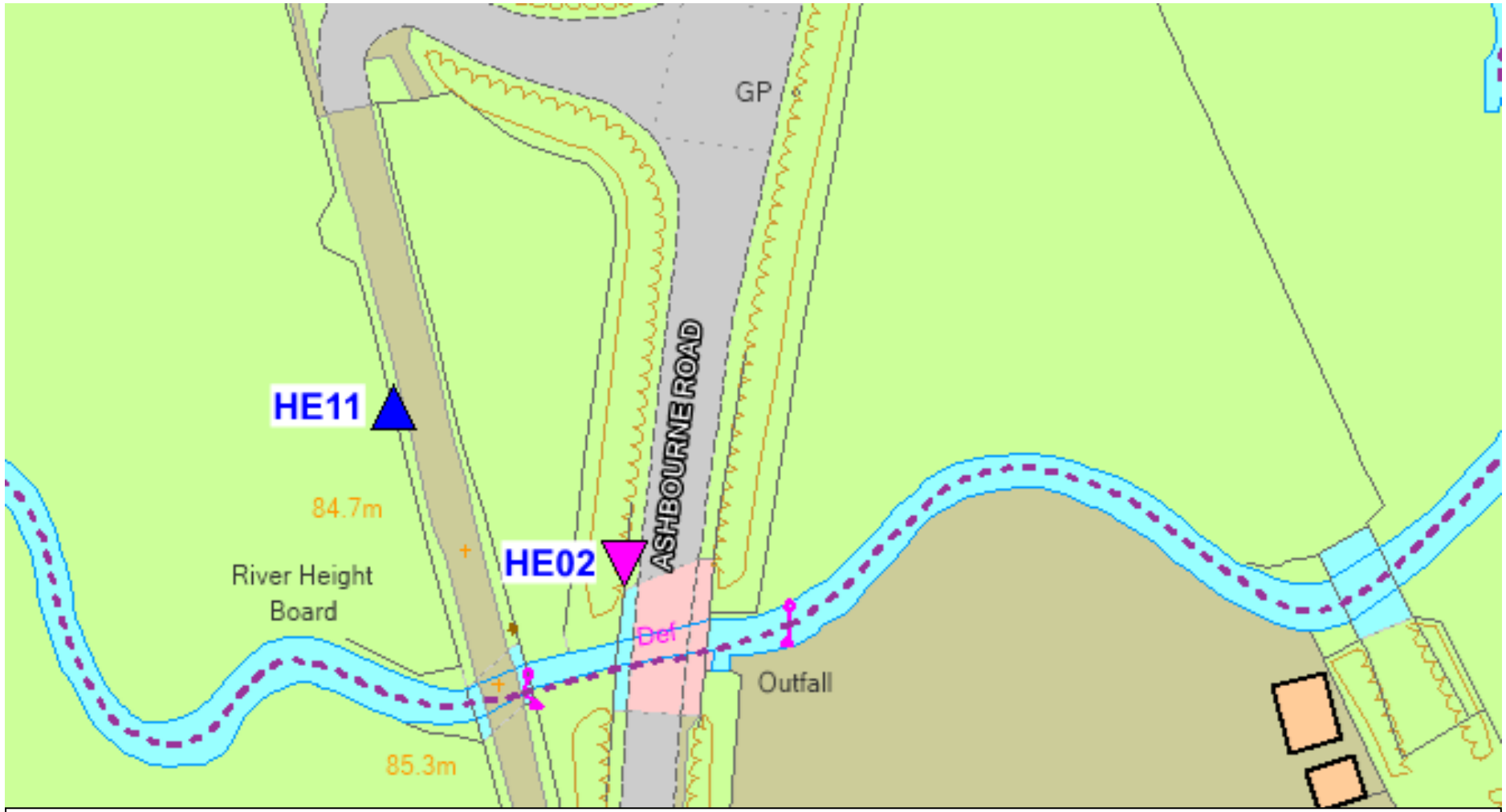

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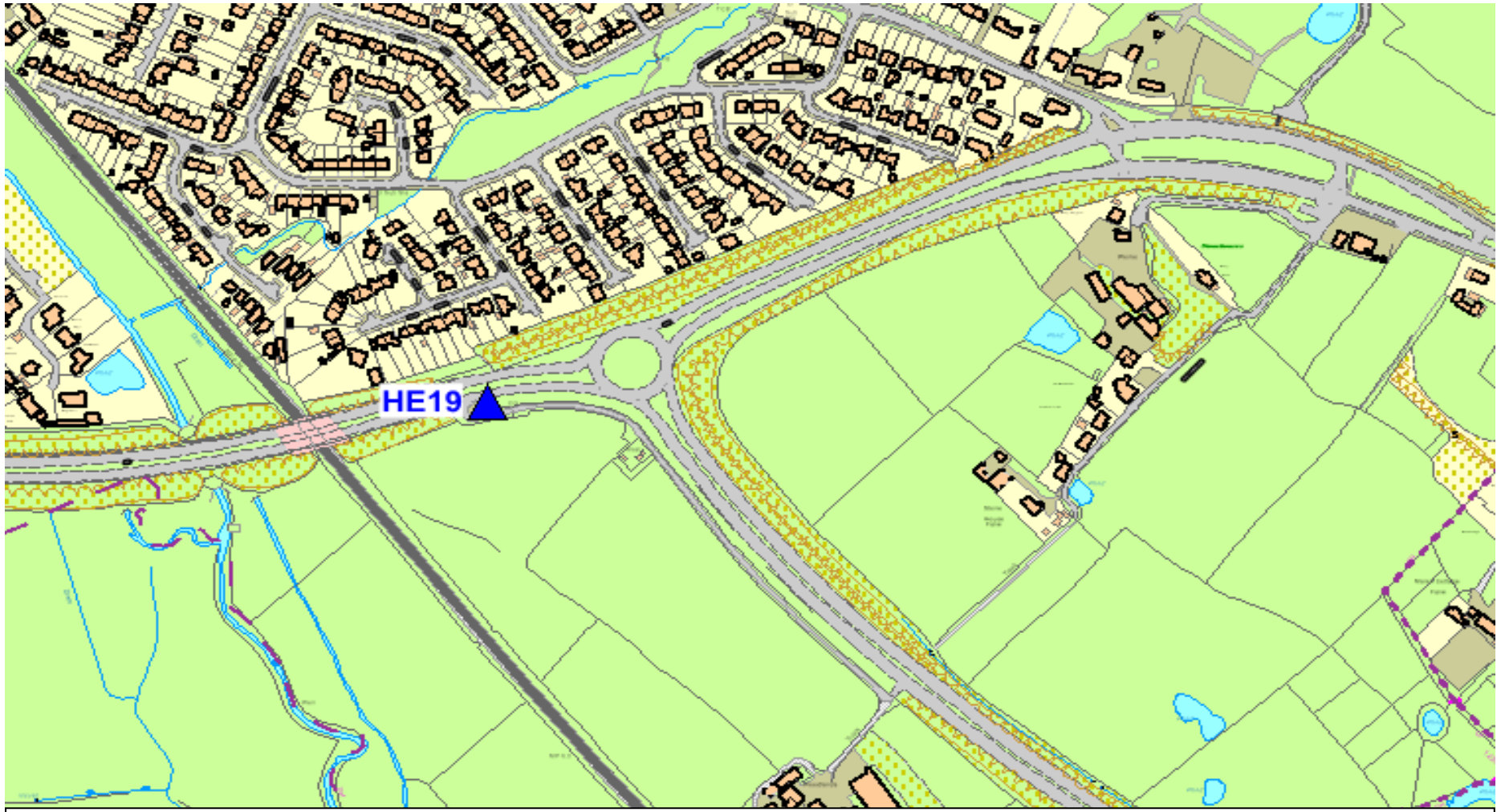
Figure D29 - Diffusion tubes- Uttoxeter A50



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Appendix E: Summary of Air Quality Objectives in England

Table E.1 – Air Quality Objectives in England

Pollutant	Air Quality Objective[4]	
	Concentration	Measured as
Nitrogen Dioxide (NO_2)	200 µg/m^3 not to be exceeded more than 18 times a year	1-hour mean
	40 µg/m^3	Annual mean
Particulate Matter (PM_{10})	50 µg/m^3, not to be exceeded more than 35 times a year	24-hour mean
	40 µg/m^3	Annual mean
Sulphur Dioxide (SO_2)	350 µg/m^3, not to be exceeded more than 24 times a year	1-hour mean
	125 µg/m^3, not to be exceeded more than 3 times a year	24-hour mean
	266 µg/m^3, not to be exceeded more than 35 times a year	15-minute mean

[4] The units are in micrograms of pollutant per cubic metre of air (µg/m^3).

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	Air quality Annual Status Report
Defra	Department for Environment, Food and Rural Affairs
DMRB	Design Manual for Roads and Bridges – Air quality screening tool produced by Highways England
EU	European Union
FDMS	Filter Dynamics Measurement System
LAQM	Local Air Quality Management
NO_2	Nitrogen Dioxide
NO_x	Nitrogen Oxides
PM_{10}	Airborne particulate matter with an aerodynamic diameter of 10µm (micrometres or microns) or less
$PM_{2.5}$	Airborne particulate matter with an aerodynamic diameter of 2.5µm or less
QA/QC	Quality Assurance and Quality Control
SO_2	Sulphur Dioxide
…	…