REPORT N^{O} 70018699

CALDERDALE LOCAL PLAN

AIR QUALITY CONSTRAINTS ASSESSMENT

AUGUST 2016

WSP | PARSONS BRINCKERHOFF

CALDERDALE LOCAL PLAN

AIR QUALITY CONSTRAINTS ASSESSMENT

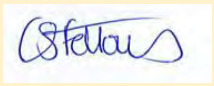
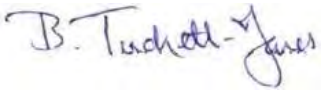
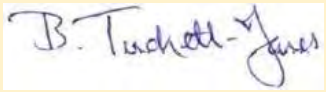
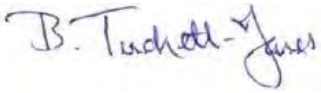
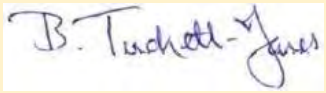
Calderdale Metropolitan Borough Council

Project no: 70018699
Date: July 2016

WSP | Parsons Brinckerhoff
Mountbatten House
Basing View
Basingstoke
RD21 4HJ

Tel: +44 (0) 1256 318 886
Fax: +44 (0) 1256 318 700
www.wsp-pb.com

QUALITY MANAGEMENT

ISSUE/REVISION	FIRST ISSUE	REVISION 1	REVISION 2	REVISION 3
Remarks	Final Rev(0)	Final Rev(1)		
Date	25 July 2016	25 August 2016		
Prepared by	Chloe Fellows	Chloe Fellows		
Signature				
Checked by	Bethan Tuckett-Jones	Bethan Tuckett-Jones		
Signature				
Authorised by	Bethan Tuckett-Jones	Bethan Tuckett-Jones		
Signature				
Project number	70016899	70016899		
Report number	70016899-01	70016899-01		

EXECUTIVE SUMMARY

WSP | Parsons Brinckerhoff has been commissioned by Calderdale Metropolitan Borough Council ('the Client') to undertake a desk based review of the current air quality baseline across Calderdale and to assess potential air quality constraints in order to inform the emerging Calderdale Local Plan.

This technical note sets out the key air quality elements to be considered when assessing the possible options for development within the emerging Local Plan. The Local Plan will need to identify land areas across the borough for future development. As such the plan will need to include a number of strategic and development policies relating to local air quality management, that will fulfil the National Planning Policy Framework (NPPF) sustainable development criteria.

A baseline review of existing air quality across the borough of Calderdale has been undertaken to ascertain any air quality constraints for assessing areas for development within the emerging Calderdale Local Plan. This technical note is designed to act as a starting point for decision making as to the location of future land allocations for development within the borough, and will be used to inform the decision making process that will create the draft Local Plan.

In terms of local air quality, CMBC has designated seven Air Quality Management Areas (AQMAs) within their administrative area as a consequence of their Review and Assessment work. These have often been declared in areas where there is a combination of high traffic volumes and buildings located close to the roadside which can hinder the dispersion of exhaust fumes. Local air quality monitoring data shows exceedences of the annual mean NO_2 concentration objective are only occurring within these AQMAs.

Junction capacity constraints have also been identified and are located in key population areas of Calderdale. It is clear from this review that there is a correlation between the junction capacity constraints on the network and areas of poor air quality.

Local planning policy therefore plays a significant role in ensuring that development schemes are designed with a sustainable approach. Pre-application discussions with the relevant air quality officer are also important to confirm the scale of development and the assessment requirements. In addition, there will be a need to assess air quality to sustain compliance with and contribute towards EU limit values or national objectives for pollutants.

It is apparent that the eastern side of Calderdale has preferential status for development. As larger towns are already located in the east, this area can be considered a more sustainable location for future development. This is because there is a greater opportunity for improved sustainable transport and highway constraints appear to be more readily improved in the east of Calderdale. Such measures work positively with air quality thus limiting constraints in this region.

Development proposals with the likelihood to cause pollution or be exposed to potential sources of pollution will therefore need to demonstrate that measures can be implemented to minimise emissions to a satisfactory level, and in particular within AQMAs proposals should be consistent with the aims and objectives of the Council's Air Quality Action Plan and NPFF.

TABLE OF CONTENTS

EXECUTIVE SUMMARY I

1 INTRODUCTION.....1

2 POLICY, LEGISLATION & GUIDANCE 2

3 SCOPE AND METHODOLOGY 8

4 BASELINE AIR QUALITY 10

5 AIR QUALITY CONSTRAINTS 17

6 FUTURE OPPORTUNITIES 20

7 SUMMARY.....21

1 INTRODUCTION

1.1 PURPOSE

WSP | Parsons Brinckerhoff has been commissioned by Calderdale Metropolitan Borough Council ('the Client') to undertake a desk based review of the current air quality baseline across Calderdale and to assess potential air quality constraints in order to inform the emerging Calderdale Local Plan.

This technical note is designed to act as a starting point for decision making as to the location of future land allocations for development within the borough, and will be used to inform the decision making process that will create the draft Local Plan.

A glossary of terms used within this technical note is provided in Appendix A.

1.2 PROJECT BACKGROUND

The Localism Act 2011, which amended The Planning and Compulsory Act 2004, requires that planning authorities prepare Local Plans which will identify land areas for future development. These are to include a number of strategic and development policies relating to local air quality management that will fulfil the National Planning Policy Framework (NPFF) sustainable development criteria.

The Calderdale Local Plan will be the new development plan for Calderdale, and will supersede the Replacement Calderdale Unitary Development Plan 2006 (RCUDP); however this is not likely to occur until at least 2017. Planning decisions in the interim are based upon the RCUDP and NPPF. The Council is currently progressing the Calderdale Local Plan as a single document which combines the functions of a Core Strategy and Land Allocations and Designations Plan. Consultation on Potential Sites and Other Aspects of the Local Plan was carried out during November and December 2015.

2 POLICY, LEGISLATION & GUIDANCE

2.1 PLANNING POLICY

A summary of the relevant air quality policy is provided below.

NATIONAL PLANNING POLICY

NATIONAL PLANNING POLICY FRAMEWORK

The Government's overall planning policies for England are described in the National Planning Policy Framework[1]. This document also outlines the means by which Government intends to apply these policies at various levels to achieve its aim of contributing to sustainable development. The Framework acknowledges the importance of appropriate and robust planning at a local level and thus promotes opportunities for communities to engage in plan making at a neighbourhood level. The core underpinning principle of the framework is the presumption in favour of sustainable development, defined as:

'Development that meets the needs of the present without compromising the ability of future generations to meet their own needs'

One of the 12 core planning principles in the NPPF is that planning should '*contribute to conserving and enhancing the natural environment and reducing pollution*.'

In relation to air quality, the following paragraphs are relevant:

- Paragraph 109, which states 'The planning system should contribute to and enhance the natural and local environment by:…preventing both new and existing development from contributing to or being put at unacceptable risk from, or being adversely affected by unacceptable levels of soil, air, water, or noise pollution...';
- Paragraph 110, which states 'In preparing plans to meet development needs, the aim should be to minimise pollution and other adverse effects on the local and natural environment. Plans should allocate land with the least environmental or amenity value, where consistent with other policies in this Framework...';
- Paragraph 122, which states '…local planning authorities should focus on whether the development itself is an acceptable use of the land, and the impact of the use, rather than the control of processes or emissions themselves where these are subject to approval under pollution control regimes. Local planning authorities should assume that these regimes will operate effectively. Equally, where a planning decision has been made on a particular development, the planning issues should not be revisited through the permitting regimes operated by pollution control authorities';
- Paragraph 124, which states 'planning policies should sustain compliance with and contribute towards EU limit values or national objectives for pollutants, taking into account the presence of Air Quality Management Areas and the cumulative impacts on air quality from individual sites in local areas. Planning decisions should ensure that any new development in Air Quality Management Areas is consistent with the local air quality action plan'; and

[1] Department for Communities and Local Government (2012). National Planning Policy Framework.

- Paragraph 203, which states ‘local planning authorities should consider where otherwise unacceptable development could be made acceptable though the use of conditions or planning obligations. Planning obligations should only be used where it is not possible to address unacceptable impacts through a planning condition.’

LOCAL PLANNING POLICY

Planning decisions relating to the use of land and buildings within Calderdale are currently based upon the RCUDP. This document has statutory weight and is used in determining planning applications and guiding investment decisions by both the public and private sectors for development. The RCUDP is a land-use strategy for the District, and provides a framework for rational and consistent decision making. The main purposes of the RCUDP as listed within the plan are:

- to control the location and quality of development;
- to provide for new development particularly for employment, housing, open space, retailing and community facilities, where necessary and appropriate;
- to protect and enhance the environment of Calderdale, to conserve its natural beauty and maintain the amenity of land;
- to safeguard and improve the most important built and natural assets within the District;
- to provide infrastructure and facilities for services to meet the needs of communities;
- to plan the use of land in the interests of managing traffic, protecting communities from the effects of congestion and reducing the overall need to travel;
- to reflect the land use needs and aspirations of all those with an interest in the use of Calderdale’s land and buildings, wherever possible and appropriate; and
- to ensure that development is undertaken in the most sustainable way possible, recognising the needs of the community for new development and infrastructure but ensuring that it is not provided at the expense of future generations.

In relation to air quality, the following policies are relevant:

POLICY GP1

This policy aims to encourage sustainable development through the effective protection and enhancement of the environment. Linked with this are sustainable development objectives which seek to limit and reduce pollution by:

- Minimising travel needs and maximising use of energy efficient modes of transport;
- Controlling all forms of pollution;
- Encouraging the use of renewable energy sources;
- Protection of trees and encouragement of tree planting;
- Improving the energy efficiency in new housing;
- Promote waste reduction and a more sustainable waste management strategy; and
- Traffic reduction measures.

POLICY EP1: PROTECTION OF AIR QUALITY

This policy states that development which might cause air pollution (including that from modes of transport) will only be permitted if:

- it would not harm the health and safety of users of the site and surrounding area; and
- it would not harm the quality and enjoyment of the environment.

Where permission is granted, appropriate conditions and/or planning obligations will be attached to ensure that the air quality is maintained.

2.2 AIR QUALITY LEGISLATION

A summary of the relevant air quality legislation is provided below.

UK AIR QUALITY STRATEGY

The Government's policy on air quality within the UK is set out in the Air Quality Strategy for England, Scotland, Wales and Northern Ireland (AQS)[2]. The AQS provides a framework for reducing air pollution in the UK with the aim of meeting the requirements of European Union legislation.

The AQS also sets standards and objectives for nine key air pollutants to protect health, vegetation and ecosystems. These are benzene (C_6H_6), 1,3 butadiene (C_4H_6), carbon monoxide (CO), lead (Pb), nitrogen dioxide (NO_2), particulate matter (PM_{10} and $PM_{2.5}$), sulphur dioxide (SO_2), ozone (O_3), and polycyclic aromatic hydrocarbons (PAHs). The standards and objectives for the pollutants considered in this assessment are given in **Appendix B**.

The air quality standards are levels recommended by the Expert Panel on Air Quality Standards (EPAQS) and the World Health Organisation (WHO) with regards to current scientific knowledge about the effects of each pollutant on health and the environment.

The air quality objectives are medium-term policy based targets set by the Government, which take into account economic efficiency, practicability, technical feasibility and timescale. Some objectives are equal to the EPAQS recommended standards or WHO guideline limits, whereas others involve a margin of tolerance, i.e. a limited number of permitted exceedances of the standard over a given period.

For the pollutants considered in this assessment, there are both long-term (annual mean) and short-term standards. In the case of NO_2, the short-term standard is for a 1-hour averaging period, whereas for PM_{10} it is for a 24-hour averaging period. These periods reflect the varying impacts on health of differing exposures to pollutants, for example temporary exposure on the pavement adjacent to a busy road, compared with the exposure of residential properties adjacent to a road.

The AQS contains a framework for considering the effects of a finer group of particles known as '$PM_{2.5}$' as there is increasing evidence that this size of particles can be more closely associated with observed adverse health effects than PM_{10}. Local Authorities are required to work towards reducing emissions/concentrations of particulate matter within their administrative area. However, there is no statutory objective given in the AQS for $PM_{2.5}$ at this time.

[2] Department for Environment, Food and Rural Affairs (DEFRA) and the Devolved Administrations (2007). The Air Quality Strategy for England, Scotland, Wales and Northern Ireland (Volumes 1 and 2)

AIR QUALITY REGULATIONS

Many of the objectives in the AQS have been made statutory in England with the Air Quality (England) Regulations 2000[3] and the Air Quality (England) (Amendment) Regulations 2002[4] for the purpose of Local Air Quality Management (LAQM).

These Regulations require that likely exceedances of the AQS objectives are assessed in relation to:

"…the quality of air at locations which are situated outside of buildings or other natural or man-made structures, above or below ground, and where members of the public are regularly present…"

The Air Quality Standards Regulations 2010[5] transpose the European Union Ambient Air Quality Directive (2008/50/EC)[6] into law in England. This Directive sets legally binding limit values for concentrations in outdoor air of major air pollutants that impact public health such as PM_{10}, $PM_{2.5}$ and NO_2. The limit values for NO_2 and PM_{10} are the same concentration levels as the relevant. AQS objectives, and the limit value for $PM_{2.5}$ introduced in this Directive is a concentration of 25µg/m^3 to apply from 2015.

ENVIRONMENT ACT 1995

Under Part IV of the Environment Act 1995, local authorities must review and document local air quality within their area by way of staged appraisals and respond accordingly, with the aim of meeting the air quality objectives defined in the Regulations. Where the objectives are not likely to be achieved, an authority is required to designate an Air Quality Management Area (AQMA). For each AQMA the local authority is required to draw up an Air Quality Action Plan (AQAP) to secure improvements in air quality and show how it intends to work towards achieving air quality standards in the future.

2.3 GUIDANCE

A summary of the guidance documents referred to in the undertaking of this air quality constraints review is provided below.

IMPROVING AIR QUALITY IN THE UK: TACKLING NITROGEN DIOXIDE IN OUR TOWNS AND CITIES: UK OVERVIEW DOCUMENT

The Department for Environment, Food and Rural Affairs (DEFRA) has recently published new guidance on their air quality plan for the achievement of EU air quality limit values for NO_2 in the UK[7]. This plan, along with zone specific plans, together forms the Government's plan for reducing NO_2 emissions in our towns and cities as part of its commitment for cleaner air.

[3] The Air Quality (England) Regulations 2000 - Statutory Instrument 2000 No.928
[4] The Air Quality (England) (Amendment) Regulations 2002- Statutory Instrument 2002 No.3043
[5] The Air Quality Standards Regulations 2010 - Statutory Instrument 2010 No. 1001
[6] Directive 2008/50/EC of the European Parliament and of the Council of 21 May 2008 on ambient air quality and cleaner air for Europe
[7] Department for Environment, Food and Rural Affairs (DEFRA) (2015). Improving air quality in the UK. Tackling nitrogen dioxide in our towns and cities. UK overview document.

AIR QUALITY PLAN FOR THE ACHIEVEMENT OF EU AIR QUALITY LIMIT VALUE FOR NITROGEN DIOXIDE (NO_2) IN YORKSHIRE AND HUMBERSIDE

DEFRA has recently published a series of zone specific plans setting out what the government will be doing in regional areas to improve air quality and reduce NO_2 emissions[8]. Of relevance to this study is the Yorkshire and Humberside Plan which sets out what the Government will be doing in Yorkshire and Humberside.

LOCAL AIR QUALITY MANAGEMENT REVIEW AND ASSESSMENT TECHNICAL GUIDANCE

DEFRA has recently published updated technical guidance for use by local authorities in their review and assessment work[9]. This guidance, referred to in this document as LAQM (TG16), has been considered within this review where appropriate.

LAND-USE PLANNING & DEVELOPMENT CONTROL: PLANNING FOR AIR QUALITY

In May 2015 Environmental Protection UK (EPUK) and the Institute of Air Quality Management (IAQM) published updated guidance[10] offering comprehensive advice on: when an air quality assessment may be required; what should be included in an assessment; how to determine the significance of any air quality impacts associated with a development; and, the possible mitigation measures which may be implemented to minimise these impacts. It is noted that this guidance is not intended for the assessment of air quality impacts on ecological receptors.

NATIONAL PLANNING PRACTICE GUIDANCE

This guidance[11] provides a number of guiding principles on how the planning process can take into account the impact of new development on air quality, and explains how much detail air quality assessments need to include for proposed developments, and how impacts on air quality can be mitigated. It also provides information on how air quality is taken into account by Local Authorities in both the wider planning context of Local Plans and neighbourhood planning, and in individual cases where air quality is a consideration in a planning decision.

AIR QUALITY AND EMISSIONS TECHNICAL PLANNING GUIDANCE PART OF THE WEST YORKSHIRE LOW EMISSIONS STRATEGY

The five West Yorkshire Authorities are currently working towards adoption of the West Yorkshire Low Emission Strategy (WYLES). This document sets out the methodology which should be applied to planning applications with regard to air quality and emissions. It forms part of an *'overarching Low Emissions Strategy which aims to reduce road transport emissions in West Yorkshire'.*

---

[8] Department for Environment, Food and Rural Affairs (DEFRA) (2015). Air Quality Plan for the achievement of EU air quality limit value for nitrogen dioxide (NO_2) in Yorkshire and Humberside (UK0034)

[9] DEFRA (2016) Part IV The Environment Act 1995 and Environment (Northern Ireland) Order 2002 Part III, Local Air Quality Management Technical Guidance (TG16)

[10] Environmental Protection UK and Institute of Air Quality Management (2015). Land Use Planning & Development Control: Planning for Air Quality

[11] Department of Communities and Local Government (DCLG) (March 2014). National Planning Practice Guidance

This guidance is aimed at helping planning authorities to deliver national air quality objectives through cost effective service planning. This is to be achieved through joint working and individual policy set out in each of the five authority's respective Local Plan policies. This guidance also provides a template for combining air quality considerations into land-use planning and development management policies, which can then be used to influence the reduction of road transport emissions and to be used to update air quality action plans.

2.4 SUMMARY OF IMPORTANT POLICIES

It is important to draw attention to those policies of most relevance to this study. In terms of informing the emerging Calderdale Local Plan, of particular relevance is the NPPF (paragraph 124) which highlights the importance of planning policies sustaining compliance with and contributing towards EU limit values or national objectives for pollutants. Furthermore, Defra's Air Quality Plans for the achievement of EU air quality limit values for NO2 in the UK, describe the Government's plan to reduce NO2 concentrations in our towns and cities as part of its commitment for cleaner air. These plans set out targeted local, regional and national measures to ensure that UK air will be cleaner than ever before. The plans aim to build on significant improvements in air quality in recent decades and fulfil the UK's environmental responsibilities, benefit health and make the cities better places to live and work. The following criteria are considered important to this assessment and will inform the local plan:

- Proposals must demonstrate that measures can be implemented to minimise emissions to a satisfactory level if there is a likelihood to cause pollution or be exposed to potential sources of pollution;
- Within AQMAs, proposals should be consistent with the aims and objectives of the Council's Air Quality Action Plan and NPFF;
- Sites must not be located where the main traffic route to employment / schools, for example, would be through an AQMA; and
- New development should not significantly affect, or be affected by, air pollution.

3 SCOPE AND METHODOLOGY

3.1 DESK STUDY METHODOLOGY

This desk study review of potential air quality constraints has drawn upon the following readily available information:

- Review CMBC's latest air quality review and assessment report[12] and the local monitoring data presented therein;
- Review of background concentration data for the Calderdale for nitrogen dioxide (NO_2) and particulate matter (PM_{10} and $PM_{2.5}$) obtained from the DEFRA website[13];
- Review of local mapping data, the Environment Agency (EA) website[14] and MAGIC website[15] to determine the location of sources of pollution across Calderdale (e.g. major roads, railways, industry etc.); and
- Review junction capacity constraint data for Calderdale.

The scope of the assessment includes consideration of the following when producing the constraints risk mapping:

- Baseline air quality across the borough;
- Pollution Climate Mapping (PCM) modelling; and
- Junction capacity data.

3.2 BASELINE DATA

To inform this assessment, 2015 monitoring data and baseline predictions have been used and are understood to be a good indicator of air quality for the region. This is because it is highly unlikely that any areas not currently exceeding or at risk of exceeding will be introduced in the future. Where junctions are currently congested, it is important that the local plan does not introduce exposure in these areas by identifying a site for development that is adjacent to a congested junction.

3.3 POLLUTION CLIMATE MAPPING

The projections for concentrations of NO_2 across the UK have been calculated by DEFRA as part of a Pollution Climate Mapping (PCM) model assessment for the development of the 2015 Air Quality Action Plan. Those model links at risk of exceeding the EU limit values have been investigated and those areas have been utilised when mapping risk of air quality constraints. The baseline projections represent the projected concentrations assuming no further action beyond the air quality measures that were committed by the reference year (2013). As the baseline projections have been used, the assessment is conservative in approach and in all likelihood,

[12] Cornwall Council (2015). 2015 Air Quality Progress Report.
[13] DEFRA Local Air Quality Management (LAQM) Support Pages. Available at: http://laqm.defra.gov.uk/ [Accessed on 31.05.16]
[14] Environment Agency Website. Available at http://www.environmentagency.gov.uk/homeandleisure/37793.aspx. [Accessed on 31.05.16]
[15] MAGIC (2016) www.magic.gov.uk/MagicMap.aspx [Accessed on 31.05.16]

incorporation of the actions within the UK Air Quality Plan would result in lower concentrations than those considered.

3.1 JUNCTION CAPACITY DATA

Junction capacity data provided with the WSP | Parsons Brinckerhoff's Calderdale Local Plan Transport Evidence have been utilised to inform the constraints risk mapping exercise.

3.2 CONSTRAINTS RISK MAPPING

Risk of future non-compliance with air quality objectives has been considered, taking account of CMBC air quality monitoring data, PCM modelling and traffic data in terms of capacity on the network. Risk mapping has then been determined based on the following:

- **High Risk**

  Includes all areas currently within the declared Air Quality Management Areas (AQMAs) which have been declared for NO_2 exceedences of the National air quality objective.

- **Moderate Risk**

  Includes locations highlighted as at risk from exceeding the air quality objective (from PCM modelling), locations within 200m of a declared AQMA or 200m of those junctions that have been determined by the Transport Consultants as having capacity constraints. The 200m criteria has been based on the Design manual for Roads and Bridges (Volume 3, Section 3, Part 1, HA207/07, Air Quality) approach which uses 200m from affected roads as a criteria for likely affects. Beyond this distance air quality concentrations are assumed to rapidly reduce. Therefore this 200m criterion is being used as a worst case approach.

- **Low Risk**

  Includes those areas not ranked as High or Moderate.

3.3 SUMMARY OF ASSESSMENT CONSIDERATIONS

An assessment of the current air quality baseline across Calderdale has been undertaken drawing on data available from CMBC and DEFRA. Of particular relevance to the EU limit values are the projections for concentrations of NO_2 across the UK which have been calculated as part of a Pollution Climate Mapping (PCM) model assessment for the development of the 2015 Air Quality Action Plan. Those model links at risk of exceeding the EU limit values have been investigated and those areas have been utilised when mapping risk of air quality constraints.

4 BASELINE AIR QUALITY

4.1 LOCAL AIR QUALITY MANAGEMENT

The Borough of Calderdale is described as a mixed rural and urban borough, with the South Pennine Moors to the west and large areas of open countryside surrounding the urban centres of Todmorden, Halifax, Elland and Brighouse. The tourist centre of Hebden Bridge is served by the A646, which takes all the through traffic from Halifax to Lancashire. The A58 and A646 major commuter routes run through the Borough, and the M62 skirts the southern edge.

CMBC carries out a network of NO_2 monitoring across the Borough at both automatic and non-automatic sites. Monitoring is located within Sowerby Bridge, Salterhebble, Brighouse, Hipperholme and Hebden Bridge. PM_{10} is being monitored in connection with road traffic emissions and public health. This monitoring commenced in 2015, however upon writing this report the PM_{10} data was unavailable. CMBC also commenced $PM_{2.5}$ monitoring in 2016, again this data is currently unavailable.

CMBC has designated seven AQMAs (**Figure 1**) within their administrative area as a consequence of their Review and Assessment work. These have often been declared in areas where there is a combination of high traffic volumes and buildings located close to the roadside which can hinder the dispersion of exhaust fumes. The following AQMAs have been declared:

- AQMA 1: An area along the A629 between the former Stafford Arms and A340 Huddersfield Road, Salterhebble;
- AQMA 2: An area commencing adjacent to West Mills, West Street, Sowerby Bridge and extending along Town Hall Street and Wharf Street and ending in Upper Bolton Brow on Pye Nest Road and on Wakefield Road in Bolton Brow;
- AQMA 3: An area along the A646 in Hebden Bridge, commencing adjacent to Bankfoot Terrace and ending adjacent to Station Road;
- AQMA 4: An area following part of the Burnley Road through Luddenfoot;
- AQMA 5: An area encompassing parts of the Bradford and Leeds Roads and surrounding properties in Stump Cross, Halifax;
- AQMA 6: An area encompassing the main roads and surrounding buildings in the centre of Brighouse; and
- AQMA 7: Hipperholme Halifax Road/ Leeds Road crossroads

The extent of the existing AQMAs will need to be taken into account when assessing the sites for new housing development, as in compliance with the NPFF, new development should not significantly affect, or be affected by, air pollution.

4.2 LOCAL AIR QUALITY MONITORING

NO_2 CONCENTRATIONS

Concentrations of NO_2 measured across the district are provided in **Table 1** and **Table 2.**

Table 1: Local Authority Automatic Air Quality Monitoring Data

Site Name	Site Type	Annual Mean NO_2 Concentration (µg/m^3)		
		2012	2013	2014
Romon 2 (Salterhebble)	Roadside	53	48	51
Romon 3 (Hebden Bridge)	Roadside	-	-	42
Romon 4 Sowerby Bridge)	Roadside	43	42	43

At the continuous monitoring sites, the trend over the last number of years is to remain above the annual mean objective of 40µg/m^3. There was significant data loss in 2012 at the Hebden Bridge site due to flooding. This trend highlights that the annual mean objective is not being met within the declared AQMAs.

Table 2: Local Authority Diffusion Tube Air Quality Monitoring Data

Site Name	Site Type	Annual Mean NO_2 Concentration (µg/m^3)		
		2012 (F=0.79)	2013 (F=0.79)	2014 (F=0.75)
HH-LR	Roadside	Poor data capture	39	35
HH-LB	Roadside	Poor data capture	44	43
HH-LT	Roadside	Poor data capture	47	47
HB1	Roadside	47	45	44
HB6	Roadside	39	37	35
HQ1	Roadside	55	49	50
HQ9	Roadside	39	43	40
LF1	Roadside	48	48	45
LF2	Roadside	37	38	36
SB1	Roadside	53	54	51
SB3	Roadside	47	47	45
SB13	Roadside	40	40	38
SB15	Roadside	43	42	41
SB16	Roadside	41	41	41
SB18	Roadside	35	34	35
BS1	Roadside	48	47	45
BS2	Roadside	49	48	45
BS3	Roadside	50	50	46
SC5	Roadside	41	44	41
HH1	Roadside	45	43	41
WR2	Roadside	43	43	39
BH3	Roadside	51	46	44
BE4	Roadside	51	49	50
ER1	Roadside	36	37	35
HXR1	Roadside	54	50	50
AQ4	Roadside	28	28	-
AQ15	Roadside	28	32	-
CRH1	Roadside	62	58	56
CL1	Roadside	40	38	37
CL2	Roadside	42	37	35
CL-FVA	Roadside	-	Poor data capture	28
HTAH	Roadside	40	36	33
AT-BR	Roadside	39	34	31
AT-SR	Roadside	-	Poor data capture	30
LMR1	Roadside	35	Poor data capture	-
KR1	Roadside	-	-	28
AQ20	Roadside	-	-	27

*Data provided where available and with >90% data capture

The diffusion tube trends also highlight that the annual mean objective is not being met within the AQMAs, with no clear downward trend in concentrations. However, as reported in the most recent

Review and Assessment report, investigations at Keighley Road (KR1), Ainley Top (AT-BR, AT-SR), Clough Lane (CL1, CL2, CL-FVA), Hill Top Avenue (HTAH) do not show breaches outside of the AQMAs. Further investigation is therefore required at different locations outside of the AQMAs. This will be carried out as part of the regular review and assessment process.

There is one diffusion tube location identified that is close to the objective (37 µg/m^3) and is located outside of an AQMA (Diffusion Tube CL1). This tube is located to the east of Elland and within 500m of the M62 motorway.

Locations outside of the AQMAs show a general downward trend in concentrations. Annual mean NO_2 concentrations in recent years indicate that near road air quality is gradually improving. These improvements will be in part due to general reductions in oxides of nitrogen (NO_X) emissions from vehicles due to cleaner technologies.

As the majority of monitoring across Calderdale is located within AQMAs, there are certain locations where capacity issues have been identified but there is currently no air quality monitoring. It is the role of CMBC as part of their regular review and assessment process to ensure air quality is monitored effectively across the borough at locations that are unlikely to meet the air quality objectives.

There is a growing body of evidence from non-governmental organisations and testing companies, which are independent of vehicle manufactures, that on-road vehicle NO_x emissions are reducing, and that the new generation Euro 6 (VI) vehicles are delivering substantially lower NO_x emissions than previous Euro categories. In recent years the number of new diesel vehicles entering the vehicle fleet has exceeded the Department for Transport's (DfT's) forecast and this, together with the failure of previous Euro standards to deliver lower emissions, has exacerbated problems with ambient annual mean NO_2 concentrations in many urban locations in the UK and worked against local authority AQAP measures to improve local air quality. Whilst Government ministers do not currently support a proposal for diesel car scrappage scheme, this does not mean such a scheme would not be considered and implemented in future. Such a measure could substantially reduce ambient NO_2 at roadside if diesel cars are replaced with petrol or alternative low emissions technologies.

People are also increasingly choosing alternatives to the traditional combustion engine technologies when buying new vehicles; these can reduce – in the case of hybrid technology, or eliminate – in the case of electric vehicles, NO_x emissions on an individual vehicle basis. At present, the proportion of such vehicles in the fleet is relatively small; however, the increasing provision of electric vehicle charging points, reducing vehicle prices and improvements in performance should result in this proportion increasing over time.

PM_{10} CONCENTRATIONS

Monitoring was undertaken in 2015 at Wharf Street, Sowerby Bridge. This data is currently unavailable; however the requirement for this monitoring was highlighted within the 2015 Updating and Screening Assessment report. This area is therefore likely to have a certain degree of air quality constraint as it has been flagged as an area for concern due to the requirement for PM_{10} monitoring.

$PM_{2.5}$ CONCENTRATIONS

Monitoring was undertaken in 2015 at Huddersfield Road, Salterhebble, Halifax. This data is currently unavailable; however the requirement for this monitoring was highlighted within the 2015 Updating and Screening Assessment report. This area is therefore likely to have a certain degree of air quality constraint as it has been flagged as an area for concern due to the requirement for $PM_{2.5}$ monitoring.

4.3 AIR QUALITY ACTION PLAN

CMBC published its Air Quality Action Plan (AQAP) in 2009 which is due to be revised shortly. This details a number of measures proposed to reduce concentrations of NO_2 within the declared AQMAs within the district. Where further assessments have been carried out, they have reported that excess concentrations of NO_2 are derived mainly from vehicular traffic (currently reported for three out of the seven AQMAs).

The Action Plan identifies a number of key issues that must be addressed if its aims are to be achieved. These are to:

- Achieve a better understanding of the causes of poor air quality;
- Raise awareness of air quality issues;
- Identify and engage with Stakeholders;
- Develop a package of practical and achievable measures to address poor air quality;
- Indicate relative costs and benefits of these measures; and
- Establish a monitoring regime to measure progress.

As described within the Calderdale AQAP, the following measures are currently ongoing through the Local Transport Plan or other work programmes:

- Traffic monitoring and modelling;
- Air quality monitoring and modelling;
- Congestion Target Delivery Plan;
- West Yorkshire Bus Partnership;
- Metro's Rail Strategy;
- Walking and Cycling Strategies;
- Sustainable Travel Plans;
- Car Share; and
- Car Parking Strategy.

There are also general district-wide actions in place including:

- Local Air Quality Partnership;
- Information, education and travel awareness initiatives;
- Cleaner fuel technology;
- Freight Quality Partnership; and
- Planning Controls.

In addition, there are specific actions in place within three of the declared AQMAs (Salterhebble, Sowerby Bridge and Hebden Bridge):

PROPOSED ACTIONS WITHIN SALTERHEBBLE:

- Provision of bus stop lay-by facilities within the AQMA;

- Halifax-Huddersfield corridor bus/high occupancy vehicle priorities;
- Traffic queue relocation and 'pulse' flows through the AQMA; and
- Development and promotion of walking and cycle routes.

PROPOSED ACTIONS WITHIN SOWERBY BRIDGE:

- A58 Sowerby Bridge corridor bus priorities;
- Traffic queue relocation and 'pulse' flows through the AQMA; and
- Development and promotion of walking and cycling routes.

PROPOSED ACTIONS WITHIN HEBDEN BRIDGE:

- A646 Burnley Road corridor bus priorities;
- Traffic queue relocation and 'pulse' flows through AQMA; and
- Development and promotion of walking and cycling routes.

4.4 BACKGROUND AIR QUALITY DATA

4.4.1 Estimated background concentrations of NO_2, PM_{10} and $PM_{2.5}$ have been obtained from DEFRA's website, where estimated background concentrations of the pollutants included in the AQS are provided, mapped at a grid resolution of 1x1km grid squares for the whole of the UK for 2011 to 2030. **Table3** presents the range in 2016 estimated background concentrations of NO_2, PM_{10} and $PM_{2.5}$ for Calderdale. In 2016, estimated annual mean background concentrations are all well below the relevant objectives (40µg/m^3 for both NO_2 and PM_{10}, and 25µg/m^3 for $PM_{2.5}$).

Table 3: Range in 2016 DEFRA Background Concentrations (µg/m^3)

Grid Square	2016 Annual Mean Background NO_2 Concentration (µg/m^3)		
	NO_2	PM_{10}	$PM_{2.5}$
Calderdale	6.7-22.9	11.1-18.7	8.1-12.3

4.5 LOCAL EMISSION SOURCES

As reported within Calderdale's 2015 USA report, the District of Calderdale has seen a shift away from large scale manufacturing industries, as has been the case with many former manufacturing areas. However, there is still industrial activity centred on industrial estates such as Lowfields Business Park and Armytage Road, as well as smaller mixed sites across the Borough. Some of these industrial installations are controlled by environmental permits, with some being Part A1 sites regulated by the Environment Agency, including chemical manufacturers and combined heat and power plant. The Council regulates one Part A2 foundry at Todmorden, and around 75 Part B installations including petrol filling stations, quarry processes and timber and combustion installations. There is also a small waste incineration plant at the south eastern edge of the Borough.

4.6 EU LIMIT VALUE COMPLIANCE

The NPPF includes the principle that all new development, including the impact of associated traffic, should be sustainable and not significantly affect, or be affected by, air pollution. The NPFF makes more specific requirements for developments within AQMAs and to meet certain European air quality targets. As a result, compliance with the EU limit values poses a certain planning

constraint upon any new development, and reference to these limit values should be made within the new Local Plan.

The Government's plan to reduce NO_2 concentrations is set out within DEFRA's Air Quality Action Plan for achievement of EU air quality limit values for NO_2 in the UK (2015). The zone specific plan relating to Calderdale is the Air Quality Plan for the achievement of EU air quality limit value for nitrogen dioxide in Yorkshire and Humberside. The assessment undertaken for Yorkshire and Humberside non-agglomeration zone indicates that the annual limit value was exceeded in 2013 but is likely to be achieved before 2020 through the introduction of measures included in the baseline.

As part of the PCM modelling, projections for concentrations of NO_2 and NO_x across the UK in 2020, 2025 and 2030 have been calculated for the development of the 2015 Air Quality Action Plan. PCM forecast data for Calderdale has been reviewed to identify any roads that are at risk of exceeding the EU limit value. It is apparent that the roads modelled to the west do not show any risk of exceeding the EU limit value. However, to the east a number of roads have been identified as at risk of exceeding the EU limit value. These are roads with concentrations between 36 and 39 µg/m3. These roads are:

- Huddersfield Road, Brighouse;
- Huddesfield Road, Elland;
- Calderdale Way, Elland, Halifax Road, Elland;
- Elland Wood Bottom, Elland;
- Huddersfield Road, Halifax;
- Skircoat Road, Halifax;
- Cow Green, Halifax;
- Broad Street, Halifax;
- Orange Street, Halifax;
- Wharf Street, Sowerby Bridge; and
- Bolton Brow, Sowerby Bridge.

Those roads with concentrations 40 µg/m^3 and above are which are also located to the west of Calderdale are:

- M62 south of Elland;
- Wakefield Road, Brighouse;
- Huddersfield Road, Salterhebble
- Salterhebble Hill, Salterhebble
- Burdock Way, Halifax;
- Haley Hill, Halifax;
- New Bank, Halifax; and
- Godley Road, Halifax.

4.7 SUMMARY OF RELEVANCE

A review of the baseline air quality for Calderdale highlights that NO_2 concentrations are the key concern for Calderdale. However, whilst there are key areas where exceedences of the air quality objective occur for this pollutant, in general monitoring data does not show breaches outside of the AQMAs. PCM modelling does highlight roads that are not included within the AQMA that can be considered at risk from exceeding the EU limit value. These areas need to be carefully considered when looking at areas for future development. Those areas at risk will be considered when mapping constraints.

5 AIR QUALITY CONSTRAINTS

5.1 AIR QUALITY MANAGEMENT AREAS AND JUNCTION CAPACITY CONSTRAINTS

As discussed in detail in Section 4, Calderdale has seven declared AQMAs across the Borough, located in the following areas:

- Brighouse
- Hebden Bridge
- Hipperholme
- Ludden Foot
- Salterhebble and Huddersfield Road
- Sowerby Bridge
- Stump Cross

From a review of the WSP Transport Evidence Technical Note, the traffic modelling undertaken looking at a baseline situation prior to local plan growth, identifies issues of capacity constraint at the following locations:

- M62 Junction 25 Brighouse
- Brighouse Town Centre
- Hipperholme Cross Roads
- Stump Cross
- Elland Town Centre
- A629 Corridor
- Halifax Town Centre
- A6026 Lopley Lane
- Sowerby Bridge Centre
- Hebden Bridge Centre

There is a correlation between the junction capacity constraints on the network and areas of poor air quality, such that exceedences of the air quality objectives occur in these regions and as such AQMAs have been declared. Such findings are supported by the conclusions in the review and assessment report which state that excess concentrations of NO_2 are derived mainly from vehicular traffic. As stated within Section 4.6, those PCM roads identified as at risk of exceeding the EU limit value also correlate to those areas where issues of capacity constraint have been identified.

The extent of the existing AQMAs will need to be taken into account when assessing the sites for new housing development, as in compliance with the NPFF, new development should not significantly affect, or be affected by, air pollution.

Current roadside sources of pollution and capacity constraints need to also be taken into account when looking for areas to site new development, in order not to significantly impact upon these areas or result in further AQMAs.

5.2 PROPOSED TRANSPORT MITIGATION MEASURES

As identified within the Transport Report, highways interventions will consist mainly of traffic management schemes and minor alterations to junctions as a result of the constraints of topography and historic development. In town centres and major corridors, efforts might be made to encourage a modal shift to bus, rail and cycling. In certain locations, road widening or more significant junction enhancements might be possible. Interventions may be possible in Hipperholme Crossroads, Stump Cross and Brighouse Town Centre. There is also the possibility that the new junction 24a of the M62, currently being investigated by Highways England and Kirklees Council, and the Smart Motorway upgrade with an additional lane and variable speed limits between Junctions 20 and 25, may also play a role in relieving some of the capacity constrained locations.

The proposed schemes listed within the Transport Report present a variety of strategic opportunities for Calderdale. A number of these schemes are likely to lead to improvements in traffic flow, which have the potential for positive outcomes for air quality. In particular, the Halifax-Huddersfield A629 corridor improvements (as part of the West Yorkshire Plus Transport Fund project) should lead to improved traffic flow throughout the AQMA at Salterhebble. This is in line with the current Air Quality Action Plan, therefore leading to potential benefits for air quality.

5.3 CONSTRAINTS RISK MAPPING

Air quality constraints risk mapping has been produced for the borough based on AQMA and junction capacity constraint data (**Figures 2-9**). The aim for this mapping is to aid site selection for future development. The areas have been ranked as high, moderate and low in terms of air quality constraints to development (as set out in Section 3.2).

Areas that have been ranked as high in terms of air quality constraints are the seven declared AQMAs across the borough. Moderately constrained areas have been determined as those areas either within 200m of a declared AQMA or 200m of those junctions that have been determined by the Transport Consultants as having capacity constraints. The 200m criteria has been based on the Design manual for Roads and Bridges (Volume 3, Section 3, Part 1, HA207/07, Air Quality) approach which uses 200m from affected roads as a criteria for likely affects. Beyond this distance air quality concentrations are assumed to rapidly reduce. Therefore this 200m criterion is being used as a worst case approach. Low risk areas are then assumed to be those regions not ranked as high or medium risk. This approach is a high level crude assessment, air quality modelling of future traffic trends would yield more detailed results for accurate constraints risk mapping if required.

On the basis of the information available, it is highly unlikely that any areas that are not currently highlighted as a risk would become an air quality risk in the future. This is because in line with current thought regarding Euro 6 (VI) vehicles, concentrations are expected to fall.

As shown in **Figures 3-9**, the areas of High and Moderate Risk show a correlation between declared AQMAs and junction capacity constraints, which is in agreement with the findings of the review and assessment report and AQAP that areas of poor air quality are related to exceedences of NO_2 concentrations that are derived mainly from vehicular traffic.

5.4 FUTURE REQUIREMENTS FOR DEVELOPMENTS

As any new developments have the potential to affect air quality, local planning policy plays a significant role in ensuring that development schemes are designed with a sustainable approach. As stated within the Air Quality and Emissions Technical Planning Guidance document (AETPG), in order to avoid unnecessary delays in the planning process and to ensure that designs are designed appropriately and sustainably, it is vital for communication to be begun at an early stage in any significant proposal. It is important that pre-application discussions with the relevant air

quality officer are carried out to confirm the scale of development and the assessment requirements to be undertaken.

In accordance with the NPFF and PPG, when considering future development there will be a need to assess air quality to sustain compliance with and contribute towards EU limit values or national objectives for pollutants. In particular, any planning decisions should ensure any new development within an AQMA is consistent with Calderdale's AQAP.

The impact of any development upon air quality is a material planning consideration in the determination of a planning application, whereby each decision must be a balance of all material considerations depending upon the individual merits and circumstances. The weight to be given to the impact on air quality in the consideration of a planning application and the acceptability of proposed mitigation measures lies with the relevant local planning authority. Any agreed measures will be taken forward by condition where possible, or through the use of Section 106 agreements.

When assessing air quality, criteria within the 2015 EPUK/IAQM 'Land-Use Planning and Development Control: Planning for Air Quality' guidance should be used. This document includes the following threshold for requiring an air quality assessment to determine the significance of impacts on local air quality:

- A change of Light Duty Vehicles (LDV) flows of more than 100 Annual Average Daily Traffic flows (AADT) within or adjacent to an AQMA, or more than 500 AADT elsewhere.

Therefore any increase in vehicles greater than 100 AADT within or adjacent to the current seven declared AQMAs will be a trigger for assessment.

5.5 SUMMARY OF AIR QUALITY CONSTRAINTS

It is identified that AQMAs have often been declared in areas where there is a combination of high traffic volumes and buildings located close to the roadside which can hinder the dispersion of exhaust fumes. Local air quality monitoring data shows exceedences of the annual mean NO_2 concentration objective are only occurring within these AQMAs.

Junction capacity constraints have also been identified and are located in key population areas of Calderdale. It is clear from this review that there is a correlation between the junction capacity constraints on the network and areas of poor air quality.

6 FUTURE OPPORTUNITIES

6.1 SITE SELECTION

When considering future land allocations for development within the Borough as part of the emerging Local Plan process, consideration should be given to current roadside sources of pollution. A review of the high level air quality constraints risk mapping it would appear that sites to the western side of Calderdale would be favourable in terms of least air quality constraints. However, from understanding the junction capacity constraints on the network and conclusions within the Transport Evidence, it is apparent that the eastern side of Calderdale has preferential status for development. As larger towns are already located in the east, this area can be considered a more sustainable location for future development. This is because there is a greater opportunity for improved sustainable transport and highway constraints appear to be more readily improved in the east of Calderdale. Such measures work positively with air quality thus limiting constraints in this region. The eastern side of Calderdale is also heavily influenced by the local plans of Kirklees and Bradford.

It is important that any new development within Calderdale aims to minimise the risk from all forms of pollution and contamination for existing and future occupants, the wider community and the environment, particularly within the declared Air Quality Management Areas. Any Local Plan therefore needs adequate development policies incorporated in relation to Pollution Control. Requirements should therefore be put in place whereby:

- Development proposals with the likelihood to cause pollution or be exposed to potential sources of pollution will need to demonstrate that measures can be implemented to minimise emissions to a satisfactory level; and
- Within AQMAs, proposals should be consistent with the aims and objectives of the Council's Air Quality Action Plan and NPFF.

7 SUMMARY

This technical note has set out the key air quality elements to be considered when assessing the possible options for development within the emerging Local Plan. The Local Plan will need to identify land areas across the borough for future development and as such will need to include a number of strategic and development policies relating to local air quality management that will fulfil the NPFF sustainable development criteria.

A baseline review of existing air quality across the borough of Calderdale has been undertaken to ascertain any air quality constraints for assessing areas for development within the emerging Calderdale Local Plan. This technical note is designed to act as a starting point for decision making as to the location of future land allocations for development within the borough, and will be used to inform the decision making process that will create the draft Local Plan.

Some key themes emerge from this desk based review in terms of air quality and constraints across the Borough. These are listed below:

- CMBC has designated seven AQMAs within their administrative area as a consequence of their Review and Assessment work;
- AQMAs have been declared in areas where there is a combination of high traffic volumes and buildings located close to the roadside which can hinder the dispersion of exhaust fumes;
- Local air quality monitoring data shows exceedences of the annual mean NO_2 concentration objective are only occurring within these AQMAs;
- Junction capacity constraints are identified in key population areas of Calderdale;
- There is a correlation between the junction capacity constraints on the network and areas of poor air quality;
- Local planning policy plays a significant role in ensuring that development schemes are designed with a sustainable approach;
- Pre-application discussions with the relevant air quality officer will be important to confirm the scale of development and the assessment requirements to be undertaken as part of any planning application process;
- There will be a need to assess air quality to sustain compliance with and contribute towards EU limit values or national objectives for pollutants as part of any planning application process;
- It is apparent that the eastern side of Calderdale has preferential status for development;
- Any Local Plan needs adequate development policies incorporated in relation to Pollution Control;
- Development proposals with the likelihood to cause pollution or be exposed to potential sources of pollution will need to demonstrate that measures can be implemented to minimise emissions to a satisfactory level; and
- Within AQMAs, proposals should be consistent with the aims and objectives of the Council's Air Quality Action Plan and NPFF.

Appendix A

AIR QUALITY GLOSSARY

APPENDIX A-1

AIR QUALITY GLOSSARY

APPENDIX A – AIR QUALITY GLOSSARY

TERM	DEFINITION
AADT Annual Average Daily Traffic	A daily total traffic flow (24 hrs), expressed as a mean daily flow across all 365 days of the year.
Air quality objective	Policy target generally expressed as a maximum ambient concentration to be achieved, either without exception or with a permitted number of exceedences within a specific timescale (see also air quality standard).
Air quality standard	The concentrations of pollutants in the atmosphere which can broadly be taken to achieve a certain level of environmental quality. The standards are based on the assessment of the effects of each pollutant on human health including the effects on sensitive sub groups (see also air quality objective).
Annual mean	The average (mean) of the concentrations measured for each pollutant for one year.
AQMA	Air Quality Management Area.
DEFRA	Department for Environment, Food and Rural Affairs.
Exceedence	A period of time where the concentrations of a pollutant is greater than, or equal to, the appropriate air quality standard.
LAQM	Local Air Quality Management.
NO_2	Nitrogen dioxide.
NO_x	Nitrogen oxides.
PM_{10}	Particulate matter with an aerodynamic diameter of less than 10 micrometres.
$PM_{2.5}$	Particulate matter with an aerodynamic diameter of less than 2.5 micrometres.
Trackout	Trackout is defined as the transport of dust and dirt from the construction/demolition site onto the public road network, where it may be deposited and then re-suspended by vehicles using the network

Appendix B

RELEVANT UK AIR QUALITY STRATEGY OBJECTIVES

APPENDIX B-1

RELEVANT UK AIR QUALITY STRATEGY OBJECTIVES

APPENDIX B – RELEVANT UK AIR QUALITY STRATEGY OBJECTIVES

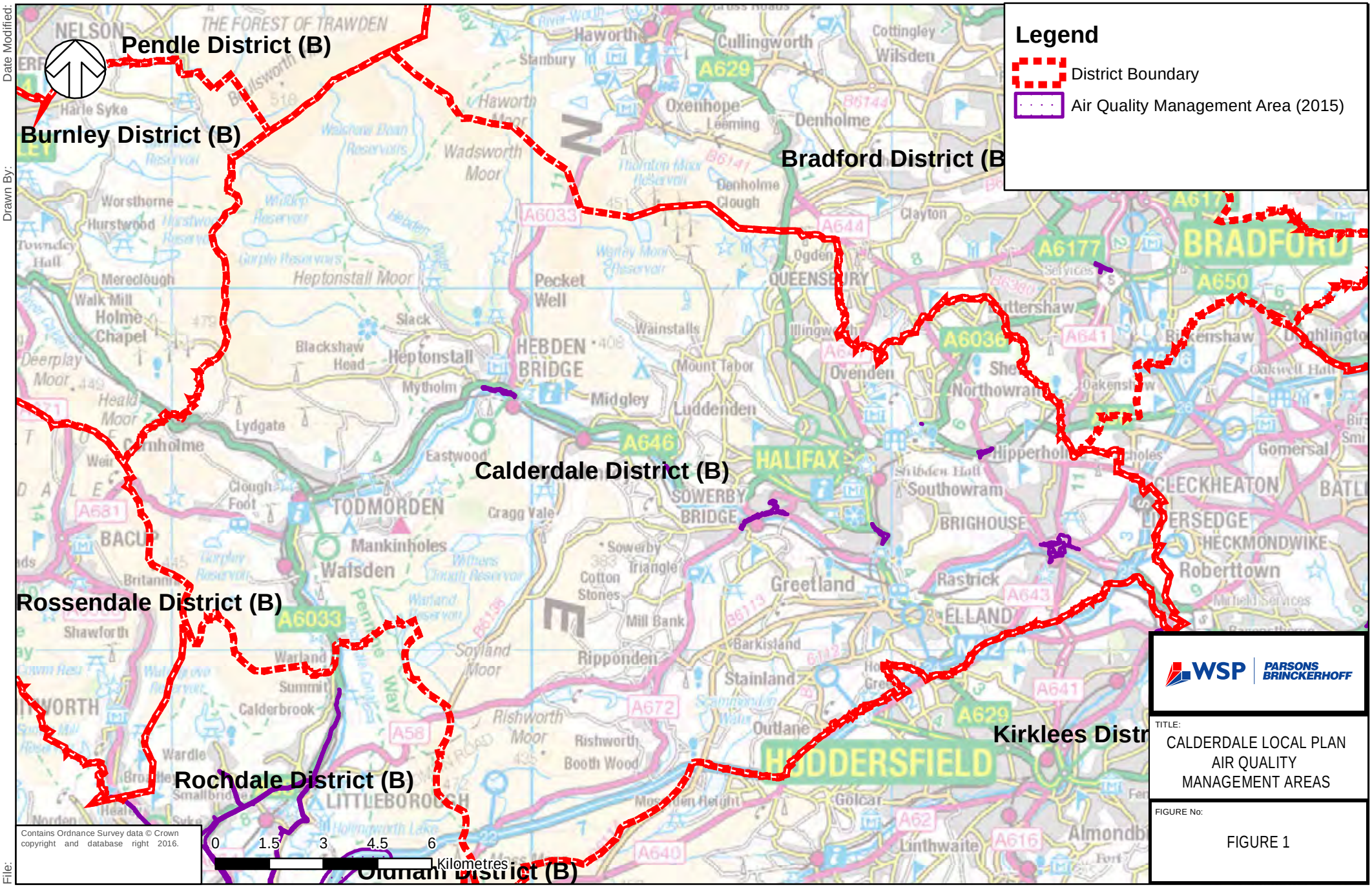
National Air Quality Objectives and European Directive Limit Values for the protection of human health						
Pollutant	Applies to	Objective	Measured as	Date to be achieved by and maintained thereafter	European Obligations	Date to be achieved by and maintained thereafter
Nitrogen dioxide (NO_2)	UK	200µg/m^3 not to be exceeded more than 18 times a year	1 hour mean	31.12.2005	200µg/m^3 not to be exceeded more than 18 times a year	01.01.2010
	UK	40µg/m^3	annual mean	31.12.2005	40µg/m^3	01.01.2010
Particulate Matter (PM_{10}) (gravimetric)[A]	UK (except Scotland)	40µg/m^3	annual mean	31.12.2004	40µg/m^3	01.01.2005
	UK (except Scotland)	50µg/m^3 not to be exceeded more than 35 times a year	24 hour mean	31.12.2004	50µg/m^3 not to be exceeded more than 35 times a year	01.01.2005
Particulate Matter ($PM_{2.5}$)	UK (except Scotland)	25µg/m^3	annual mean	2020	Target value 25µg/m^3	2010

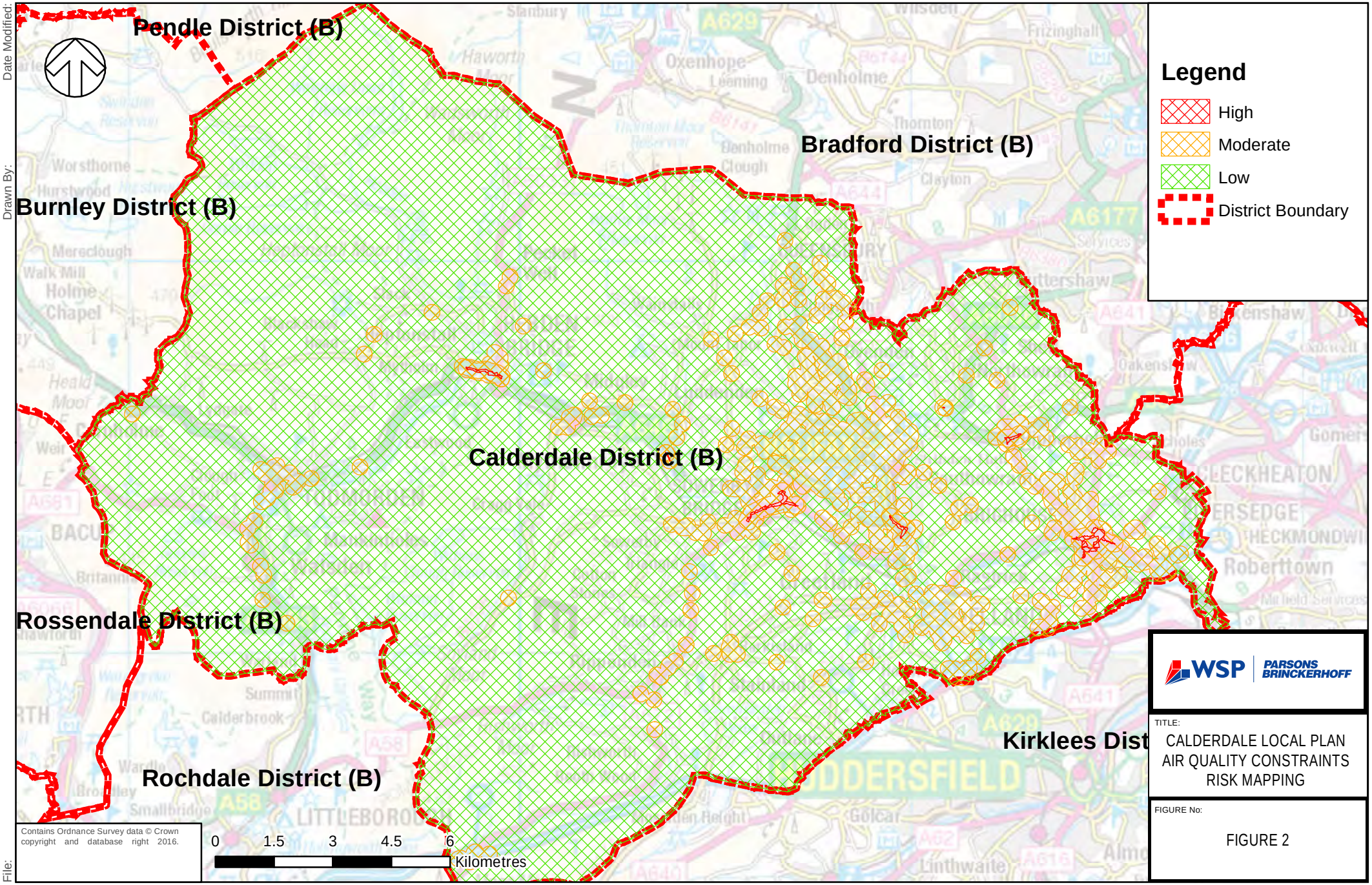
Appendix C

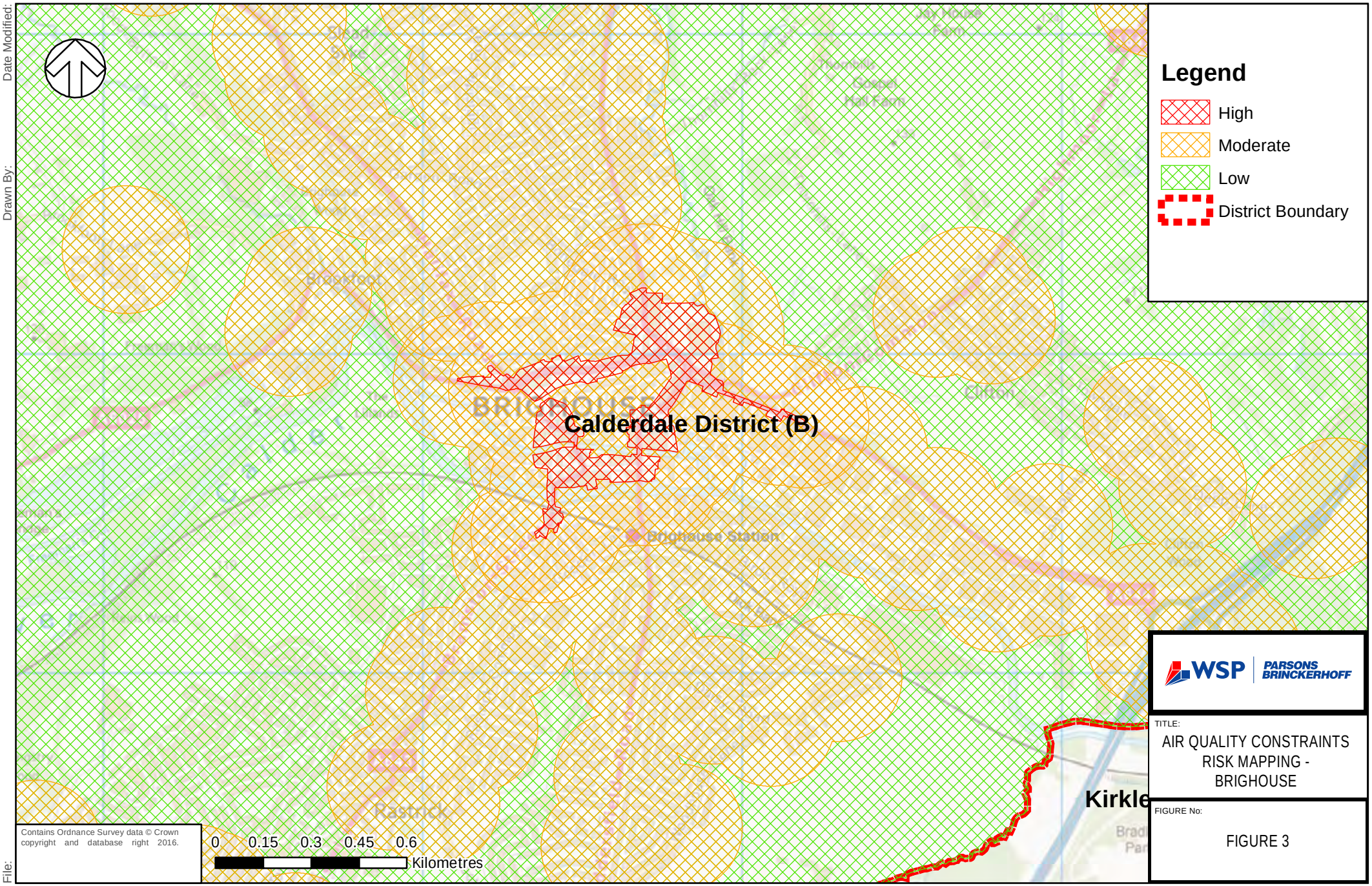
AIR QUALITY FIGURES

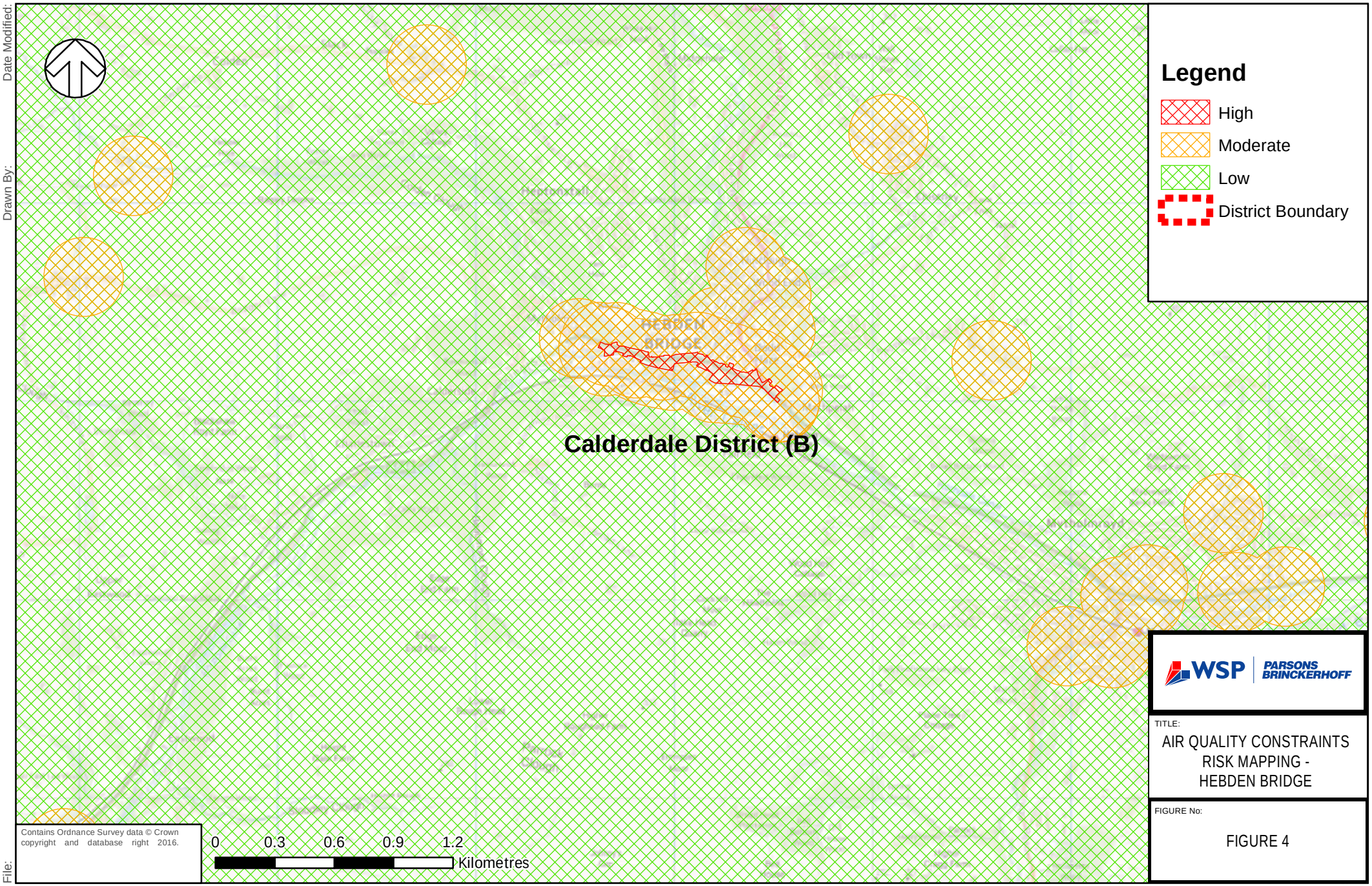
APPENDIX C-1

AIR QUALITY FIGURES


Pendle District (B)
Burnley District (B)
Bradford District (B
Calderdale District (B)
Rossendale District (B)
Rochdale District (B)
Kirklees Distr
Oldham District (B)
Legend
District Boundary
Air Quality Management Area (2015)
Contains Ordnance Survey data © Crown copyright and database right 2016.
0 1.5 3 4.5 6
Kilometres
Date Modified:
Drawn By:
File:
WSP | PARSONS BRINCKERHOFF
TITLE:
CALDERDALE LOCAL PLAN
AIR QUALITY
MANAGEMENT AREAS
FIGURE No:
FIGURE 1

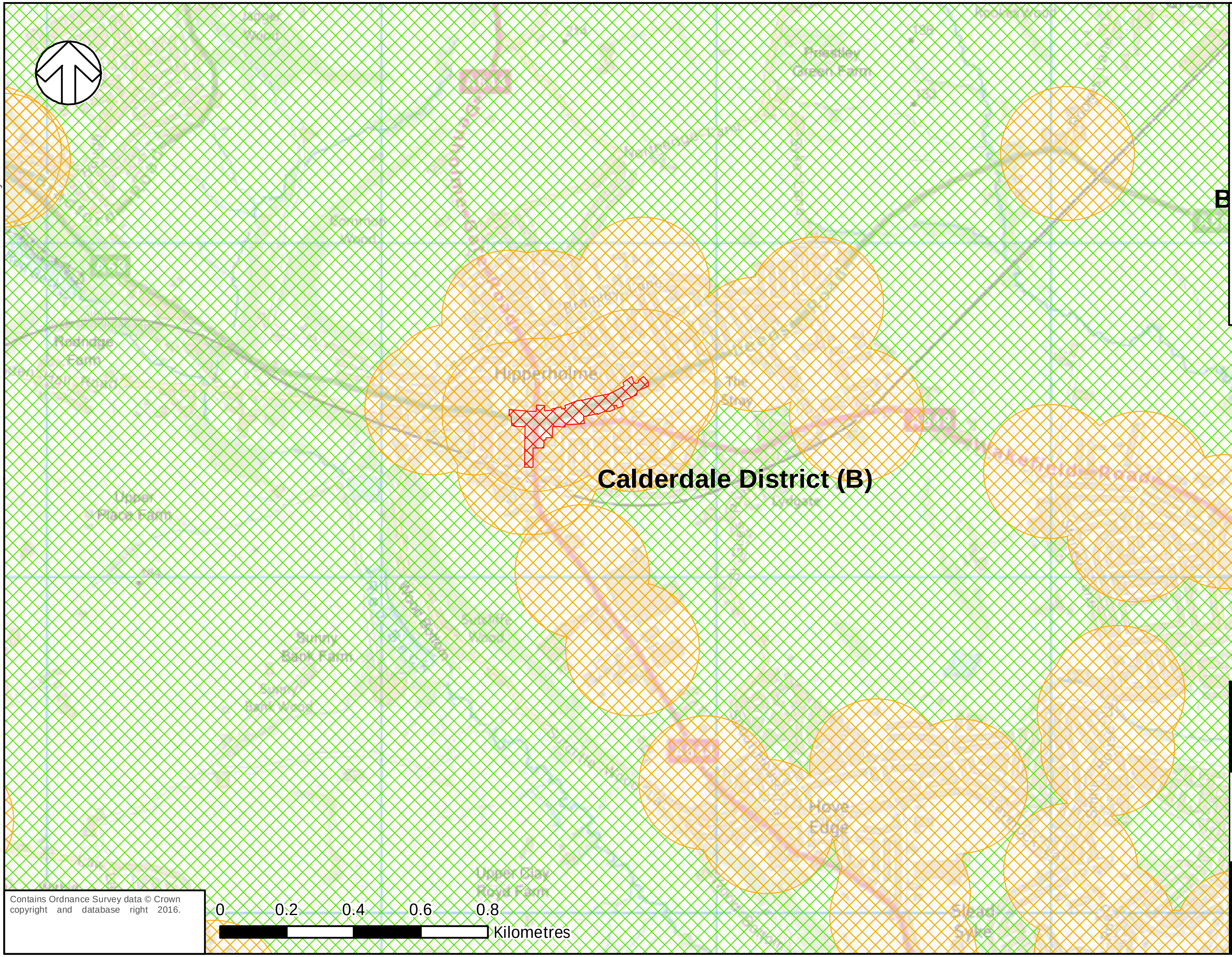

Pendle District (B)
Bradford District (B)
Burnley District (B)
Calderdale District (B)
Rossendale District (B)
Rochdale District (B)
Kirklees Dist
Legend
High
Moderate
Low
District Boundary
Contains Ordnance Survey data © Crown copyright and database right 2016.
0
1.5
3
4.5
6
Kilometres
WSP
PARSONS BRINCKERHOFF
TITLE:
CALDERDALE LOCAL PLAN
AIR QUALITY CONSTRAINTS
RISK MAPPING
FIGURE No:
FIGURE 2
Date Modified:
Drawn By:
File:


Date Modified:
Drawn By:
File:
Legend
High
Moderate
Low
District Boundary
Calderdale District (B)
BRIGHOUSE
Brighouse Station
Rastrick
Kirkle
Contains Ordnance Survey data © Crown copyright and database right 2016.
0 0.15 0.3 0.45 0.6
Kilometres
WSP | PARSONS BRINCKERHOFF
TITLE:
AIR QUALITY CONSTRAINTS RISK MAPPING - BRIGHOUSE
FIGURE No:
FIGURE 3


Date Modified:
Drawn By:
File:
Legend
High
Moderate
Low
District Boundary
Calderdale District (B)
HEBDEN BRIDGE
Contains Ordnance Survey data © Crown copyright and database right 2016.
0
0.3
0.6
0.9
1.2
Kilometres
WSP
PARSONS BRINCKERHOFF
TITLE:
AIR QUALITY CONSTRAINTS RISK MAPPING - HEBDEN BRIDGE
FIGURE No:
FIGURE 4

Date Modified:

Drawn By:



Contains Ordnance Survey data © Crown copyright and database right 2016.

File:

Legend

- High
- Moderate
- Low
- District Boundary

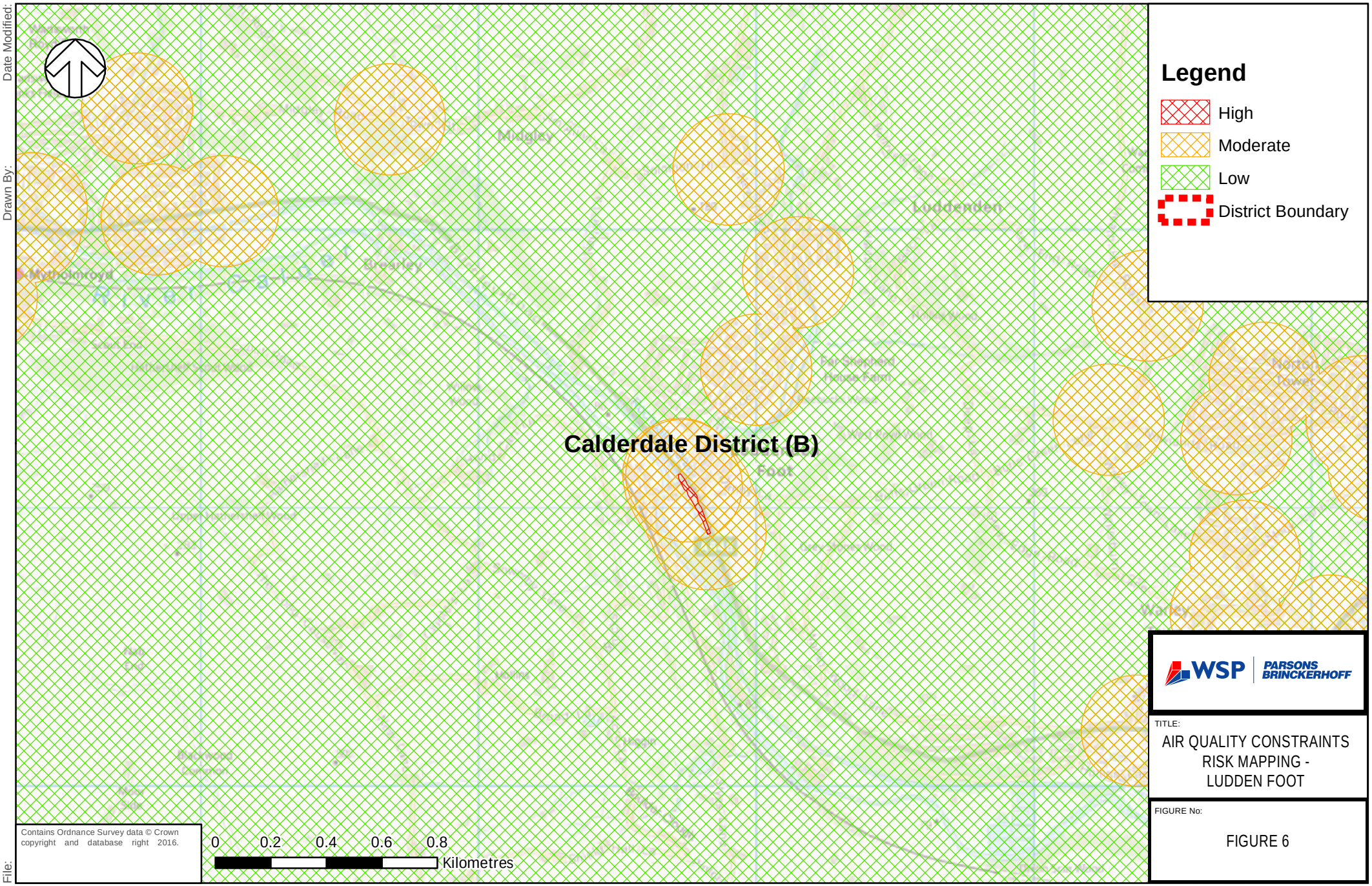
WSP | PARSONS BRINCKERHOFF

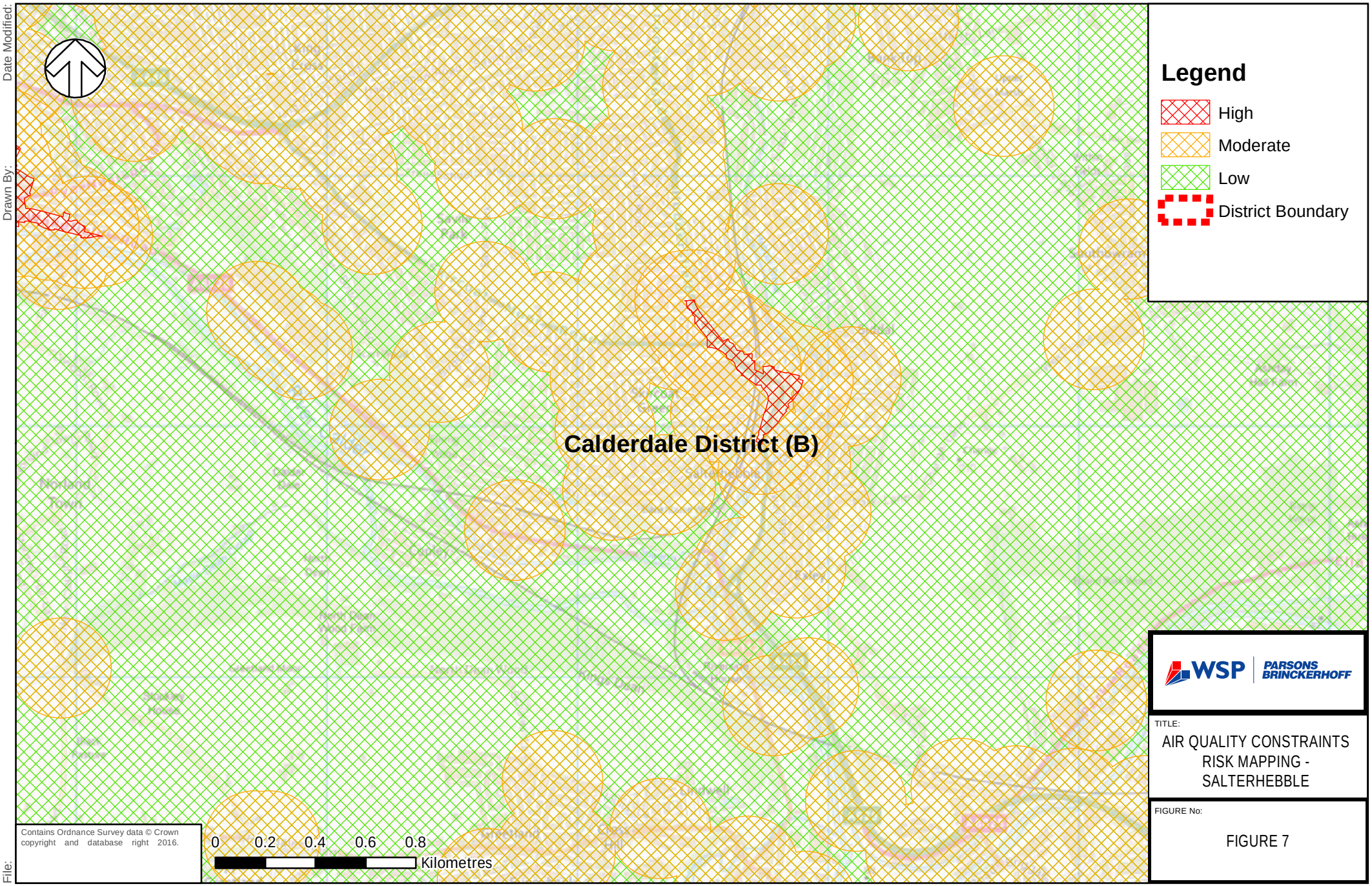
TITLE:

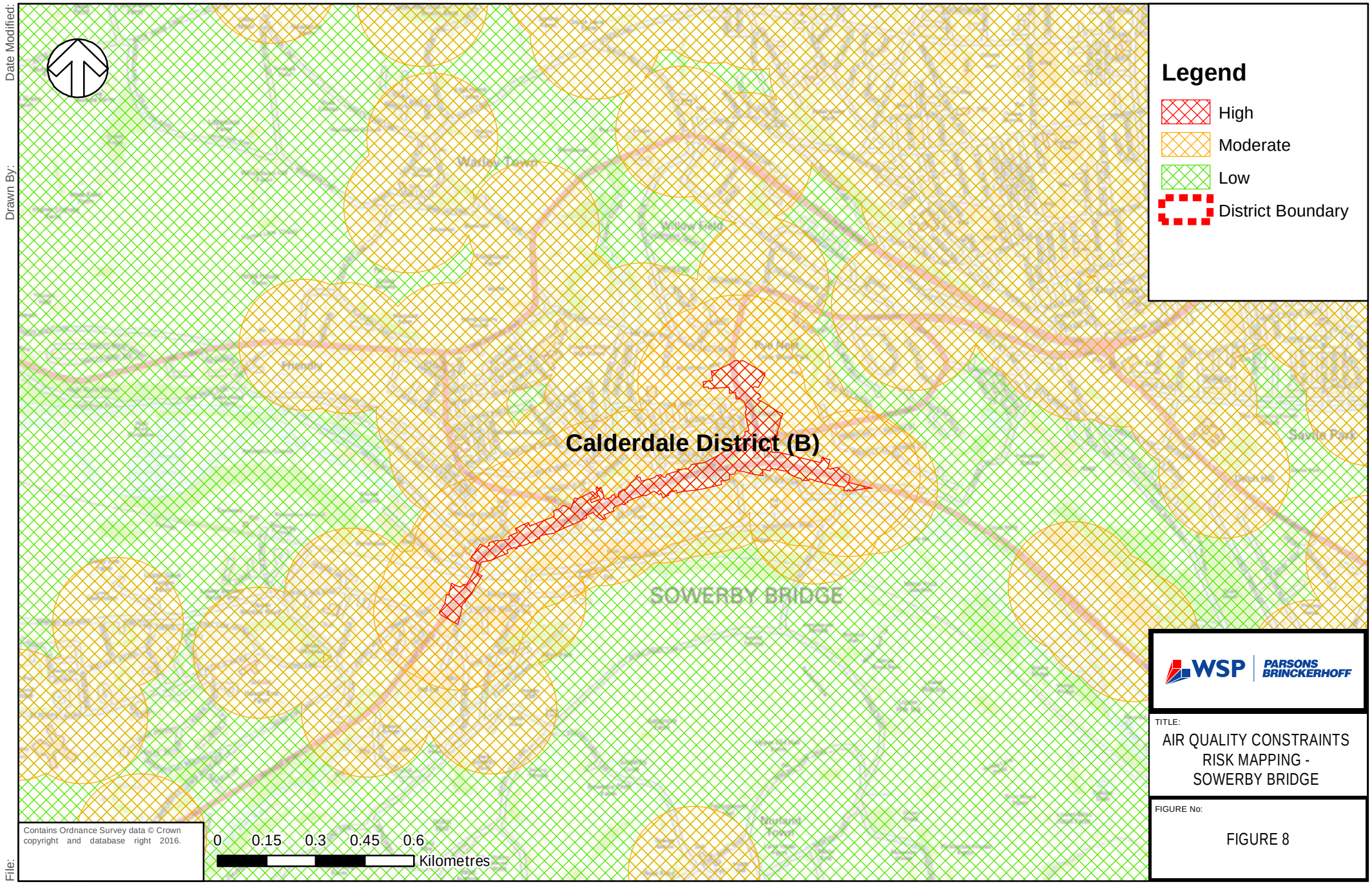
AIR QUALITY CONSTRAINTS RISK MAPPING - HIPPERHOLME

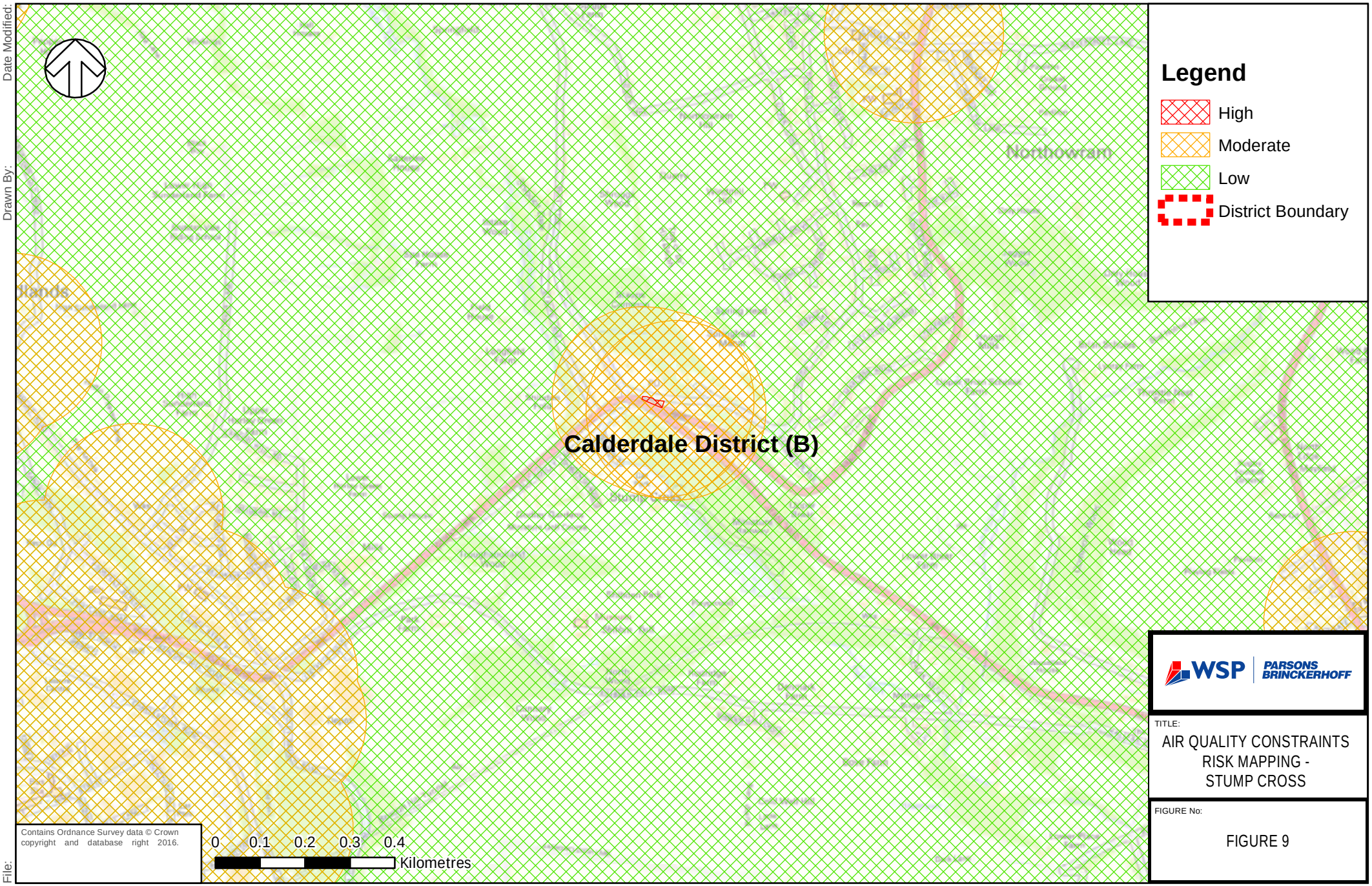
FIGURE No:

FIGURE 5


Date Modified:
Drawn By:
File:
Legend
High
Moderate
Low
District Boundary
Calderdale District (B)
Contains Ordnance Survey data © Crown copyright and database right 2016.
0
0.2
0.4
0.6
0.8
Kilometres
WSP
PARSONS BRINCKERHOFF
TITLE:
AIR QUALITY CONSTRAINTS RISK MAPPING - LUDDEN FOOT
FIGURE No:
FIGURE 6


Calderdale District (B)
Legend
High
Moderate
Low
District Boundary
0 0.2 0.4 0.6 0.8
Kilometres
Contains Ordnance Survey data © Crown copyright and database right 2016.
WSP | PARSONS BRINCKERHOFF
TITLE:
AIR QUALITY CONSTRAINTS RISK MAPPING - SALTERHEBBLE
FIGURE No:
FIGURE 7
Date Modified:
Drawn By:
File:


Date Modified:
Drawn By:
File:
Legend
High
Moderate
Low
District Boundary
Calderdale District (B)
SOWERBY BRIDGE
Warley Town
Ripponden
Contains Ordnance Survey data © Crown copyright and database right 2016.
0 0.15 0.3 0.45 0.6
Kilometres
WSP
PARSONS BRINCKERHOFF
TITLE:
AIR QUALITY CONSTRAINTS RISK MAPPING - SOWERBY BRIDGE
FIGURE No:
FIGURE 8


Date Modified:
Drawn By:
File:
Legend
High
Moderate
Low
District Boundary
Calderdale District (B)
Northowram
Hands
Contains Ordnance Survey data © Crown copyright and database right 2016.
0 0.1 0.2 0.3 0.4
Kilometres
WSP
PARSONS BRINCKERHOFF
TITLE:
AIR QUALITY CONSTRAINTS RISK MAPPING - STUMP CROSS
FIGURE No:
FIGURE 9