Report to the Cleaner, Greener and Safer Communities Scrutiny Committee

4th March 2015

Air Pollution and Traffic Light Sequencing

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Introduction

Members have requested information relating to air pollution creation and dispersal in relation to vehicles at traffic lights and the impact of traffic light sequencing.

Background

On 15th January 2015 the Borough Council declared four air quality management areas (AQMAs) in respect of nitrogen dioxide, these are at the following locations and the full extent of the AQMA declared is shown on the maps in Appendix 1:

- Liverpool Road, Kidsgrove
- Newcastle under Lyme Town Centre
- Maybank, Wolstanton and Porthill Bank
- 2 dwellings at Little Madeley adjacent to the M6 motorway

The statutory limit for nitrogen dioxide is 40µg m^3 and the pollution is primarily created from vehicles.

Questions to be Addressed

What is currently being done in relation to air quality?

Declaration of Air Quality Management Areas – January 2015
Following a consultation exercise, your officers prepared a report to public protection committee concerning the recommended AQMA's detailing the adopted consultation methodology, the findings of the consultation exercise and a recommended Air Quality Management Area order detailing the boundary of the AQMA in each of the affected area for formal adoption by the council.

What is the future work relating to air quality?

Preparation and adoption of Air Quality Action Plans – Within 18 months of declaring an AQMA
Following the declaration of the air quality management areas, the Council will need to develop and adopt an Air Quality Action Plan with key stakeholders for each of the affected areas. The local authority is then required to produce an 'action plan' to demonstrate how the Authority intends to work towards meeting the air quality objectives within its Air Quality Management Area. By necessity a number of partners will need to be involved in developing the Air Quality Action Plan and identifying agreed measures and timescales for implementation. As the pollution is vehicle related significant input from the highway authorities will be necessary.

Action plans are required to be submitted to DEFRA within a maximum of 18 months from the declaration of an AQMA. Progress against the action plan and compliance with the relevant pollutant objectives is required to be reported annually to DEFRA in the air quality report for the preceding calendar year.

Air Quality and Planning
The National Planning Policy Framework (NPPF) recognises that the planning system has an important role to play in improving air quality. To this end the NPPF advises the following:

"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."

Air Quality thus becomes a material consideration concerning any of the parameters set out in the NPPF.

Officers within the Environmental Protection Team currently assess applications for development in the Borough for their impact upon local air quality and in appropriate circumstances will require the developer to submit an appropriate air quality impact assessment for consideration and comment. Appropriate recommendations are then made to the relevant planning authority concerning the development.

How do traffic lights affect levels of pollution?

Vehicles with petrol and diesel driven internal combustion engines are sources of air pollution. Until alternative engine technology will replace petrol and diesel driven engines, road transportation will continue to be a major source for emissions of nitrogen dioxide, carbon monoxide, carbon dioxide, hydrocarbons, and many other organic compounds into the environment.

There is a direct relation between a vehicles emissions and its acceleration: an accelerating vehicle will pollute more than a non-speeding vehicle. However, studies have also shown that the number of emissions actually decreased when a vehicle is slowing down to stop at lights, compared to the number had it just cruised past without stopping at all.
Using a "line source" method, it has been found that the number of particles emitted when a vehicle is forced to stop and start at a red light is much higher than when it travels past the light without stopping.

What could be done to reduce air pollution at traffic lights?

As the pollution levels are reduced when there is less stop-start at traffic lights (roundabouts, pelican crossings, congestion etc) one solution lies with improving or smoothing the flow of traffic, so that both the number of vehicles is reduced and also stop-start is reduced as much as possible.

There have been a number of projects undertaken to consider these issues such as the use of intelligent traffic lights, mobile devices and wireless communication to reduce vehicle emissions. The solution minimises the number of stop-starts due to the red light and the accelerations needed to catch the green light (happening quite frequent and having an important influence on the emissions rate).

Intelligent traffic light signalling systems, provide a significant amount of improvement in traffic flow and a reduction in the level of vehicular emissions.

In the Netherlands a new measure is developed which is called 'Drive Slow Go Faster' (DSGF). The method increases the energy efficiency of the traffic system, because it aims at both speed reduction and a more even speed by all vehicles. This is done by a (re)design of the road itself and its environs in such a way that cars cannot overtake anymore (one lane for each way with a barrier between the lanes) and that the cars will be forced to drive at a lower speed (by designing smaller lanes). Dutch experience (in the city of Hilversum) has shown that the concept can save upto 26% of energy in relation to the current situation. Because of the speed reduction and the more even speed, next to the energy saving (and CO2 reduction), such a design reduces the other negative impacts of traffic, e.g. NOx and noise and traffic safety.

What other measures can be used to improve air quality?

There are a whole range of measures that can be implemented at both a national and local level to maintain and improve the air quality, such measures can include:

- Education – public & businesses, using fuel efficient driving techniques
- Reducing reliance of vehicles
- Green travel including walking, cycling, use of public transport
- Traffic smoothing and reducing congestion
- Land use planning and planning policy
- Clean vehicle technology
- Hybrid/electric vehicles
- Vehicle restrictions
- Congestion charging

Constraints

This work is undertaken within a specific statutory regime with associated technical guidance to assist in the completion of the work.

All work relating to air quality is independently reviewed and validated by DEFRA.

Although the Borough has a statutory duty in relation to air quality, in these cases as the pollution is primarily created by vehicles and the associated highway network. Staffordshire County Council is the responsible Highways Department and the Highways Agency is responsible for the motorway network. Therefore the air quality action plan which will detail the monitoring and management arrangements cannot be developed alone. Work is commencing on developing a work group to start the action planning process.

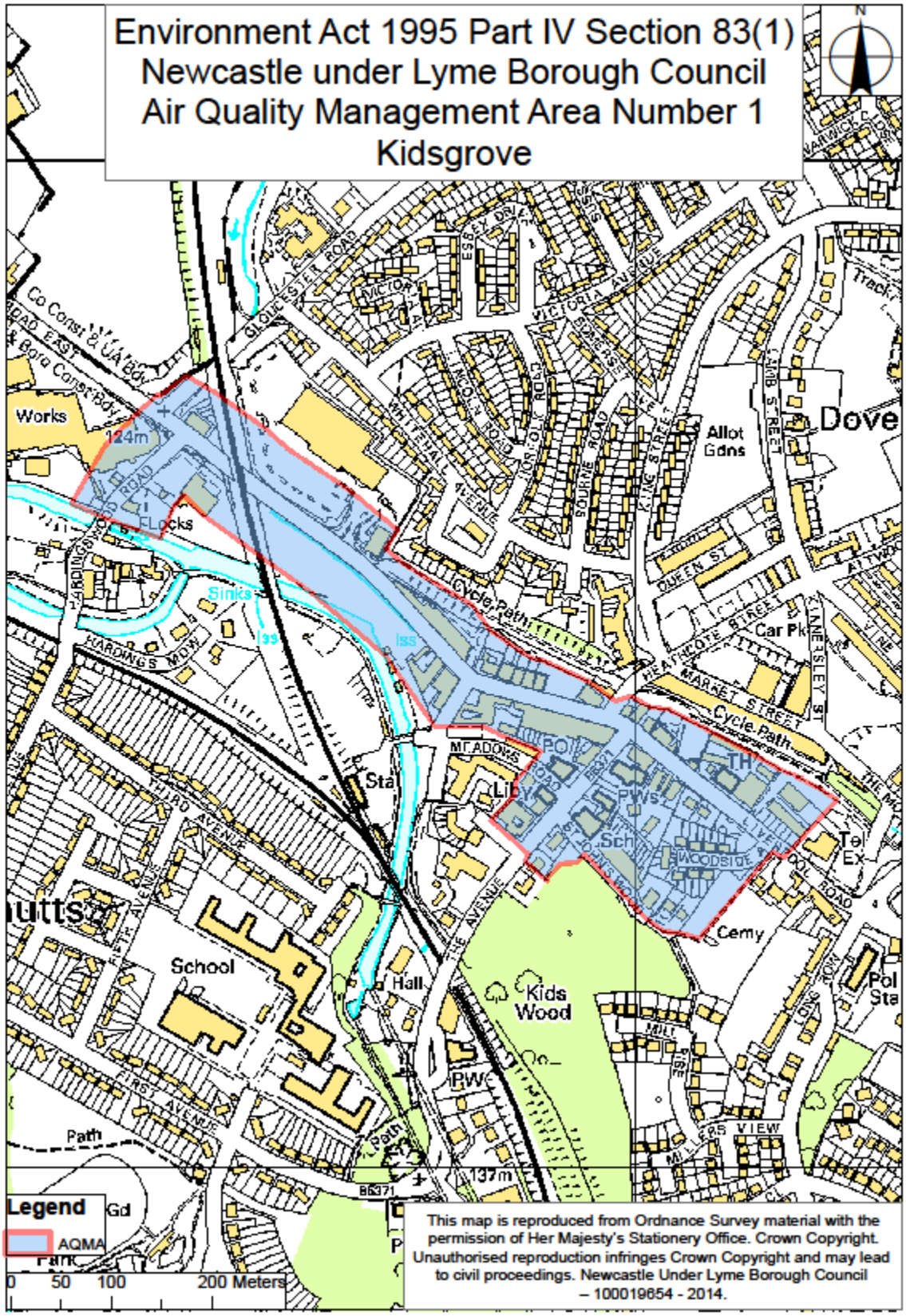
Conclusions
The process of monitoring and assessing air quality and introducing AQMAs is complex, but this work is underway and support is being received from consultants.

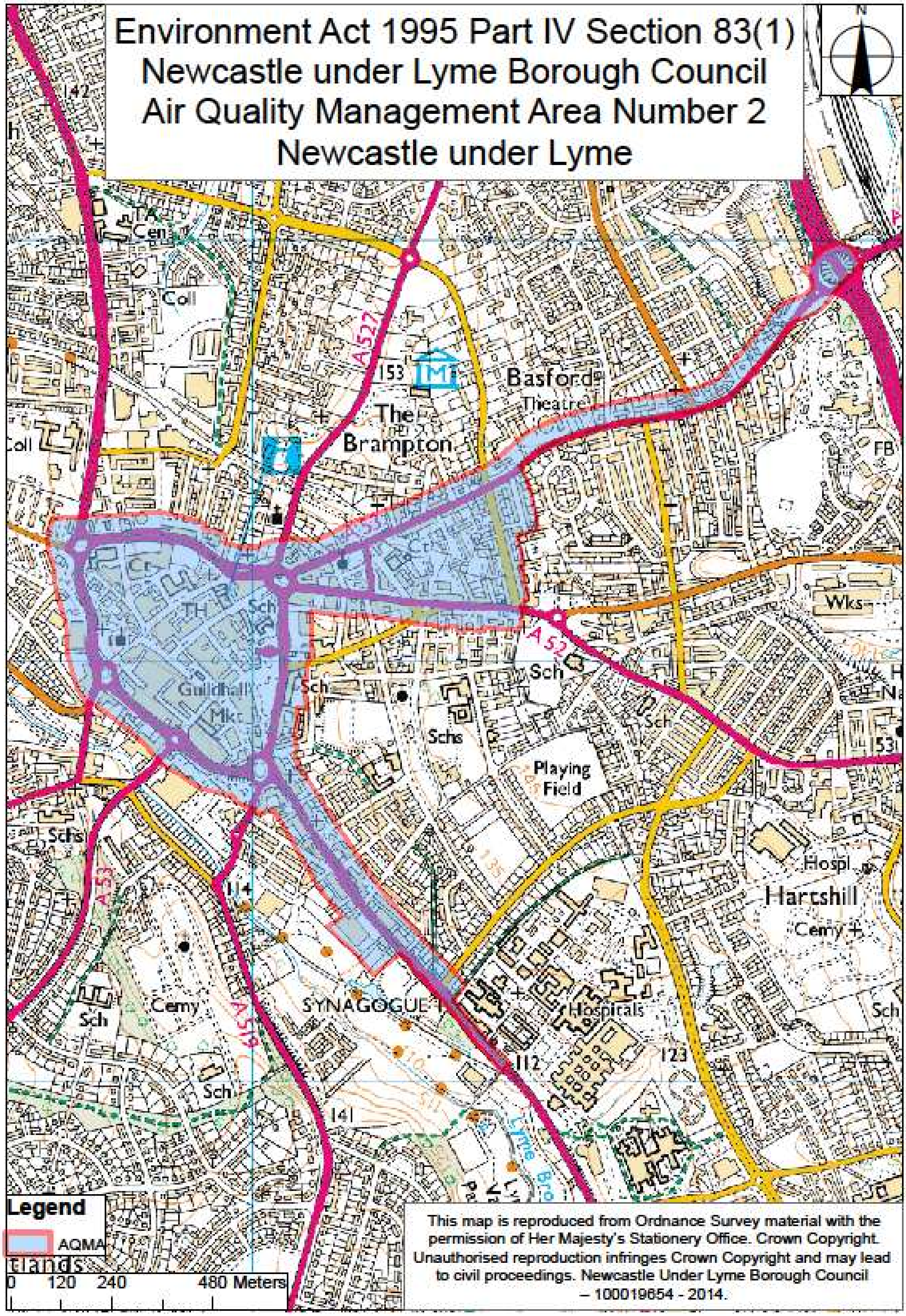
The authority upon completion of the declaration of AQMAs and the creation of the action plan will have robust plans on how to improve air quality within the designated areas. Due to the pollution being vehicle created, significant work with the highways authorities will be undertaken to bring about the improvements necessary.

We propose to continue to actively monitor and promote controls to improve air quality in accordance with our statutory requirements.

Relevant Portfolio Holder
Environment & Recycling – Ann Beech

Appendix 1- AQMA maps




Environment Act 1995 Part IV Section 83(1)
Newcastle under Lyme Borough Council
Air Quality Management Area Number 2
Newcastle under Lyme
N
Basford
Theatre
The Brampton
A527
A53
A52
A519
Guildhall
Mkt
TH
Sch
Schs
Playing Field
Hospl
Hartshill
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Hospitals
SYNAGOGUE
Wks
Coll
Legend
AQMA
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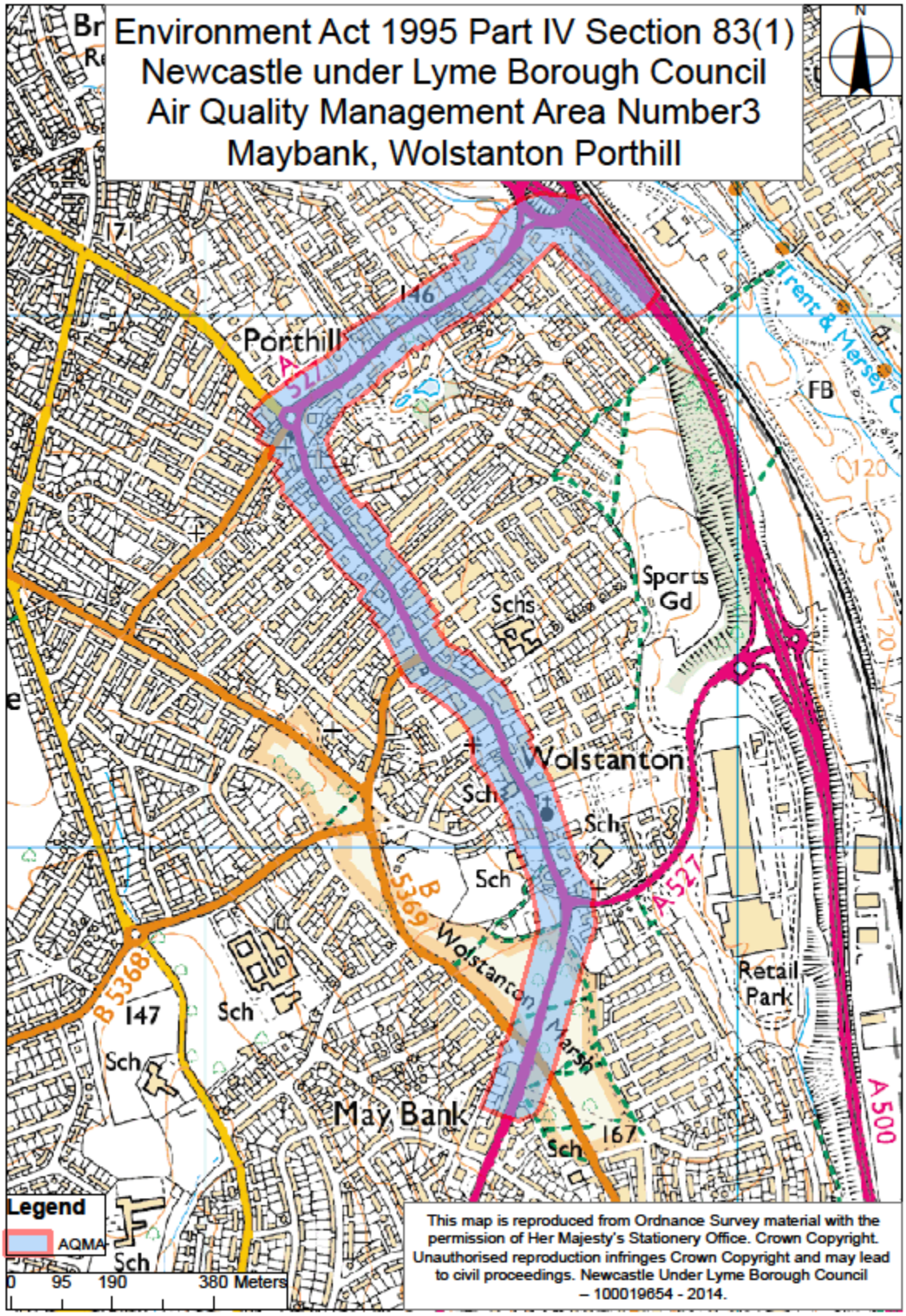
Environment Act 1995 Part IV Section 83(1)
Newcastle under Lyme Borough Council
Air Quality Management Area Number3
Maybank, Wolstanton Porthill
N
Porthill
A527
146
171
Trent & Mersey C
FB
120
Sports Gd
Schs
Wolstanton
Sch
B5369
Wolstanton Marsh
Retail Park
A500
B5368
147
May Bank
167
Legend
AQMA
0 95 190 380 Meters
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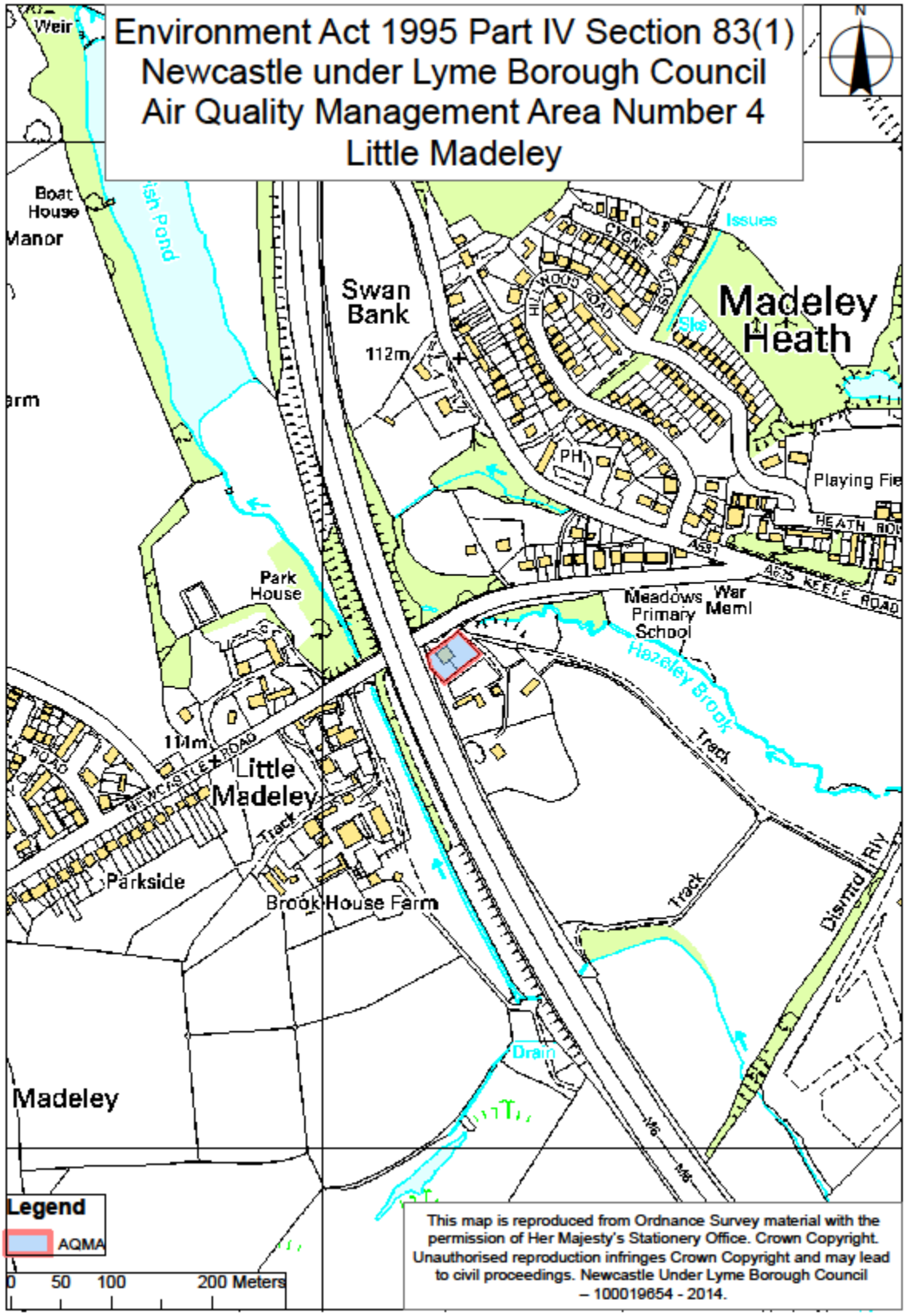
Environment Act 1995 Part IV Section 83(1)
Newcastle under Lyme Borough Council
Air Quality Management Area Number 4
Little Madeley
N
Weir
Boat House
Manor
Fish Pond
Swan Bank
112m
Issues
Madeley Heath
Sks
PH
Playing Fie
HEATH ROAD
A525 KEELE ROAD
Park House
Meadows Primary School
War Meml
Hazeley Brook
Track
111m
NEWCASTLE ROAD
Little Madeley
Parkside
Brook House Farm
Track
Track
Dismtd Rly
Drain
Madeley
M6
M6
Legend
AQMA
0 50 100 200 Meters
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