

WREXHAM COUNTY BOROUGH
COUNCIL

AIR QUALITY REVIEW AND
ASSESSMENT

PROGRESS REPORT
2003 & 2004

Executive Summary

This report has been prepared as part of Wrexham County Borough Councils (WCBC) Air Quality Management Strategy as required under the Environment Act 1995. The overall aims of this report are to:

- Report progress on the implementation of the Local Air Quality Management (LAQM) plan
- Report progress in maintaining the pollution concentrations below the Air Quality objectives (see Appendix 1)

This report has been prepared in accordance with Progress Report Guidance LAQM.PRG(03).

The Updating and Screening Assessment (USA) for 2002 concluded that:

Results of the screening assessment have shown that no detailed assessment is required with respect to emissions arising from all sources assessed – predictions of air quality in relevant future years indicate that the current air quality objectives will be met at all receptors in Wrexham County Borough Council

The USA also stated that:

- WCBC will continue its monitoring program to confirm the findings of the report.
- Further work will be undertaken with respect to the performance of diffusion tubes through the use of triplicate tubes at the continuous roadside-monitoring site.

This progress report concludes:

- 1) The findings of the 2002 USA continue to remain valid.
- 2) There has not been a change in local circumstances, which may indicate a possible exceedence.

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Introduction

This report has been prepared by Wrexham County Borough Council as part of its obligations under the Environmental Protection Act, 1995, to assess local air quality.

Part IV of the Environment Act, 1995, places a statutory duty on local authorities to periodically review and assess the air quality within their area. This involves consideration of present and likely future air quality, against air quality standards and objectives. Guidelines for the 'Review and Assessment' of local air quality were published in the 1997 National Air Quality Strategy (NAQS) and associated guidance and technical guidance. In 2000 the Government reviewed the NAQS and set down a revised Air Quality Strategy (AQS) for England, Scotland, Wales and Northern Ireland. This set down a revised framework for air quality standards and objectives for seven pollutants, which were subsequently set in Regulation in 2000 through the Air Quality (Wales) Regulations 2000. These were subsequently amended in 2002. The National Assembly for Wales has responsibility for meeting air quality objectives in Wales by their target dates.

The progress report is designed to:

- Report progress on the implementation of the Local Air Quality Management (LAQM) plan
- Report progress in maintaining the pollution concentrations below the Air Quality objectives (see Appendix 1)

This report has been prepared in accordance with Progress Report Guidance LAQM.PRG(03).

Summary of Previous Review and Assessment Work

The **first stage** of review and assessment was carried out in 1999 / 2000 and made the following recommendation:

This report has identified two pollutants, particulates (PM_{10}) and Nitrogen dioxide (NO_2), which may not meet the Air Quality standards, adopted by the Government. It is therefore necessary to carry out a stage 2 review and assessment. This will include the collation of data with regard to traffic emissions and further monitoring of particulates (PM_{10}) and Nitrogen dioxide. The current air quality monitoring carried out as part of Wrexham County Borough Council's Air Quality Strategy will continue and will be expanded in those areas where further monitoring is required. The methodology will be described within the scope of the second stage review and assessment.

Based on the recommendations of the first round of review and assessment Wrexham County Borough Council proceeded to the **second stage** of review and assessment, which presented the following conclusion:

The Stage 2 assessment has indicated that background air quality will improve up to 2005 throughout the County Borough. The review and assessment process has demonstrated that the predicted emissions from traffic growth have a limited impact on air quality within Wrexham over the next three years. The predictions were carried out to determine a worst case situation. The exceedence of the PM_{10} and the NO_2 objective from road sources is unlikely at any relevant location. This situation will continue to be reviewed annually as part of the air quality strategy and in the event of any proposed major new development. However, it is recognised that future increased traffic growth may challenge air quality in Wales and the rest of the UK and therefore this situation will need ongoing review. The local sources of pollutants for PM_{10} , and SO_2 which are considered to require a Stage 3 assessment are not expected to give rise to an exceedence of the air quality objective by 2004 / 2005.

The stage two review and assessment commented that there was insufficient monitoring data to be confident that the Air Quality Objectives would not be breached for PM_{10} and Sulphur Dioxide (SO_2). Hence Wrexham County Borough Council proceeded to the **third stage** of Review and assessment, which made the following conclusion:

The Stage 3 Assessment has indicated elevated particulate emissions from local domestic coal burning in the village of Llay. The results of the investigation indicate that the air quality standard and objective for particulate emissions in Llay may be exceeded.

The Public Protection Department of Wrexham County Borough Council will recommend the declaration of an Air Quality Management Area for Llay. This will include the production of a Stage 4 Report and the implementation of an Air Quality Action Plan during 2002.

An Air Quality Action Plan was implemented in 2003, which introduced a gas supply into the village of Llay. This had the effect of lowering the PM_{10} levels in the village and bringing them within the national guideline levels. This removed the need to declare an Air Quality Management Area in Llay.

The last Air Quality report prepared by Wrexham County Borough Council was the **Updating and Screening Assessment** (USA) and addendum. This report was completed in 2004 and concluded:

Results of the screening assessment have shown that no detailed assessment is required with respect to emissions arising from all sources assessed - predictions of air quality in relevant future years indicate that the current air quality objectives will be met at all receptors in Wrexham County Borough.

The USA also stated that:

WCBC will continue with its monitoring programme to confirm the findings of this report. Further work will be undertaken with respect to the performance of diffusion tubes through the use of triplicate tubes at the continuous roadside-monitoring site.

Monitoring Results

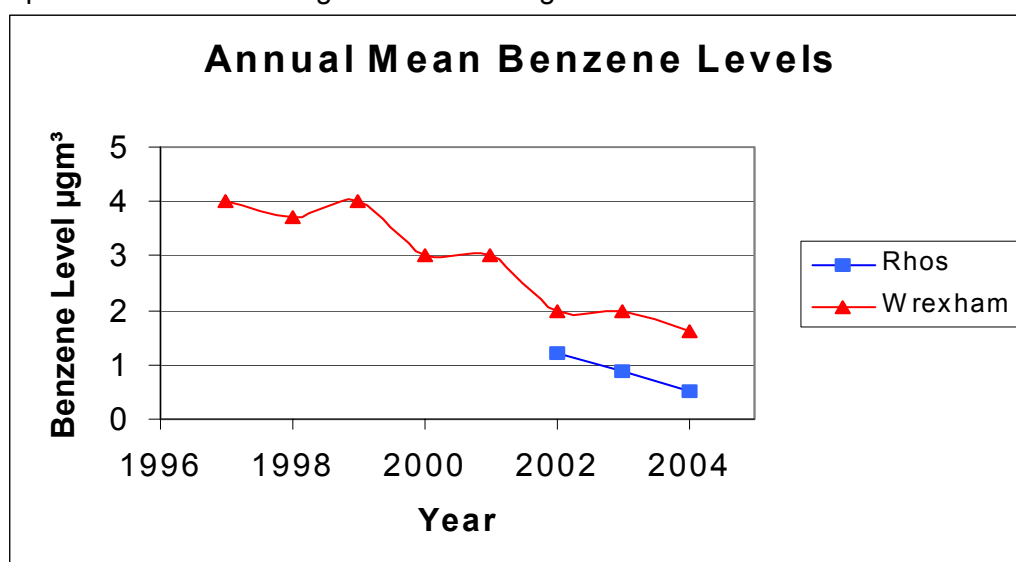
(i) Benzene

There is currently no national network Benzene monitoring being undertaken in North Wales (source www.welshairquality.co.uk).

Benzene is monitored for with diffusion tubes at two locations in the County Borough:
Llwyneinion Road in Rhosllanerchrugog (Rhos)
Grosvenor Road in Wrexham town

	Benzene Annual Mean Concentration μgm^3							
Location	1997	1998	1999	2000	2001	2002	2003	2004
Rhos	-	-	-	-	-	1.2	0.9	0.5
Wrexham	4.0	3.7	4.0	3.0	3.0	2.0	2.0	1.6

A plot of the above data gives the following trends.



The Benzene concentrations recorded at Grosvenor Road are showing a downward trend. This trend is mirrored at the monitoring location at Llwyneinion Road though, as less than five years of data exists for this site, definitive trends cannot be stated.

Using the method outlined in LAQM.TG(03) the following projections to the objective year can be made for mean annual Benzene levels at the two monitoring locations:

	Projected annual mean Benzene Concentration μgm^3					
Location	2005	2006	2007	2008	2009	2010
Rhos	0.4	0.4	0.4	0.3	0.3	0.3
Wrexham	1.2	1.2	1.1	1.1	1.0	1.0

This demonstrates that the recorded levels of Benzene and the projected levels will be within the standards set by the Air Quality (Wales) Regulations 2000 and Amendment (Wales) Regulations 2002.

(ii) 1,3-Butadiene

There is currently no national network for 1,3-Butadiene monitoring in North Wales (source www.welshairquality.co.uk).

Wrexham County Borough Council does not monitor for 1,3-Butadiene as no significant sources exist within the County Borough.

(iii) Carbon Monoxide

Wrexham County Borough Council is part of the Automatic Urban and Rural Network (AURN) for Air Quality. With Carbon Monoxide (CO) being one of the pollutants monitored at Wrexham. No other automatic network site monitors for Carbon Monoxide in North Wales (source www.welshairquality.co.uk).

Monitoring has shown that over the 2002, 2003 & 2004 calendar periods no exceedences of CO were recorded. The average annual readings since the start of monitoring are:

Year	% Data Capture	Annual mean CO Level mgm ³
2002 ¹	98.1	0.6
2003	98.7	0.6
2004 ²	98.9	0.4

1 – Monitoring did not start in 2002 until March 6th. Hence the 2002 data quoted above is for this point on (i.e. almost 10 months)

2 – The last quarter's data for 2004 has not yet been ratified (as of March 2005)

(iv) Lead

There is currently no automatic Lead monitoring being undertaken in North Wales (source www.welshairquality.co.uk).

Wrexham County Borough Council does not monitor for Lead as no significant sources exist within the County Borough.

(v) Nitrogen Dioxide

Wrexham County Borough Council is part of the Automatic Urban and Rural Network (AURN) for Air Quality. With Nitrogen Dioxide (NO₂) being one of the pollutants monitored for at Wrexham.

Monitoring has shown that over the 2002, 2003 & 2004 calendar periods no exceedences of the NO₂ objective were recorded. The average annual readings since the start of monitoring are:

Year	% Data Capture	Annual mean NO ₂ level µgm ³	Number of exceedences of the 1 hour mean
2002 ¹	94.4	24.0	0
2003	97.6	25.4	0
2004 ²	94.7	20.3	0

1 – Monitoring did not start in 2002 until March 6th. Hence the 2002 data quoted is for this point on (i.e. almost 10 months).

2 – The last quarter's data for 2004 has not yet been ratified (as of March 2005)

Using the method outlined in LAQM.TG(03) the following projections for future years can be made for the annual mean Nitrogen Dioxide levels at the AURN site:

Location	Projected annual mean NO ₂ Concentration µgm ³					
	2005	2006	2007	2008	2009	2010
AURN	18.1	17.5	16.9	16.2	15.5	14.9

Wrexham also monitors for NO₂ with diffusion tubes at sixteen locations throughout the County Borough (in 2004).

As well as this, a triplicate co-location study with diffusion tubes was carried out at the Victoria road AURN station in 2004. The co-location study has shown that a Bias Adjustment Factor (BAF) of 0.871 should be applied to the 2004 diffusion tubes results (see appendix.3). No such study was undertaken in 2003.

Location	Measured annual mean concentration for 2003 (µgm ³)	Measured annual mean concentration for 2004 (µgm ³)	Corrected annual mean concentration for 2004 (µgm ³)
Grosvenor Road, Wrexham	25.1	35.1	31
Crown Buildings, Chester Street, Wrexham	20.0	22.0	19
Redwither, Wrexham Industrial Estate	14.0	13.9	12
Plas Madoc, Cefn Mawr	14.2	13.0	11
Ceiriog School, Chirk	20.1	17.9	16
Flare Compound, Ruabon	23.3	-	-
Gardden Industrial Estate, Ruabon	19.8	-	-
Gardden View, Ruabon	15.6	17.5	15
St Michaels Close, Ruabon	16.0	-	-
Hugmore Lane, Wrexham Industrial Estate	21.0	21.1	18
Old Farm Road, Rhostyllen	22.4	19.0	17
Mold Road, Wrexham	21.2	26.3	23
Chester Road, Wrexham	23.3	24.8	22
Holt Road, Wrexham	21.3	26.6	23
Holyhead Road, Chirk	19.3	20.7	18
Gresford Roundabout, Wrexham	-	31.6	28
B&Q Roundabout, Wrexham	-	39.5	34
Rhostyllen Roundabout, Wrexham (A483)	-	28.0	28
Bus Station, Wrexham ¹	-	-	-

1 - Monitoring did not start at the Bus Station until November 2004. Therefore the results will be reported in the 2006 Updating and Screening Assessment.

The above table indicates three new monitoring sites, where monitoring began in early 2004 and therefore their data has been included:

- Gresford Roundabout
- B&Q Roundabout
- Rhostyllen Roundabout

The levels of NO₂ recorded at the Grosvenor Road and B&Q roundabout sites are approaching the limit values specified in the Air Quality (Wales) Regulations 2000 and Amendment (Wales) Regulations 2002:

Grosvenor Road is a busy thoroughfare with business on either side. There are no residences, hence there are not considered to be any sensitive receptors as defined by LAQM.PG(03). Monitoring was conducted at this site (along with Benzene – see (i)) as it is one of the busier rush hour roads and often congested at these times, thus providing useful information with relevance to traffic emissions.

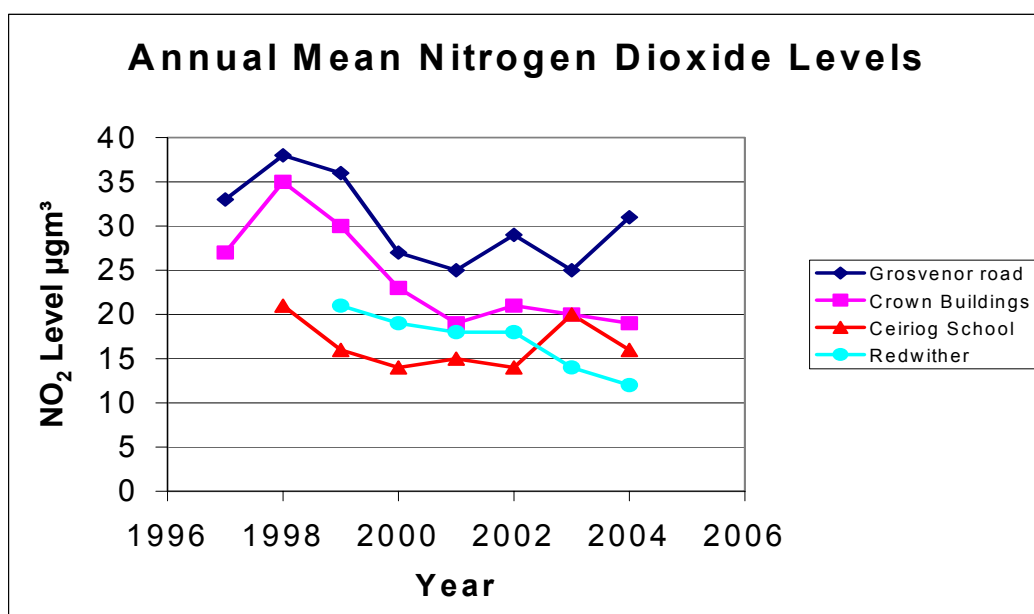
The B&Q roundabout is a busy junction of the A483. The nearest residential property is 160m away and hence there are no sensitive receptors as defined by LAQM.PG(03).

The results indicate that there will be no exceedences of the Air Quality (Wales) Regulations 2000 and Amendment (Wales) Regulations 2002 for NO₂ at any sensitive locations.

Of the above nineteen monitoring sites, only four have been running for five years or more:

Site	Start Date
Grosvenor Road	May 1996
Crown Buildings	May 1996
Ceiriog School	June 1997
Redwither	Nov 1998

The following chart shows the trend at these four monitoring sites, starting with the first full year of available data (note the 2004 results have been bias corrected):

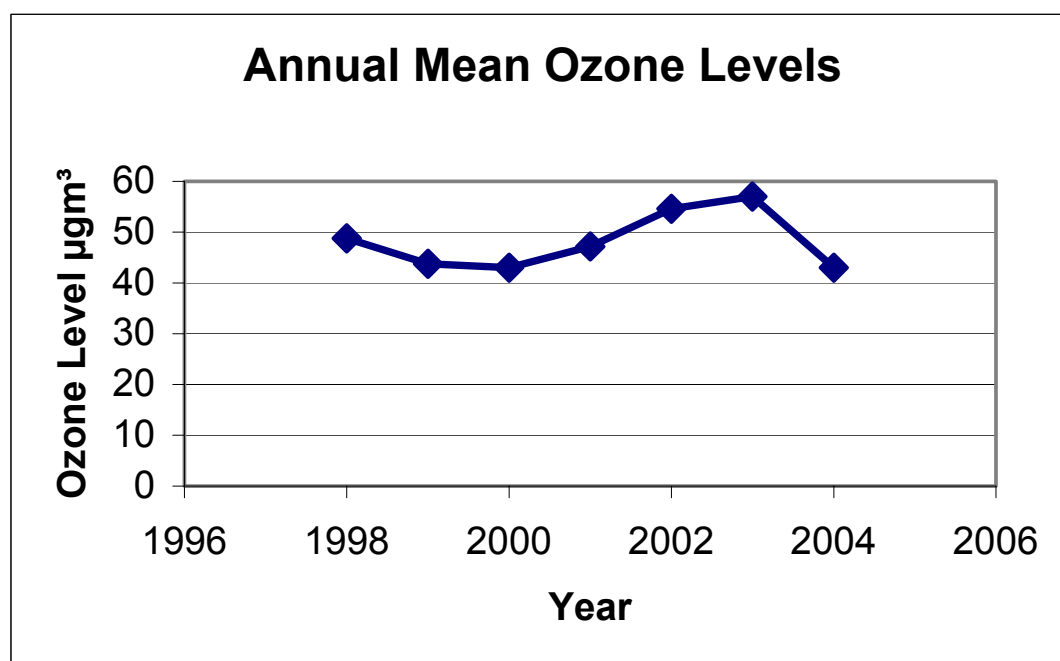


The overall trend for the four monitoring sites has been downward, though Grosvenor Road has shown an increase from 2003 to 2004. However, as has been previously commented Grosvenor Road contains no sensitive receptors.

(vi) Ozone

Even though Ozone (O₃) is not included in the Air Quality (Wales) Regulations 2000 and Amendment (Wales) Regulations 2002. Wrexham County Borough Council has undertaken monitoring for it at one location in the County Borough – Chirk. The monitoring has been carried out using a diffusion tube, which can't be directly related to the guideline values as stated in the Air Quality (Wales) Regulations 2000 and Amendment (Wales) Regulations 2002. However, it is able to provide general trend information:

Location	Measured annual mean concentration for 2003 (µgm ³)	Measured annual mean concentration for 2004 (µgm ³)
Chirk	55	43



The above chart does show that the Ozone levels have remained reasonably consistent over the monitoring at period 50 ± 10 µgm³.

(vii) Particulate Matter

Wrexham County Borough Council is part of the Automatic Urban and Rural Network (AURN) for Air Quality, with Particulate Matter (PM₁₀) being one of the pollutants monitored for at Wrexham.

Monitoring has shown that over the 2002, 2003 & 2004 calendar periods no exceedences of PM₁₀ were recorded. The average annual readings since the start of monitoring are (the monitoring has been conducted gravimetrically and therefore has not required correction):

Year	% Data Capture	Annual mean PM ₁₀ Level µgm ³	Number of exceedences of 50µgm ²
2002 ¹	93	25	21
2003	87	36	38
2004 ²	92	20	9

1 – Monitoring did not start in 2002 until March 1st Hence the 2002 data quoted is for this point on (i.e. 10 months)

2 – The last quarter's data for 2004 has not yet been published (as of March 2005) hence the data shown is for the first nine months of the year.

Even though there are no exceedences of the Air Quality (Wales) Regulations 2000 and Amendment (Wales) Regulations 2002 shown in the above table, it is worthy to comment on the 2003 results,

In the UK, during the first three months of 2003, there were more exceedences of the AQS (Air Quality Standard) PM₁₀ standard than in the whole of 2002.

At the time of writing, three UK Automatic Network reports have identified the main pollution episodes in 2003, these are;

- 1) *a PM₁₀ episode from 17th February to the 2rd March*
- 2) *a PM₁₀ episode from the 15th to 30th March, a period of low and then a PM₁₀ and ozone episode from 12 to 30 April.*

(source Air Quality Wales, The bulletin of the Welsh Air Quality Forum – issue 5, September 2003)

Of the thirty-eight exceedences recorded for 2003, twenty-eight occurred during these PM₁₀ episodes.

Additionally to the AURN station Wrexham County Borough Council has monitored for PM₁₀, again gravimetrically, at the following locations:

Monitoring Site	Start Date	Finish Date
Chirk – Bron-Y-Waun	26.11.02	15.05.03
Chirk – Chirk Court	16.05.03	Ongoing
Llay – Housing Estate Office	06.11.02	Ongoing
Llay – Allotments	26.11.02	08.10.03

In Chirk, the Bron-Y-Waun location was changed to Chirk Court in order to assess the effect of domestic coal burning on the PM₁₀ levels in the village. This was discussed in the Updating and Screening Assessment (USA) Addendum. The USA Addendum discussed these results up to the end of April 2004. However, the results for the entirety of 2004 are presented below:

Year	% Data Capture	Annual mean PM ₁₀ Level µgm ³	Number of exceedences of 50µgm ²
2004	91	22	9

Which demonstrates that Chirk did not experience any exceedence of the Air Quality (Wales) Regulations 2000 and Amendment (Wales) Regulations 2002 for PM₁₀ during 2004.

Additional modelling for pollutants is currently being undertaken for the village of Chirk and the results will be reported in the 2005 Update and Screening Assessment.

Monitoring at Llay was also conducted as part of an evaluation into domestic coal burning in the village. As mentioned in the Stage three report (see page 4):

The Public Protection Department of Wrexham County Borough Council will recommend the declaration of an Air Quality Management Area for Llay. This will include the production of a Stage 4 Report and the implementation of an Air Quality Action Plan during 2002.

An action plan was devised and a domestic gas supply was introduced into the village. Which led to a reduction in the PM₁₀ levels and no longer required that an Air Quality Management Area be declared.

Monitoring was conducted simultaneously at two locations in Llay so as to better understand the impact that coal burning was having. The housing estate office is located in what was the coal burning region of Llay whereas the allotments monitoring site was located within a non-coal burning area, to the west of the main coal burning area. However, as previously stated, there were three high PM₁₀ episodes in 2003.

Llay Allotments

Year	% Data Capture	Annual mean PM ₁₀ Level µgm ³	Number of exceedences of 50µgm ²
2003 ¹	98	24	34

1 – Monitoring concluded on the 08.10.03 at the Llay Allotments, hence the above data is shown until this point.

Of the thirty-four exceedences quoted for 2003, twenty-nine fell within the PM₁₀ episodes.

Llay Estate Office

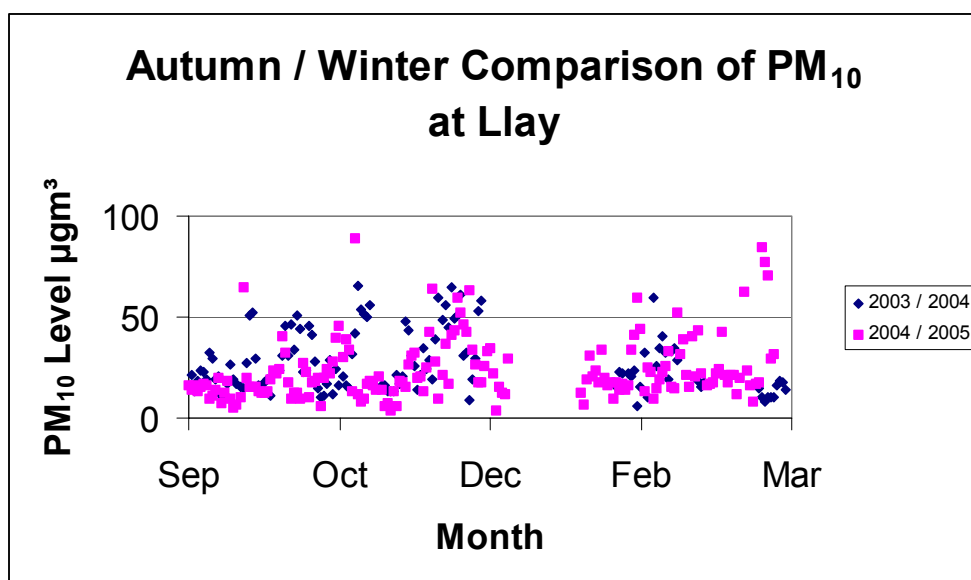
Year	% Data Capture	Annual mean PM ₁₀ Level µgm ³	Number of exceedences of 50µgm ²
2003	84	32	57
2004	78	21	11

Of the fifty-seven exceedences recorded at the Llay Estate Office in 2003, twenty-seven fell within the PM₁₀ episodes.

The difference in number of exceedence days that can be attributed to the PM₁₀ episodes between the two sites is due to their capture rate. The Llay allotment's monitor captured nearly every day in each of the three PM₁₀ episodes, whereas the Llay Estate Office monitor was suffering a malfunction during the third PM₁₀ episode (12th to 30th April).

The Llay estate office table above does show a decrease in the number of exceedences between the 2003 to 2004 monitoring periods, even if the PM₁₀ episodes are discounted from the 2003 exceedence days.

Introduction of a domestic gas supply into Llay was completed in July 2004. Since it is the autumn / winter months that are the critical comparison months to determine the success of the scheme, and though it falls outside of the scope of this report, a comparison of the 2003/2004 and 2004/2005 autumn / winter months is shown below.



Tabulating the above chart gives the following results:

Month	% Data Capture		Mean PM ₁₀ Level µgm ³		Number of exceedences of 50µgm ²	
	³ / ₄	04/05	³ / ₄	04/05	03/04	04/05
September	94	100	20	18	0	1
October	94	100	28	20	3	0
November	90	100	30	21	5	1
December	55	84	43	31	7	4
January	3	42	15	19	0	0
February	79	97	25	26	1	2
March	35	74	16	30	0	4
Total	64	85	27	24	16	12

The above chart and table also confirm the improvement of the PM₁₀ levels in Llay as a result of the introduction of a domestic gas supply. These figures may even be understating this level of improvement, as there were some low capture rates in the 2003 / 2004 period, especially for three of the monitoring months (December, January & March) as compared to one low capture month for the 2004 / 2005 period (January).

(viii) Sulphur Dioxide

Wrexham County Borough Council is part of the Automatic Urban and Rural Network (AURN) for Air Quality. With Sulphur Dioxide (SO₂) being one of the pollutants monitored for at Wrexham.

Monitoring has shown that over the 2002, 2003 & 2004 calendar periods no exceedences of the SO₂ objectives were recorded. The relevant readings since the start of monitoring are:

Year	% Data Capture	No of Exceedences of the 15 minute mean	No of Exceedences of the 1 hour mean	No of Exceedences of the 24 hour mean	Annual mean
2002 ¹	83	0	0	0	5
2003	97	0	0	0	5
2004 ²	87	0	0	0	3

1 – Monitoring did not start in 2002 until March 6th. Hence the 2002 data quoted is for this point on (i.e. almost 10 months).

2 – The last quarter's data for 2004 has not yet been ratified (as of March 2005).

The mean value is shown for comparison to the diffusion tube monitoring data, which is tabulated below. As there are no criteria within the Air Quality (Wales) Regulations 2000 and Amendment (Wales) Regulations 2002 for annual Sulphur Dioxide levels.

In addition to the AURN monitoring, Wrexham County Borough Council monitors for Sulphur Dioxide at four locations within the County Borough using diffusion tubes:

Llay Estate Office - Llay
 Blast Road – Brymbo
 Maes-Y-Waun – Chirk
 Victoria Road - Wrexham

Location	Sulphur Dioxide Annual Mean Concentration µgm ³				
	2000	2001	2002	2003	2004
Llay	21.6	12	17	11.6	9.1
Brymbo	5.4	3	6	3.8	3.8
Chirk	6	9	5.9	5.3	6.0
Wrexham	-	-	-	-	4.7

As can be seen both Llay and Brymbo have shown a general downward trend. Chirk has remained, reasonably consistent over the monitoring period.

New Local Developments

(i) New Industrial Developments.

For 2003: None identified

For 2004: None identified

(ii) New Residential & Retail

a. With a significant risk of impacting on air quality (planning approval containing air quality related conditions):

For 2003: None identified

For 2004: None identified

b. With a lower risk of impacting on air quality (planning approval not containing air quality related):

For 2003

Site Name	Grid Reference	Development Type And Scale	Planning Status and Reference Number	Completed	Air Quality Implications
ACREFAIR Llangollen Road	328131 343308	Housing 13 Units	Permission Granted P/2002/0649	2003	Traffic
BRYMBO Mount Hill	329641 353759	Housing 25 Units	Permission Granted CB003197	2003	Traffic
MOSS Bryn Road	330427 353762	Housing 9 Units	Permission Granted P/2002/0912	2003	Traffic
RHOS School Street	328891 346610	Housing 15 Units	Permission Granted P/2000/0584	2003	Traffic
RUABON High School, Pont Adam	329783 344138	Housing 19 Units	Permission Granted P/2002/0690	2003	Traffic
SOUTHSEA Mountain View	330855 351538	Housing 30 Units	Permission Granted P/2002/0167	2003	Traffic

For 2004

Site Name	Grid Reference	Development Type And Scale	Planning Status and Reference Number	Completed	Air Quality Implications
RUABON High School, Pont Adam	329783 344138	Housing 8 Units	Permission Granted P/2002/0786	2004	Traffic
RUABON Wynnstay Hall	330973 342619	Housing 8 Units	Permission Granted P/2000/0813	2004	Traffic
SOUTHSEA Mountain View	330855 351538	Housing 42 Units	Permission Granted P/2002/0167	2004	Traffic
SUMMERHILL Bottom Road	331147 354108	Housing 22 Units	Permission Granted P/2003/0195	2004	Traffic

WREXHAM Salop Road	333649 349843	Retail 1 Unit (1800 m ²)	Permission Granted P/2003/0989	2004	Traffic
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Planning Applications

Site Name	Grid Reference	Development Type And Scale	Planning Status or Application Number	Current Position
BRYMBO Blast Road	329454 353643	Learning, Information & Resource Centre	P/2005/0088	Not Determined
BRYMBO Former Steelworks	329619 353430	Housing 532 Units & Employment	CB00016 and subsequent variations	Site under Development
WREXHAM Bryn Lane	339268 350166	Materials Recovery and Energy Centre	P/2003/1595	Not Determined
WREXHAM Central Road Brewery	332939 350478	Retail 5 Units (2322 m ²)	P/2002/1145 P/2004/0660	Under Construction

The two planning applications listed for Brymbo are part of the redevelopment of the former steel works, which is currently undergoing reclamation works. More information on this site is given below, under Quarries.

(iii) New Land fills / Quarries

Landfill

2003: None Identified
2004: None Identified

Quarries

2003: None Identified
2004: Open-cast coal operations begin at Brymbo Steelworks as part of the reclamation.

The redevelopment of the former Brymbo steelworks site is a large scale redevelopment with an end aim of converting the site into a mixed use residential / commercial area. As part of the redevelopment, Brymbo Developments Limited (BDL) have been granted a permit to conduct open cast coal mining.

BDL has contracted an environmental consultants company to perform on site air quality monitoring, which currently includes:

- PM₁₀
- Total Suspended Particles (TSP)
- Airborne Metals (Using the Environment Agencies - Environmental Actions Levels (EAL) as guidelines)

In addition to this Wrexham County Borough Council maintains and operates two Osiris dust monitors in the vicinity of, but off, the development site and monitors for PM₁₀ and TSP. These monitors have been in operation since 2002 as part of the County Councils monitoring program.

These sites are located at:

Site Name	Grid Ref.	Description
Pentre Broughton	SJ3053	Located at the back of a residential property overlooking site
Tanyfron	SJ2952	Located on the edge of a residential area

The monitoring results are shown below (note: as the Osiris monitors are light scattering devices, a scaling factor of 1.3, as per national guidelines, has been applied to obtain a gravimetric equivalent):

Pentre Broughton

Year	% Data Capture	Annual mean PM ₁₀ Level µgm ³	Number of exceedences of 50µgm ²
2003	90	17	16
2004	58	23	5

Of the sixteen exceedences recorded at Pentre Broughton fifteen fall within the PM₁₀ episodes of 2003 (section 3 vii, page 11).

Tanyfron

Year	% Data Capture	Annual mean PM ₁₀ Level µgm ³	Number of exceedences of 50µgm ²
2003	97	29	37
2004	91	19	6

Of the thirty seven exceedences recorded at Tanyfron in 2003 twenty eight occurred during the PM₁₀ episodes.

(iv) New Roads

Wrexham County Borough Council is currently considering the implications of improving access to the Wrexham Industrial Estate from the existing A5156 (Llan-Y-Pwll link road). Several routes have been proposed and an Environmental Assessment Report has been prepared which considers each of these proposals. The report considers a range of environmental impacts, which includes air quality.

The report concludes that air quality will be improved at a number of properties due to reduced traffic flows on existing roads. Also it states that air quality will not be made worse at any sensitive receptors.

This scheme is still in the preplanning application stage and further assessments / evaluation will be undertaken once a planning application has been submitted.

Additional Information

Formaldehyde Monitoring

In 2004 Wrexham County Borough Council carried out two rounds of passive, ambient formaldehyde monitoring in the village of Chirk. Radiello tubes were chosen for the survey, based upon the recommendations of Glasgow Scientific Services who are both, UKAS and WASP (The Workplace Analysis Scheme for Proficiency run by the HSE laboratory) for testing formaldehyde by this method.

In all cases with one exception, the ambient levels of formaldehyde have been within the expected background levels (1 to 20 $\mu\text{g}/\text{m}^3$) as published by the World Health Organisation (WHO). The UK currently has no such guidelines.

On one occasion, a value of 41 $\mu\text{g}/\text{m}^3$ was recorded over a 24-hour period. The WHO have quoted an observed effect level of 100 $\mu\text{g}/\text{m}^3$ and therefore set a guide level of 100 $\mu\text{g}/\text{m}^3$ for a thirty minute exposure period. The disadvantage with the passive method is highlighted in this case where no peak value could be determined, only a time weighted average for the 24 hour exposure time can be recorded. Hence it can not be conclusively stated whether the formaldehyde levels were above this value at any point during the 24 hour exposure period. As a result of this, Wrexham County Borough Council has purchased an active monitoring system, which will allow for thirty-minute exposure measuring.

Air Quality Monitoring Station

Wrexham County Borough Council is purchasing an air quality monitoring station in 2005. This will be situated in the vicinity of the Wrexham Industrial Estate and will monitor for the following pollutants as defined by the Air Quality Objectives:

- Nitrogen Dioxide
- Sulphur Dioxide
- Particulate Matter (PM_{10})

Meteorological equipment will also be incorporated, to allow a better understanding and modelling of any results supplied by the station.

SUMMARY OF KEY POINTS AND FUTURE ACTIONS.

This progress report concludes that:

1. The findings of the Updating and Screening Assessment continue to remain valid
2. That there has not been any change in local circumstances to indicate a possible exceedance of the air quality standards and objectives.
3. That potential changes in local circumstances will most likely relate to increases in traffic (e.g. as a result on increased housing development) at sensitive locations.
3. The introduction of a domestic gas supply into the coal-burning region of Llay has had the effect of reducing the PM₁₀ levels, and as a result has improved the Air Quality in the village.
4. The future recommendations as outlined in the USA continue to remain valid, namely:
 - a – WCBC will continue its monitoring program.
 - b – The co-location study into the Nitrogen Dioxide diffusion tubes located at the Victoria Road AURN station will continue

APPENDIX 1

Air Quality Standards

The following table shows the pollutants as classified by the Air Quality (Wales) Regulations 2000 and (Amendment) (Wales) Regulations for the purpose of Local Air Quality Management. These Air Quality Regulations have adopted into UK law the limit values required by EU Daughter Directives on Air Quality:

The permitted atmospheric levels have been determined by what is known about their effect on human and environmental health.

The objective expresses the level of pollutant that is permitted in the air over a given period of time. This level is often expressed as:

μgm^3 - micrograms per cubic meter, where one micogram is one millionth of a gram.

mgm^3 - milligrams per cubic meter, where one milligram is one thousandth of a gram.

The table also shows the date by which this level should be achieved.

Pollutant	Air Quality Objective Concentrations	Measured as	Target date
Benzene	16.25 μgm^3	Running Annual Mean	31.12.2004
	5.00 μgm^3	Annual Mean	31.12.2010
1,3-Butadiene	2.25 μgm^3	Running Annual Mean	31.12.2003
Carbon Monoxide	10.0 mgm^3	Maximum Daily Running 8 Hour Mean	31.12.2003
Lead	0.50 μgm^3	Annual Mean	31.12.2004
	0.25 μgm^3	Annual Mean	31.12.2008
Nitrogen Dioxide	200 μgm^3	1 Hour Mean Not to be exceeded more than 18 times per annum	31.12.2005
	40 μgm^3	Annual Mean	31.12.2005
Ozone (not included in regulations)	100 μgm^3	Running 8 Hour Mean Not to be exceeded more than 10 times a year	31.12.2005
Particulate Matter PM ₁₀	50 μgm^3	24 Hour Mean Not to be exceeded more than 35 times a year	31.12.2004
	40 μgm^3	Annual Mean	31.12.2004
Sulphur Dioxide	266 μgm^3	15 Minute Mean Not to be exceeded more than 35 times a year	31.12.2005
	350 μgm^3	1 Hour Mean Not to be exceeded more than 24 times a year	31.12.2004
	125 μgm^3	24 Hour Mean Not to be exceeded more than 3 times a year	31.12.2004

APPENDIX 2 (i)

Diffusion Tube Locations (table)

Nitrogen Dioxide

Location	OS Grid ref.	Site Classification	Notes
Grosvenor Road, Wrexham	SJ3350	Roadside	
Crown Buildings, Chester Street, Wrexham	SJ3350	Urban Background	
Redwither, Wrexham Industrial Estate	SJ3850	Industrial	
Plas Madoc, Cefn Mawr	SJ2843	Urban Background	
Ceiriog School, Chirk	SJ2938	Urban Background	
Flare Compound, Ruabon	SJ2944	Urban background	Monitoring discontinued Jan 2004
Gardden Industrial Estate, Ruabon	SJ3044	Industrial	Monitoring discontinued Jan 2004
Gardden View, Ruabon	SJ3044	Roadside	
St Michaels Close, Ruabon	SJ3044	Urban Background	Monitoring discontinued Jan 2004
Hugmore Lane, Wrexham Industrial Estate	SJ3751	Roadside	
Old Farm Road, Rhostyllen	SJ3148	Roadside	
Mold Road, Wrexham	SJ3251	Roadside	
Chester Road, Wrexham	SJ3352	Roadside	
Holt Road, Wrexham	SJ3450	Roadside	
Holyhead Road, Chirk	SJ2838	Roadside	
Gresford Roundabout, Wrexham	SJ3251	Roadside	
B&Q Roundabout Wrexham	SJ3048	Roadside	
Rhostyllen Roundabout Wrexham (A483)	SJ3048	Roadside	
Bus Station, Kings Street, Wrexham	SJ3350	Roadside	Monitoring started Nov, 2004

Sulphur Dioxide

Location	OS Grid ref.	Site Classification	Notes
Llay Housing Office	SJ3355	Suburban	
Blast Road, Brymbo	SJ2953	Urban Background	
Maes-Y-Waun, Chirk	SJ2938	Urban Background	

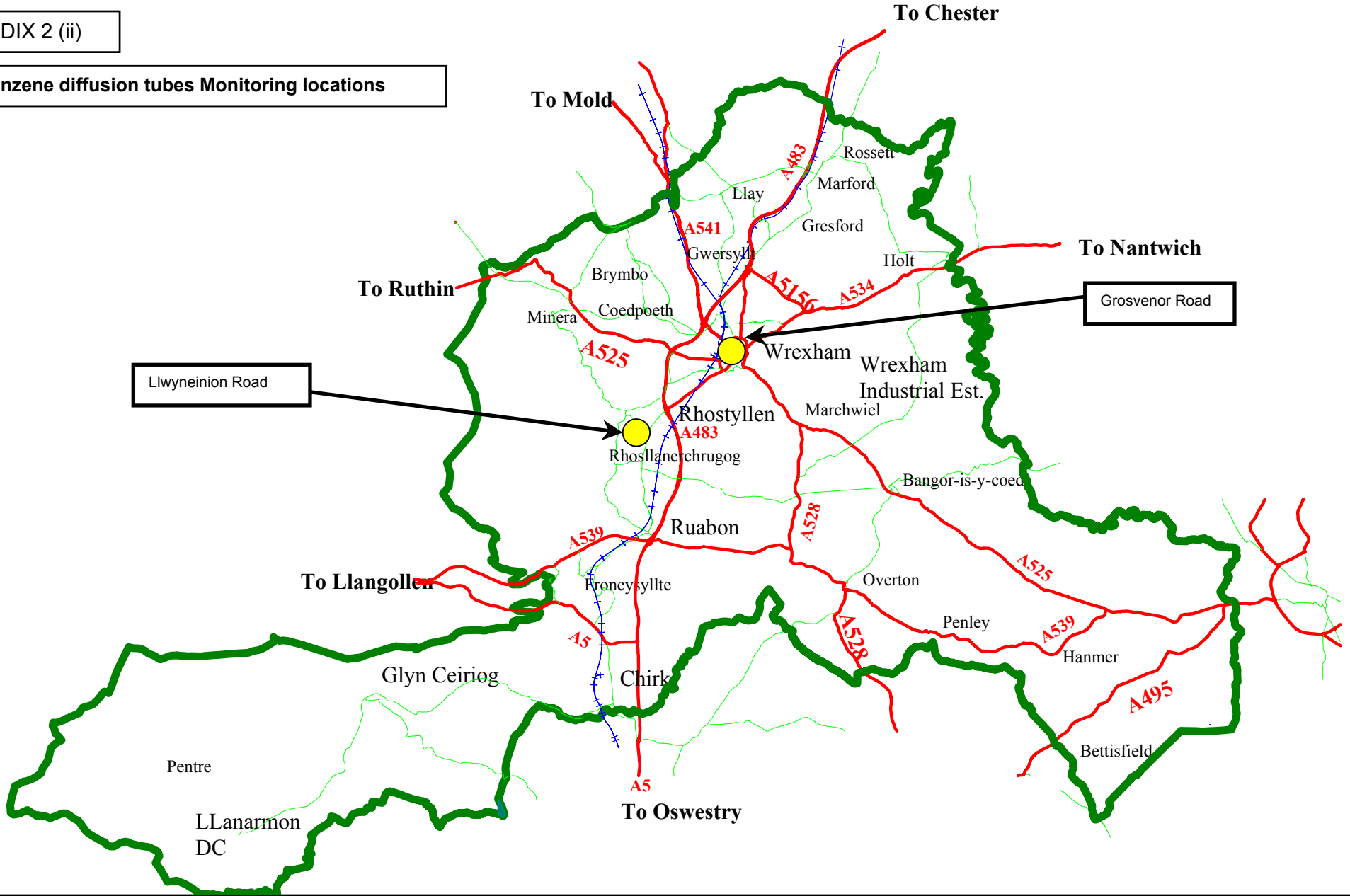
Benzene

Location	OS Grid ref.	Site Classification	Notes
Grosvenor Road, Wrexham	SJ3350	Roadside	
Llwyneinion Road, Rhosllanerchrugog	SJ2847	Other	Monitoring program near landfill site

Ozone

Location	OS Grid ref.	Site Classification	Notes
Maes-Y-Waun, Chirk	SJ2938	Urban Background	

Benzene diffusion tubes Monitoring locations

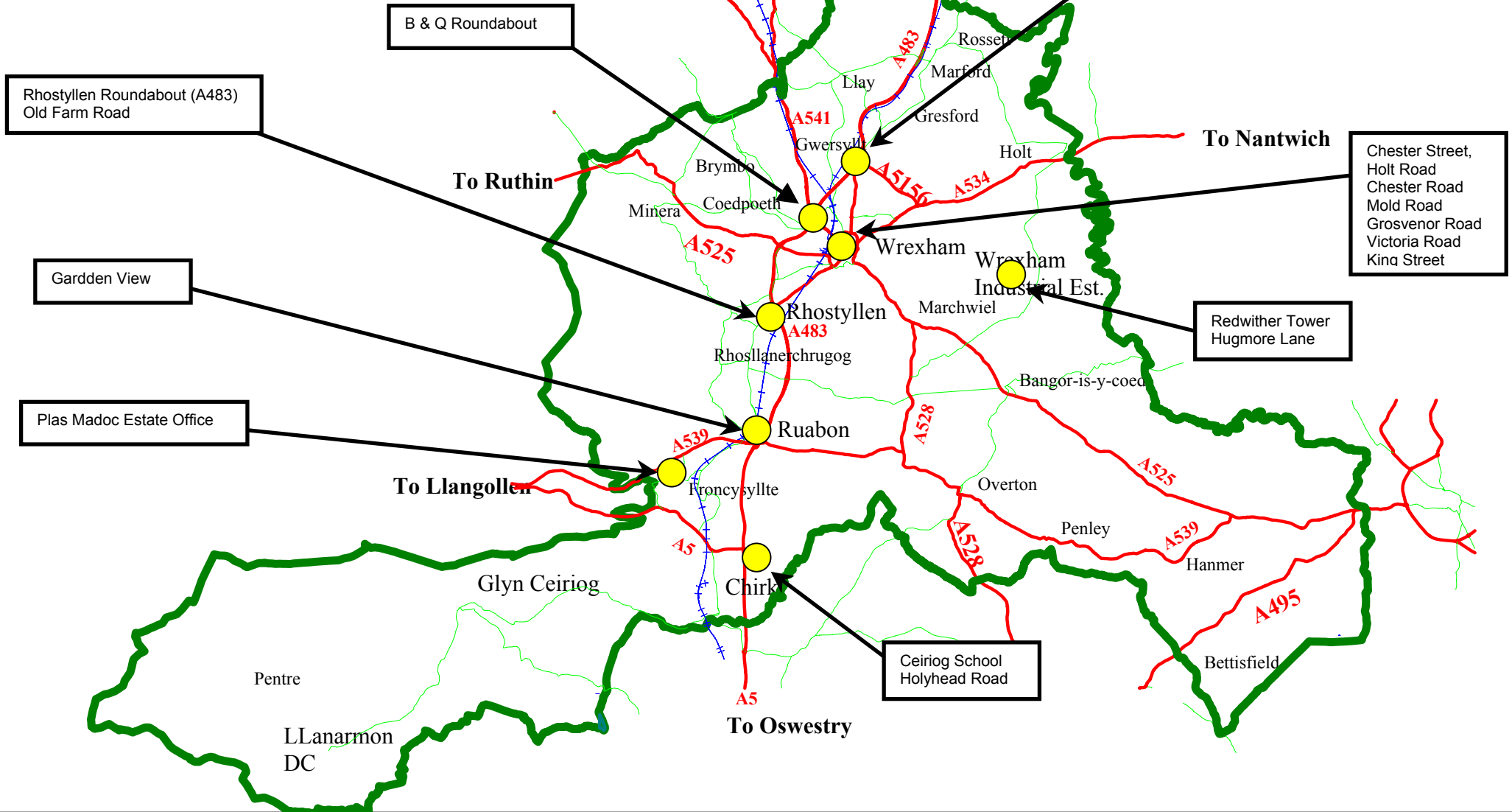


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APPENDIX 2 (ii)

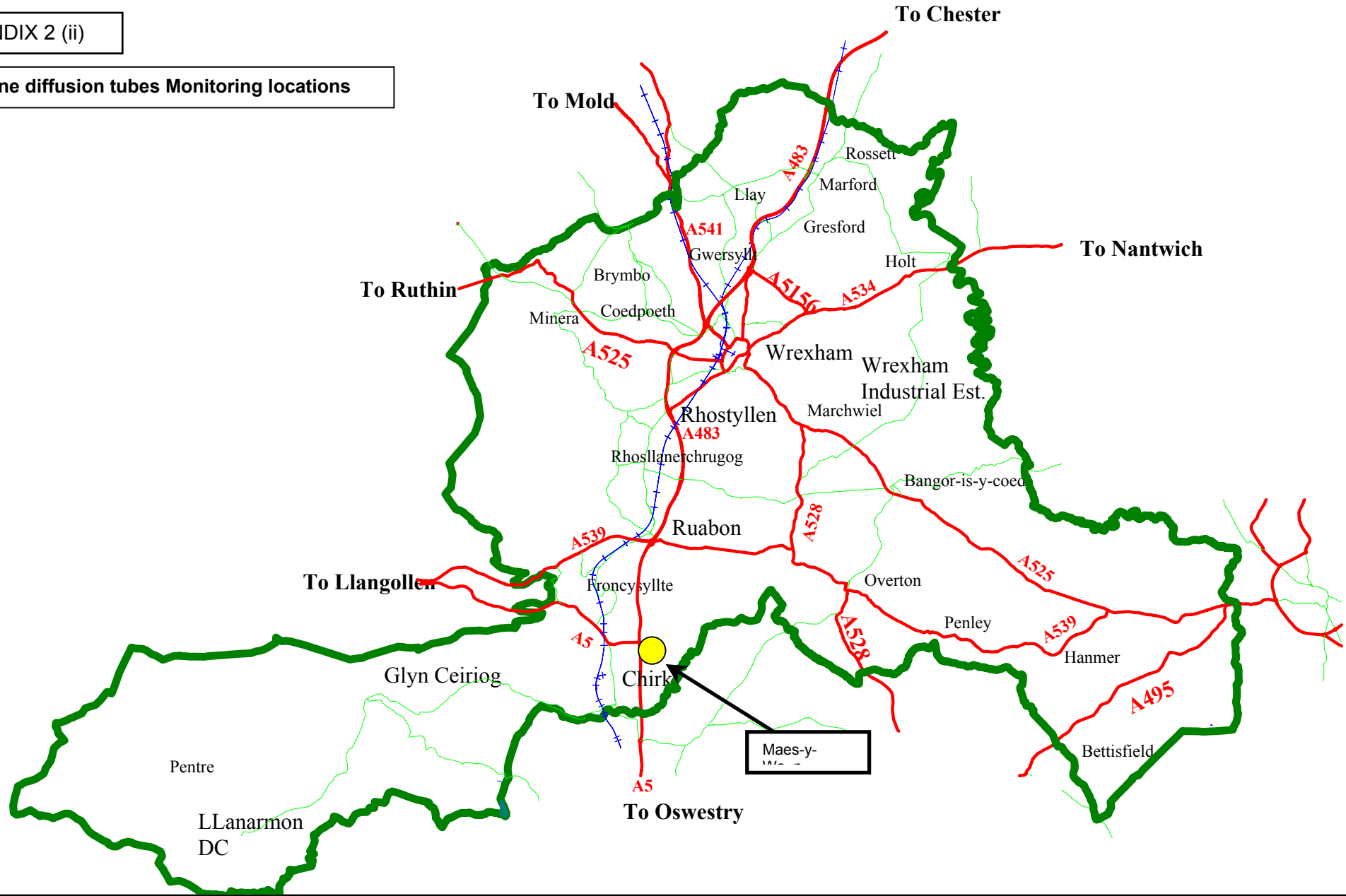
Nitrogen Dioxide diffusion tubes Monitoring locations



Wrexham County Borough

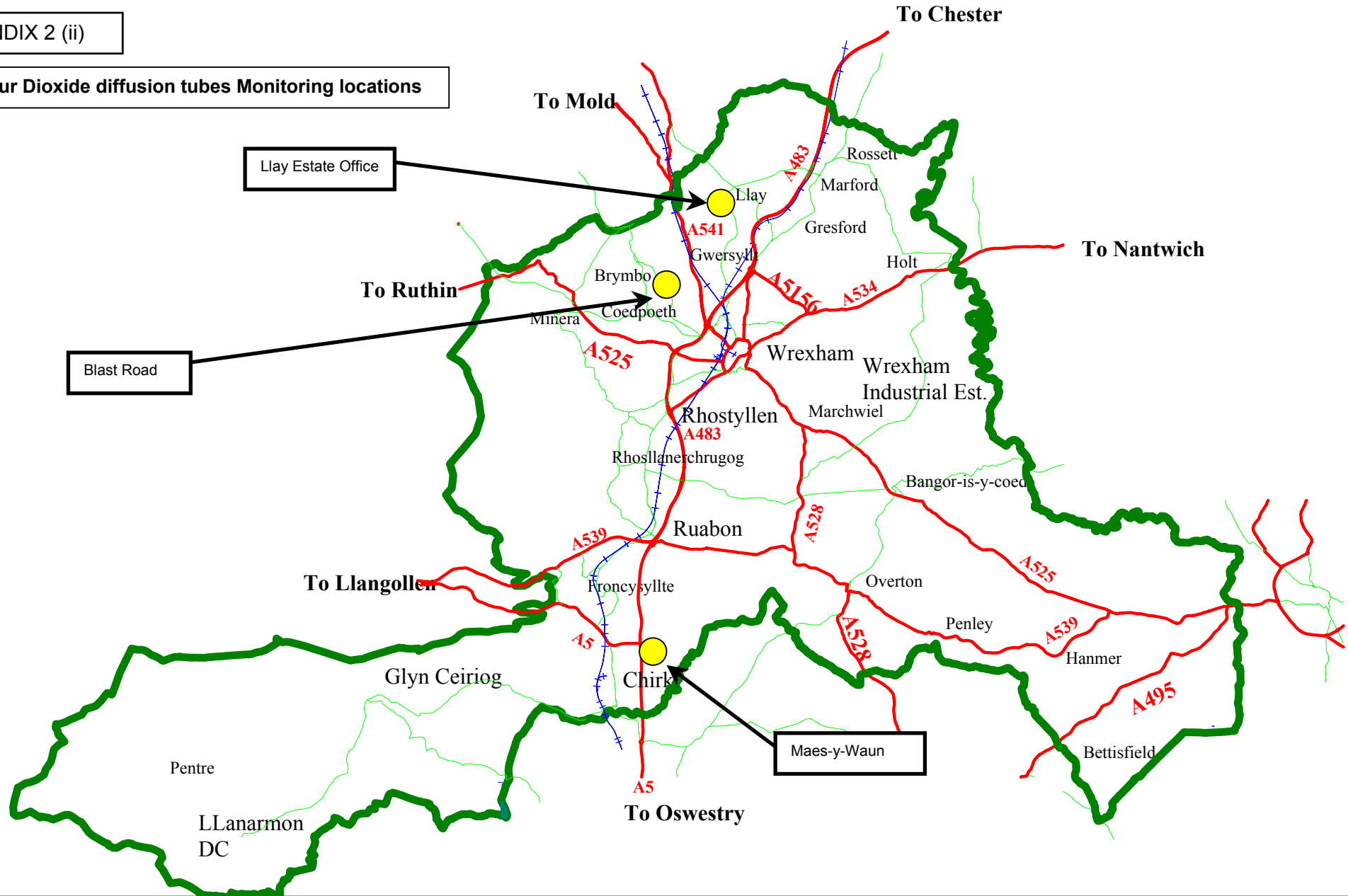
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Ozone diffusion tubes Monitoring locations



Wrexham County Borough

Sulphur Dioxide diffusion tubes Monitoring locations

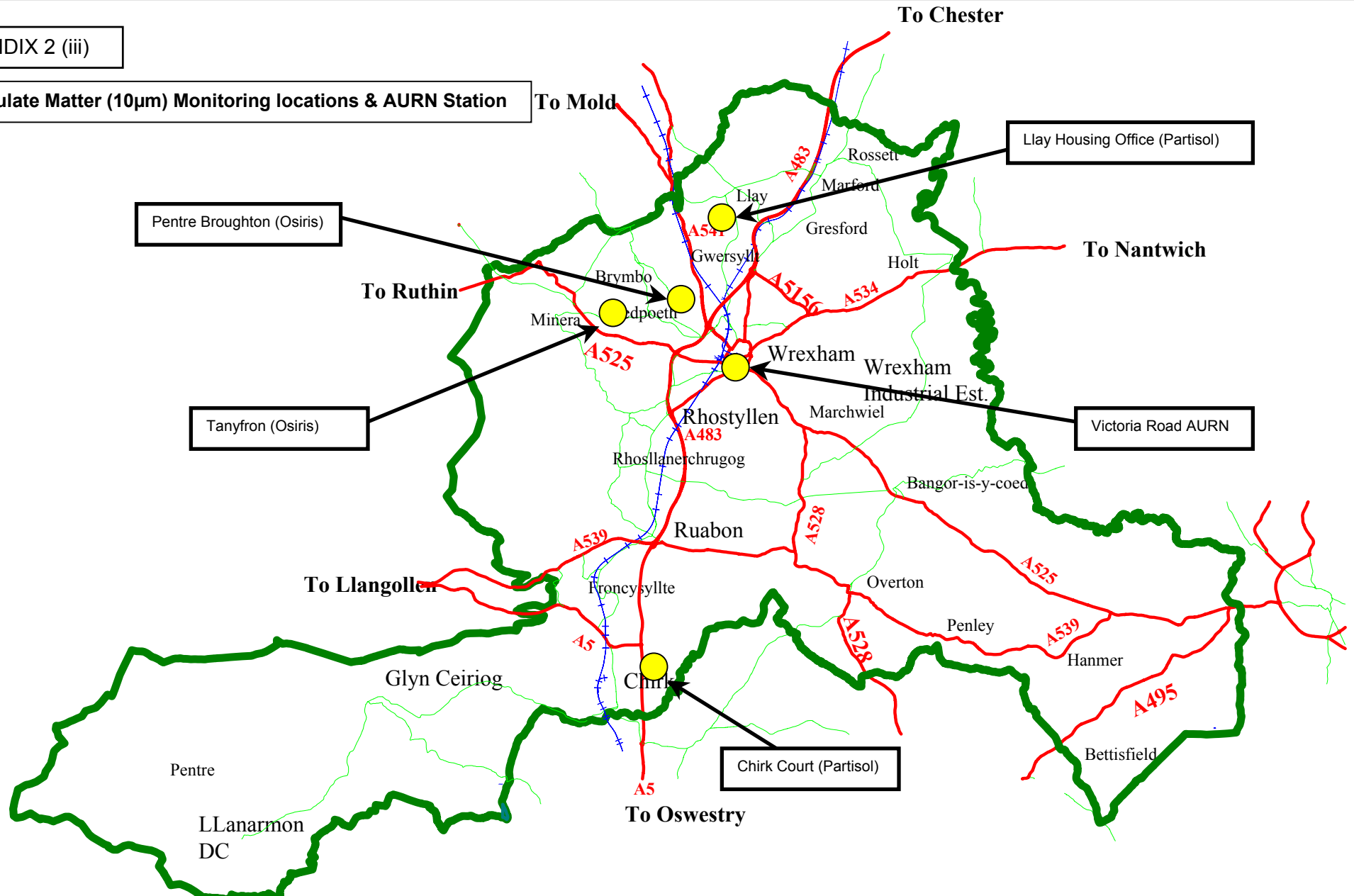


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APPENDIX 2 (iii)

Particulate Matter (10µm) Monitoring locations & AURN Station



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APPENDIX 3

Nitrogen Dioxide diffusion tube analysis and bias adjustment

Test laboratory:

Casella CRE Air
The Heath Technical & Business Park
Runcorn
Cheshire
WA7 4QX

Quality Control etc:

UKAS accredited and participation in the WASP scheme for both Nitrogen Dioxide and Benzene tubes.

Tube preparation method:

10% TEA in water

Bias Adjustment Factor

2004 Bias Adjustment Factor (BAF) used in this report = 0.871 is based on a 12 month monitoring period at the Victoria Road AURN station in Wrexham County Borough.