



2015 Air Quality Updating and Screening Assessment for *Gwynedd Council*

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

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Executive Summary

Gwynedd Council has carried out a review and assessment of air quality within its boundary which fulfils the requirements of the Local Air Quality Management process in Part IV of the Environment Act (1995) and the Air Quality (Wales) Regulations 2000 and the Air Quality (Amendment) (Wales) Regulations 2002.

This Updating and Screening Assessment (USA) begins the sixth round of the Review and Assessment process which began in 1999. This document includes the latest data from 2014 but also considers the years 2012 and 2013 since the last USA was submitted in 2012 and the previous rounds of Review and Assessment. Any changes that have occurred and how they would affect air quality since the last round will be investigated.

During 2014 Gwynedd Council has conducted monitoring for Nitrogen Dioxide at various roadside locations

The conclusion of our previous Updating and Screening Assessment did not identify the need to progress to a Detailed Assessment for any pollutant

Gwynedd Council only carried out Nitrogen Dioxide monitoring through the use of diffusion tubes during 2014. All monitoring locations recorded levels below the Annual Mean Objective of $40 \mu\text{g}/\text{m}^3$.

Monitoring location C2 which is a kerbside monitoring position adjacent to the 'Morrison's' roundabout on the A487 in Caernarfon has exceeded the $40 \mu\text{g}/\text{m}^3$ objective in the past. The last year this happened was 2012. Further investigation of this exceedance demonstrated that it did not pose an exposure risk to members of the public due to its location, and a prediction of exposure at the nearest locations of concern confirmed that the concentration fell well within the required objective. During 2013 and 14 location C2 did not show an exceedance of the annual mean.

It is Gwynedd Council's intention to continue with its NO_2 monitoring programme throughout 2015. We have reduced our number of monitoring locations from 31 during 2009 to 16 in 2010 and then down to 12 during 2011. The locations that have showed the highest concentrations of NO_2 in the past, specifically within the town of Caernarfon and city of Bangor remain, whereas we no longer monitor in the more rural locations that have shown low concentrations.

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1 Introduction

1.1 Description of Local Authority Area

The County of Gwynedd lies between the area from Abergwyngregyn in the north to Aberdyfi in the south, and from the Llyn Peninsula in the west to Glan yr Afon in the east. Gwynedd covers an area of 225,000 hectares and has a population of approximately 120,000. The county shares its inland boundary with four other counties; Conwy, Denbighshire, Powys and Ceredigion.

Gwynedd is predominantly rural, with a low population density. The main areas of population concentration are the University City of Bangor and Gwynedd Administration centre, Caernarfon, both on the south shore of the Menai Strait to the north west of the county. Other small towns include, Pwllheli, Porthmadog, Blaenau Ffestiniog and Dolgellau.

The largest and busiest road within the county is the A55 connecting the port of Holyhead on Anglesey to the north west of England along the North Wales coast. It stretches approximately 20km through Gwynedd from Abergwyngregyn, around Bangor to the Britannia Bridge. The A470 which is the primary route between North and South Wales traverses Gwynedd from Blaenau Ffestiniog to Mallwyd in the south. Another important road is the A487 which links Caernarfon and Bangor with the south of the County before merging with the A470 at Llan Ffestiniog, then continuing from the south of Dolgellau towards, Machynlleth and beyond.

Road traffic sources are the main concern with regard to air quality in Gwynedd. The dependence of the car and an increase in the influx of traffic from tourism has increased road traffic pollution in the past but newer greener cars on our roads seem not have caused levels of nitrogen dioxide to level off in the last few years.

1.2 Purpose of Report

This report fulfils the requirements of the Local Air Quality Management process as set out in Part IV of the Environment Act (1995), the Air Quality Strategy for England, Scotland, Wales and Northern Ireland 2007 and the relevant Policy and Technical Guidance documents. The LAQM process places an obligation on all local authorities to regularly review and assess air quality in their areas, and to determine whether or not the air quality objectives are likely to be achieved. Where exceedances are considered likely, the local authority must then declare an Air Quality Management Area (AQMA) and prepare an Air Quality Action Plan (AQAP) setting out the measures it intends to put in place in pursuit of the objectives.

The objective of this Updating and Screening Assessment is to identify any matters that have changed which may lead to risk of an air quality objective being exceeded. A checklist approach and screening tools are used to identify significant new sources or changes and whether there is a need for a Detailed Assessment. The USA report

should provide an update of any outstanding information requested previously in Review and Assessment reports.

1.3 Air Quality Objectives

The air quality objectives applicable to LAQM in Wales are set out in the Air Quality (Wales) Regulations 2000, No. 1940 (Wales 138), Air Quality (Amendment) (Wales) Regulations 2002, No 3182 (Wales 298), and are shown in Table 1.1. This table shows the objectives in units of micrograms per cubic metre $\mu\text{g}/\text{m}^3$ (milligrams per cubic metre, mg/m^3 for carbon monoxide) with the number of exceedances in each year that are permitted (where applicable).

Table 1.1 Air Quality Objectives included in Regulations for the purpose of LAQM in Wales

Pollutant	Air Quality Objective		Date to be achieved by
	Concentration	Measured as	
Benzene	16.25 $\mu\text{g}/\text{m}^3$	Running annual mean	31.12.2003
	5.00 $\mu\text{g}/\text{m}^3$	Running annual mean	31.12.2010
1,3-Butadiene	2.25 $\mu\text{g}/\text{m}^3$	Running annual mean	31.12.2003
Carbon monoxide	10.0 mg/m^3	Running 8-hour mean	31.12.2003
Lead	0.5 $\mu\text{g}/\text{m}^3$	Annual mean	31.12.2004
	0.25 $\mu\text{g}/\text{m}^3$	Annual mean	31.12.2008
Nitrogen dioxide	200 $\mu\text{g}/\text{m}^3$ not to be exceeded more than 18 times a year	1-hour mean	31.12.2005
	40 $\mu\text{g}/\text{m}^3$	Annual mean	31.12.2005
Particles (PM ₁₀) (gravimetric)	50 $\mu\text{g}/\text{m}^3$, not to be exceeded more than 35 times a year	24-hour mean	31.12.2004
	40 $\mu\text{g}/\text{m}^3$	Annual mean	31.12.2004
Sulphur dioxide	350 $\mu\text{g}/\text{m}^3$, not to be exceeded more than 24 times a year	1-hour mean	31.12.2004
	125 $\mu\text{g}/\text{m}^3$, not to be exceeded more than 3 times a year	24-hour mean	31.12.2004
	266 $\mu\text{g}/\text{m}^3$, not to be exceeded more than 35 times a year	15-minute mean	31.12.2005

1.4 Summary of Previous Review and Assessments

Title Of Report	Outcomes
Gwynedd Council, Public Protection Service, Regulatory Services (2009): <i>Air Quality Update and Screening Assessment for 2008</i>	<p>No exceedances in air quality objectives from roadside Nitrogen Dioxide monitoring during 2008. Further detailed assessments not required.</p> <p>PM₁₀ monitoring carried out near steam locomotive station. No exceedance of air quality objectives</p> <p>Identification of a location not previously assessed where steam trains may cause Sulphur Dioxide air quality objectives to be exceeded. Need to proceed to a Detailed Assessment</p>
Gwynedd Council, Public Protection Service, Regulatory Department (2010): <i>Progress Report for 2009</i> .	<p>One exceedance in the annual bias adjusted mean for Nitrogen Dioxide at 1 kerbside monitoring location. Further investigation of this exceedance demonstrates that it does not pose an exposure risk to members of the public due to its location, and a prediction of exposure at the nearest location of concern confirms that the concentration falls well within the required objective.</p> <p>Still need to progress to a Detailed Assessment of Sulphur Dioxide at one identified location.</p>
Gwynedd Council, Public Protection Service, Regulatory Department (2011): <i>Progress Report for 2010</i> .	<p>Two exceedances in the annual bias adjusted mean for Nitrogen Dioxide at 1 kerbside and 1 Roadside location. Further investigation of these exceedances demonstrates that they do not pose an exposure risk to members of the public due to their location, and a prediction of exposure at the nearest locations of concern confirm that the concentrations fall well within the required objective.</p> <p>Noted that at the time of the submission of the report a Detailed Investigation of Sulphur Dioxide was underway at one identified location.</p>
Gwynedd Council, Public Protection Service, Regulatory Department (2012): 2012 Air Quality Updating and Screening Assessment	<p>Assessment of road traffic sources did not identify any need to progress to a Detailed Assessment. No issues were identified in relation to industrial sources; Commercial and domestic sources; and fugitive and uncontrolled sources.</p> <p>Stated that a Detailed Assessment of Sulphur Dioxide At Ffestiniog Railway Station would be submitted as a separate report.</p>
Gwynedd Council, Public Protection Service, Regulatory Department (2013): 2013 Air Progress Report	<p>One exceedance of the Air Quality Objective for nitrogen dioxide, however prediction of the levels at the nearest receptor confirms no relevant public exposure at the location.</p>

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Gwynedd Council, Public Protection Service,
Regulatory Department (2014)
Detailed Assessment of Sulphur Dioxide
At the Harbour Station, Ffestiniog Highland
Railway.

No exceedances of the objective for Sulphur Dioxide arising from steam locomotives at the locality, therefore no need to set up an Air Quality Management Area.

Gwynedd Council, Public Protection Service,
Regulatory Department (2014): 2014 Air
Quality Progress Report

No exceedances in the Air Quality Objective for Nitrogen Dioxide measured at kerbside, roadside or urban background locations. No requirement to progress to a Detailed Assessment.

2 New Monitoring Data

2.1 Summary of Monitoring Undertaken

2.1.1 Automatic Monitoring Sites

Gwynedd Council did not undertake any automatic monitoring during 2015

2.1.2 Non-Automatic Monitoring Sites

During 2014 Gwynedd Council monitored nitrogen dioxide at 12 different locations close to traffic sources as indicated in table 2.1 below. Maps showing all tube locations can be found in Appendix A. Tubes were supplied and analysed using Gradko International Ltd laboratories. The preparation method used was 20% TEA / Water. Analysis was carried out in accordance with laboratory's documented in house Laboratory Method GLM 6. The annual mean concentration values were achieved using a 0.92 bias adjustment supplied by the Review and Assessment website.

Table 2.2 Details of Non-Automatic Monitoring Sites

Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Is monitoring collocated with a Continuous Analyser (Y/N)	Relevant Exposure? (Y/N with distance (m) to relevant exposure)	Distance to kerb of nearest road (N/A if not applicable)	Does this location represent worst-case exposure?
GCC/002 Roundabout A487, Caernarfon (C1)	Kerbside	248273	262132	NO ₂	No	No	10m	1m	No
GCC/003 Lon Campbell, Caernarfon (C3)	Urban Background	248480	363456	NO ₂	No	No	5m	N/A	N/A
GCC/005 Ffordd Bangor, Caernarfon (C5)	Kerbside	248892	364120	NO ₂	No	No	7m	1m	Yes
GCC/008 A4087, Bangor (B3)	Kerbside	257587	371543	NO ₂	No	No	2m	1m	Yes
GCC/011 A5122, Bangor (B5)	Kerbside	256292	371663	NO ₂	No	No	Over 25m	1m	Yes
GCC/012 Faenol Roundabout, Bangor (B6)	Kerbside	254286	368835	NO ₂	No	No	Over 25m	1m	Yes
GCC/013 Bethesda	Kerbside	261529	367380	NO ₂	No	No	10m	1m	Yes

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Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Is monitoring collocated with a Continuous Analyser (Y/N)	Relevant Exposure? (Y/N with distance (m) to relevant exposure)	Distance to kerb of nearest road (N/A if not applicable)	Does this location represent worst-case exposure?
(BETH 1)									
GCC/015 Llanwnda (LL1)	Roadside	247770	358663	NO ₂	No	No	5m	2m	Y
GCC/037 Poolside, Caernarfon (C6)	Kerbside	248022	362757	NO ₂	No	No	2m	1m	Y
GCC/038 A55, Bangor (B4)	Roadside	256871	369493	NO ₂	No	No	Over 25m	2m	Y
GCC/039 A55, Bangor (CO-LOC)	Roadside	256871	369493	NO ₂	No	No	Over 25m	2m	Y
GCC/040 Pwllheli (PW1)	Kerbside	237517	335217	NO ₂	No	No	2m	1m	Y

2.2 Comparison of Monitoring Results with AQ Objectives

2.2.1 Nitrogen Dioxide

Automatic Monitoring Data

Gwynedd council do not carry out any automatic monitoring for Nitrogen Dioxide

Diffusion Tube Monitoring Data

Results from diffusion tube monitoring carried out in 2014 are shown in table 2.3 below. For comparison purposes, Table 2.4 shows the results for the past 5 years at sites that are still active. Exceedances of annual mean air quality objective of $40\mu\text{g}/\text{m}^3$ are highlighted.

The Welsh Assembly Government has adopted an Annual Mean Objective of $40\mu\text{g}/\text{m}^3$ for Nitrogen Dioxide through the use of diffusion tube monitoring. Following collation of monitoring tube data and adjustment for bias (bias adjustment value of 0.92 from Review and Assessment website) all monitoring locations were below this threshold as can be seen from Table 2.3.

Monitoring location C2 (WAQF Reference GCC – 002) which is a kerbside monitoring position adjacent to the 'Morrison's' roundabout on the A487 in Caernarfon has exceeded the $40\mu\text{g}/\text{m}^3$ objective in the past. The last time this occurred was 2012.

The Regulations make clear that likely exceedances of the objectives should be assessed in relation to *“the quality of air at locations which are situated outside buildings or other natural or man made structures, above or below ground, and where members of the public are regularly present”*. It is particularly important that Review and Assessment focuses on those locations where members of the public are likely to be regularly present and are likely to be exposed for a period of time appropriate to the averaging period of the objective. Authorities should not consider exceedances of the objectives at any location where relevant public exposure would not be realistic.

In the case of the exceedance in location C2, given its location; it does not represent a relevant risk of exposure to members of the public. Further consideration was given to the level of exposure at the nearest location which would represent a relevant public exposure which is a residential home located 5 meters from the kerbside position. Using the prediction equation in box 2.3 of LAQM.TG (09), the concentration fell below well below the annual objective.

Laxen and Marner's 2003 *Analysis of the Relationship Between 1-Hour and Annual Mean Nitrogen Dioxide at roadside and Kerbside Monitoring Sites* on behalf of

DEFRA has demonstrated that it is unlikely that 1-hour objective will be exceeded if the annual mean is less than $60 \mu\text{g}/\text{m}^3$. The annual mean at all locations has been considerably below $60 \mu\text{g}/\text{m}^3$ at all monitoring locations,

A comparison of Nitrogen Dioxide at the 12 monitoring locations within Gwynedd from 2010 - 2014 is shown in table 2.4. Levels dropped fairly markedly from 2010 to 2011, then rose at 10 of the 12 locations in 2012. All locations apart from PW 1 (GCC-040) showed a decrease from 2012 to 2013 and then remained at a similar concentration in 2014. Road traffic data from the Welsh Government

(<https://stats.wales.gov.wales/Catalogue/Transport/Roads/Road-Traffic/volumeofroadtraffic-by-localauthority-year>)

shows the highest volume of road traffic in 2012 (compared to 2010-13) at 1.28 Million Vehicle Kilometres in Gwynedd, which seems to contradict with the levels of NO_2 measured.

Table 2.3 Results of Nitrogen Dioxide Diffusion Tubes in 2014

Site ID	Location	Site Type	Within AQMA ?	Triplicate or Collocated Tube	Data Capture 2014 (%)	Data with less than 9 months has been annualised (Y/N)	Confirm if data has been distance corrected (Y/N)	Annual mean concentration (Bias Adjustment factor = 0.92)
								2014 ($\mu\text{g}/\text{m}^3$)
GCC-002	Roundabout A487, Caernarfon (C1)	Kerbside	N	N	100	n/a	N	34.28
GCC-003	Lon Campbell, Caernarfon (C3)	Urban Background	N	N	92	n/a	N	12.61
GCC-005	Ffordd Bangor, Caernarfon (C5)	Kerbside	N	N	92	n/a	N	33.00
GCC-008	A4087, Bangor (B3)	Kerbside	N	N	83	n/a	N	25.26
GCC-011	A5122, Bangor (B5)	Kerbside	N	N	75	n/a	N	23.68
GCC-012	Faenol Roundabout, Bangor (B6)	Kerbside	N	N	83	n/a	N	27.46
GCC-013	Bethesda (BETH 1)	Kerbside	N	N	100	n/a	N	21.00
GCC-015	Llanwnda (LL1)	Roadside	N	N	100	n/a	N	23.92
GCC-037	Poolside, Caernarfon (C6)	Kerbside	N	N	92	n/a	N	31.46

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Site ID	Location	Site Type	Within AQMA ?	Triplicate or Collocated Tube	Data Capture 2014 (%)	Data with less than 9 months has been annualised (Y/N)	Confirm if data has been distance corrected (Y/N)	Annual mean concentration (Bias Adjustment factor = 0.92)
								2014 ($\mu\text{g}/\text{m}^3$)
GCC-038	A55, Bangor (B4)	Roadside	N	Y	83	n/a	N	29.93
GCC-039	A55, Bangor (CO-LOC)	Roadside	N	Y	56	n/a	N	28.02
GCC-040	Pwllheli (PW1)	Kerbside	N	N	100	n/a	N	19.56

Table 2.4 Results of Nitrogen Dioxide Diffusion Tubes (2010 to 2014)

Site ID	Site Type	Within AQMA?	Annual mean concentration (adjusted for bias) $\mu\text{g}/\text{m}^3$				
			2010 (Bias Adjustment Factor = 0.99)	2011 (Bias Adjustment Factor = 0.89)	2012 (Bias Adjustment Factor = 0.97)	2013 (Bias Adjustment Factor = 0.95)	2014 (Bias Adjustment Factor = 0.92)
GCC-002	Kerbside	N	28.90 (distance corrected from 53.76 at nearest relevant exposure)	24.3 (distance corrected from 42.59 at nearest relevant exposure)	22.9 (distance corrected from 40.37 at nearest relevant exposure)	33.91	34.28
GCC-003	Urban Background	N	17.58	11.57	12.46	11.64	12.61
GCC-005	Kerbside	N	37.54	21.45	34.16	31.95	33.00
GCC-008	Kerbside	N	35.93	27.15	30.39	26.63	25.62
GCC-011	Kerbside	N	32.06	23.34	25.74	24.40	23.68
GCC-012	Kerbside	N	38.53	33.66	36.15	28.10	27.46
GCC-013	Kerbside	N	31.21	22.06	22.88	20.71	21.00
GCC-015	Roadside	N	31.11	24.91	27.05	24.23	23.92
GCC-037	Kerbside	N	No tube present during 2010	26.93	31.46	31.10	31.46
GCC-038	Roadside	N	No tube present during 2010	38.34	38.02	28.27	29.93
GCC-039	Roadside	N	No tube present during 2010	38.47	36.15	26.46	28.02
GCC-040	Kerbside	N	No tube present during 2010	18.90	25.80	29.09	19.56

2.2.2 PM₁₀

No PM₁₀ monitoring has been undertaken in Gwynedd during the fifth round of Review and Assessment of air quality.

2.2.3 Sulphur Dioxide

Gwynedd Council did not undertake any monitoring of Sulphur Dioxide over this period

2.2.4 Benzene

The Local Authority does not carry out any monitoring for Benzene as part of LAQM.

2.2.5 Other pollutants monitored

No monitoring for 1,3 Butadiene, carbon monoxide or lead has been undertaken during the last round of Review and Assessment.

2.2.6 Summary of Compliance with AQS Objectives

Gwynedd Council has examined the results from monitoring in the county. Concentrations are all below the objectives, therefore there is no need to proceed to a Detailed Assessment.

3 Road Traffic Sources

3.1 Narrow Congested Streets with Residential Properties Close to the Kerb

Gwynedd Council confirms that there are no new/newly identified congested streets with a flow above 5,000 vehicles per day and residential properties close to the kerb, that have not been adequately considered in previous rounds of Review and Assessment.

3.2 Busy Streets Where People May Spend 1-hour or More Close to Traffic

Gwynedd Council confirms that there are no new/newly identified busy streets where people may spend 1 hour or more close to traffic.

3.3 Roads with a High Flow of Buses and/or HGVs.

Gwynedd Council confirms that there are no new/newly identified roads with high flows of buses/HGVs.

3.4 Junctions

Gwynedd Council confirms that there are no new/newly identified busy junctions/busy roads.

3.5 New Roads Constructed or Proposed Since the Last Round of Review and Assessment

A bypass has been proposed on the A470 avoiding Llanwnda, Dinas, Bontnewydd and Caernarfon. Construction is not proposed to start until autumn 2017. This scheme will be discussed in more detail in subsequent reports.

Gwynedd Council has assessed new/proposed roads meeting the criteria in Section A.5 of Box 5.3 in TG(09), and concluded that it will not be necessary to proceed to a Detailed Assessment.

3.6 Roads with Significantly Changed Traffic Flows

Gwynedd Council confirms that there are no new/newly identified roads with significantly changed traffic flows.

3.7 Bus and Coach Stations

There are no Bus Stations in Gwynedd. The 2 largest bus stops, Caernarfon (4 bays) and Bangor (7 bays) do not have movements exceeding 2,500 per day.

Gwynedd Council confirms that there are no relevant bus stations in the Local Authority area.

4 Other Transport Sources

4.1 Airports

The guidance asks to consider only airports with a throughput of greater than 10 million passengers per annum. No such airports exist in Gwynedd only small airfields.

Gwynedd Council confirms that there are no airports in the Local Authority area.

4.2 Railways (Diesel and Steam Trains)

4.2.1 Stationary Trains

One location was identified, during the fourth round of Review and Assessment that fitted the criteria within Section B.2 of Box 5.4 of the Technical Guidance. This location was at the Ffestiniog and Welsh Highland Railway Station at Porthmadog at grid reference SH 570 384. It had been observed that steam locomotives were stationary for 15 minutes or more, that passengers remained on the station platform for 15 minutes or more during these periods and were within 15 meters of the locomotives. This could occur 3 times or more a day.

Gwynedd Council undertook automatic monitoring at this site during 2011 (continued into 2012) for the purpose of a Detailed Assessment of Sulphur Dioxide at the Railway Station. The report produced by Gwynedd Council concluded that there were no exceedances of the objective for Sulphur Dioxide arising from steam locomotives at the locality therefore no need to set up an Air Quality Management Area.

Gwynedd Council confirms that there are no new locations where diesel or steam trains are regularly stationary for periods of 15 minutes or more, with potential for relevant exposure within 15m.

4.2.2 Moving Trains

Table 5.1 of the Technical Guidance lists rail routes which have a heavy volume of diesel passenger trains. None of these routes passes through Gwynedd.

Gwynedd Council confirms that there are no locations with a large number of movements of diesel locomotives, and potential long-term relevant exposure within 30m.

4.3 Ports (Shipping)

Only small ports, quays and harbours exist within Gwynedd, mainly for recreational purposes.

Gwynedd Council confirms that there are no ports or shipping that meet the specified criteria within the Local Authority area.

5 Industrial Sources

5.1 Industrial Installations

A list of all Permitted Processes within Gwynedd can be found in appendix D.

5.1.1 New or Proposed Installations for which an Air Quality Assessment has been Carried Out

Gwynedd Council confirms that there are no new or proposed industrial installations for which planning approval has been granted within its area or nearby in a neighbouring authority which are likely to cause exceedances in the air quality objectives.

5.1.2 Existing Installations where Emissions have Increased Substantially or New Relevant Exposure has been introduced

Gwynedd Council confirms that there are no industrial installations with substantially increased emissions or new relevant exposure in their vicinity within its area or nearby in a neighbouring authority which are likely to cause exceedances in the air quality objectives.

5.1.3 New or Significantly Changed Installations with No Previous Air Quality Assessment

Gwynedd Council confirms that there are no new or proposed industrial installations for which planning approval has been granted within its area or nearby in a neighbouring authority which are likely to cause exceedances in the air quality objectives.

5.2 Major Fuel (Petrol) Storage Depots

From information within Box 5.5, section C2 of TG (09) for assessing major fuel (petrol depots); the situation remains unchanged in Gwynedd from the previous round of Review and Assessment.

There are no major fuel (petrol) storage depots within the Local Authority area.

5.3 Petrol Stations

Petrol Stations with an annual throughput of more than 2 million litres per year were identified in the last round of review and Assessment but none have any relevant exposure within 10m of the pumps and with a busy road of more than 30, 000 vehicles a day. This situation has not changed.

Gwynedd Council confirms that there are no petrol stations meeting the specified criteria.

5.4 Poultry Farms

Gwynedd Council confirms that there are no poultry farms meeting the criteria outlined in Section C.4 of Box 5.5 of TG(09).

6 Commercial and Domestic Sources

6.1 Biomass Combustion – Individual Installations

Some small scale biomass installations were identified during the fifth round of review and assessment but the devices were all listed as ‘exempt fireplaces’ under the The Smoke Control Areas (Exempted Fireplaces) (Wales) Order 2014.

Gwynedd Council confirms that there are no biomass combustion plants of concern in the Local Authority area.

6.2 Biomass Combustion – Combined Impacts

The likelihood of areas off combined biomass exceeding the criteria outlined in section D.1b of Box 5.8 of TG (09) is considered highly unlikely.

Gwynedd Council confirms that there are no biomass combustion plants of concern in the Local Authority area.

6.3 Domestic Solid-Fuel Burning

Areas of significant coal burning were considered during the previous rounds of Review and Assessment and concluded that it was unnecessary to proceed to a detailed assessment for SO₂ or PM₁₀.

Gwynedd Council confirms that there are no areas of significant domestic fuel use in the Local Authority area.

7 Fugitive or Uncontrolled Sources

Fugitive or uncontrolled sources which could give rise to elevated PM₁₀ were considered in the last Updating and Screening Assessment. No new locations set out in Section E of box 5.10 of the Guidance have been identified.

Gwynedd Council confirms that there are no potential sources of fugitive particulate matter emissions in the Local Authority area.

8 Conclusions and Proposed Actions

8.1 Conclusions from New Monitoring Data

Indicative monitoring was undertaken at 12 locations across the county in during 2014 at kerbside and roadside locations. Previous reports have identified location C2 (GCC-002) A487 Roundabout in Caernarfon as having the highest mean average of all locations with a kerbside exceedance of the 40ug/m³ Annual Mean Objective. During 2014 however, levels were below 40ug/m³. This was also the case during 2013.

8.2 Conclusions from Assessment of Sources

The assessment of road traffic sources did not identify any need to progress to a Detailed Assessment for nitrogen dioxide or PM₁₀.

No issues were identified in relation to industrial sources; commercial and domestic sources; and fugitive and uncontrolled sources.

8.3 Proposed Actions

We will continue to monitor nitrogen dioxide from road traffic sources at specific locations throughout the county.

9 References

Defra and the devolved Administrations (2009), *Local Air Quality Management Technical guidance LAQM.TG (09)*

AEA Energy and Environment (2008), *Diffusion tubes for Ambient NO₂ Monitoring: Practical Guidance for Laboratories and Users*

...

Appendices

Appendix A: QA:QC Data

Appendix B: Nitrogen Dioxide Monthly Diffusion Tube Data 2011

Appendix C: Diffusion Tube Location Maps

Appendix D: Environmental Permitting Regulations 2007, List of Currently Permitted Processes in Gwynedd

Appendix A: QA:QC Data

Diffusion Tube Bias Adjustment Factors

Gwynedd Council has used Nitrogen Dioxide and Sulphur Dioxide Diffusion Tubes are supplied and analysed by an accredited laboratory, Gradko International Ltd. NO₂ tubes are prepared using the 50% TEA in Water method and analysed using a QUATTRO Auto Analyser U.V Spectrophotometer. The annual mean for the NO₂ tube results has been bias adjusted by a factor of 0.92 calculated from the spreadsheet available on the review and assessment helpdesk website (spreadsheet version number 09/15)

Discussion of Choice of Factor to Use

As explained above with advice from spreadsheets on the Review and Assessment Help Desk Website.

QA/QC of automatic monitoring

No automatic monitoring was undertaken during 2014.

QA/QC of diffusion tube monitoring

The Laboratory summary performance for WASP (Workplace Analysis Scheme for Proficiency) showed that during WASP NO₂ PT Rounds 121-124 and AIR NO₂ PT rounds AR001, 3, 4 and 6 Gradko achieved 100% of results which were deemed to be satisfactory.

Appendix B: Nitrogen Dioxide Diffusion Tube Data 2014 ($\mu\text{g}/\text{m}^3$)

WAQF Ref	Gwynedd Ref	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Data Capture %	Unbiased Average	Biased Average x 0.92
GCC 002	C2	32.25	32.52	42.66	36.22	34.80	33.21	42.65	37.75	42.00	35.61	46.81	30.60	100	37.26	34.28
GCC 003	C3	11.56	13.29	17.51	14.63	13.47	10.03	13.02	12.09	13.00	12.35	19.88	-	92	13.71	12.61
GCC 005	C5	25.12	28.26	42.74	42.84	41.96	39.50	36.98	38.75	34.15	-	40.34	23.90	92	35.87	33.00
GCC 008	B3	25.64	25.61	35.23	28.05	28.21	24.80	-	-	27.21	25.69	34.23	23.78	83	27.85	25.62
GCC 011	B5	25.64	21.87	29.95	22.93	25.37	1.31	30.95	-	27.69	24.14	-	23.08	75	25.74	23.68
GCC 012	B6	24.72	23.85	35.11	29.94	29.74	36.56	-	-	32.03	23.27	39.39	23.08	83	29.85	27.46
GCC 013	BETH 1	16.23	17.29	27.71	25.23	26.18	24.47	24.39	23.91	21.12	20.00	28.47	18.97	100	22.83	21.00
GCC 015	LL 1	20.63	22.54	25.71	31.08	29.05	24.77	32.71	23.92	28.11	23.12	34.04	16.27	100	26.00	23.92
GCC 037	C6	39.54	31.18	37.24	38.22	30.84	23.38	31.20	-	23.76	38.71	52.52	29.60	92	34.20	31.46
GCC 038	B4	24.09	28.67	39.11	-	30.52	31.65	42.93	-	34.46	28.09	41.72	24.06	83	32.53	29.93
GCC 039	CO-LOC	23.42	26.48	38.43	-	-	38.70	-	-	35.14	27.87	-	23.18	58	30.46	28.02
GCC 040	PW 1	20.53	22.85	23.41	19.14	18.50	15.80	20.78	20.99	24.42	16.72	23.75	28.21	100	21.26	19.56

Monthly value above $40 \mu\text{g}/\text{m}^3$ objective for annual mean

Unusually low value assumed to be error/fault with tube. Omitted when calculating annual mean

Appendix C: Diffusion Tube Location Maps

Ysgol Ein Harglwyddes/Our Lady's School, A4087
Bangor

Site Ref: B3
WAQF Ref: GCC/008
NGR: 257587 371543



Scale/Graddfa: 1 : 1000

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Lay by A55, Penhower Isaf, Bangor

Site Ref: B 4
WAQF Ref: GCC/038
NGR: 256871 369493



Scale/Graddfa: Unknown

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Lay-by /Encilfa A55, Penhower Isaf, Bangor

Site Ref: CO-LOC
 WAQF Ref: GCC/039
 NGR: 256871 369493



Scale/Graddfa: Unknown

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A5122 Ffordd Caergybi/Hollyhead Road, Bangor

Site Ref: B 5
 WAQF Ref: GCC/011
 NGR: 256292 371663



Scale/Graddfa 1: 1000

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Faenol Roundabout, Bangor

Site Ref: B 6
 WAQF Ref: GCC/012
 NGR: 254286 368835



Scale/Graddfa: 1 : 2000

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A5 Bethesda

Site Ref: BETH 1
 WAQF Ref: GCC/013
 NGR: 261529 367380



Scale/Graddfa 1: 1000

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Roundabout nr./Cylchfan wrth Morrisons, A487 Caernarfon

Site Ref: C 2
 WAQF Ref: GCC/002
 NGR: 248147 363112



Scale/Graddfa 1 : 1000

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Cyffordd Lon Campbell a Ffordd Dewi Sant/Junction Campbell Rd. & St. David's Rd, Caernarfon



Site Ref: C 3
 WAQF Ref: GCC/003
 NGR: 248489 363448



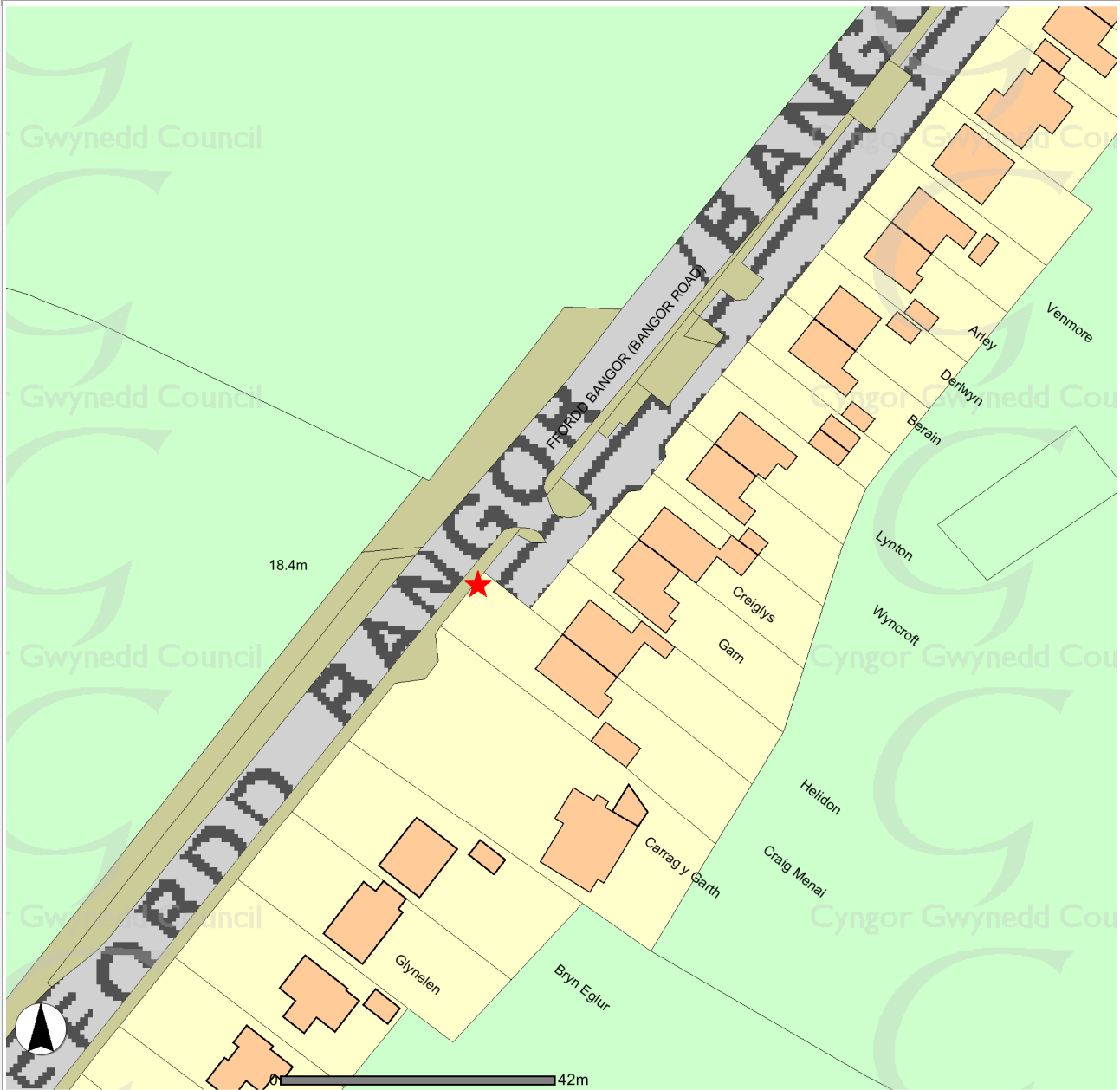
Graddfa/scale 1: 1000

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Ffordd Bangor, A487 Caernarfon

Site Ref: C5
 WAQF Ref: GCC/005
 NGR: 248892 364120



Scale/Graddfa 1 : 1000

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Penllyn, Caernarfon

Site Ref: C 6
 WAQF Ref: GCC/037
 NGR: 248022 362757



Graddfa/Scale: Unknown

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A487, Llanwnda

Site Ref: LL 1
 WAQF Ref: GCC/015
 NGR: 247770 358553



Scale/Graddfa 1 : 1000

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Cyffordd Stryd Penlan a Stryd Fawr / Penlan Street and High Street Junction, Pwllheli.

Site Ref: PW 1
 WAQF Ref: GCC/040
 NGR: 237517 335216



Scale/Graddfa : Unknown

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Appendix D: Environmental Permitting Regulations 2007: List of Currently Permitted Processes

Permit Reference No	Type (Part)	Operator	Process Address	Grid Reference	Process Undertaken	Guidance Note
BL9941	A1	South Caernarfon Creameries Ltd	Rhyd-y-Gwystl, Chwilog, Pwllheli LL53 6SB	SH 405 391	Treating and processing of milk >200 tonnes per day	-
EPR/LP3037XK	A1	Rehau Ltd	Tanygrisiau, Blaenau Ffestiniog, Gwynedd LL41 9RY	SH 690 449	PVC Compounding and Lamination	-
ARF/EPA/009/A/93	B	Welsh Slate Ltd	Penrhyn Quarry, Bethesda, Bangor, Gwynedd, LL57 4YG	SH 620 650	Quarry Process	PG3/08
ARF/EPA/006/93	B	Hogan Brothers (Asphalt) Ltd	Caernarfon Road, Bangor, Gwynedd, LL57 4DA	SH 563 698	Quarry Process Including Road Stone Plant	PG3/15a
ARF/EPA/005/93	B	Hogan Brothers (Concrete) Ltd	Caernarfon Road, Bangor, Gwynedd, LL57 4DA	SH 563 698	Blending, Packing, Loading and Use of Bulk Cement	PG3/01
ARF/EPA/01/93/PPC2	B	Hanson Aggregates Premix Concrete	Bangor Plant, Bangor, Gwynedd, LL574HN	SH 590 730	Blending, Packing, Loading and Use of Bulk Cement	PG3/01
ARF/EPA/007/93PPC8	B	Cemex UK Materials Ltd	Unit 34, Llandegai Industrial Estate, Llandegai, Bangor, Gwynedd, LL57	SH 593 711	Blending, Packing, Loading and Use of Bulk Cement	PG3/01
ARF/PPC/20	B	National welsh Fuels Ltd	Railway Goods Yard, Bangor, Gwynedd, LL57 2TX	SH 573 716	Storage, Unloading and Loading Petrol at Terminals	PG1/13
ARF/EPA/015/93	B	Dennis Ferranti Meters Ltd	Caernarfon Road, Bangor, Gwynedd, LL57 4SP	SH 569 708	Coating of Metal and Plastic	PG6/23
ARF/EPA/001/01	B	Gwynedd Skip and Plant Hire Ltd	Lon Hen Felin, Cibyn Industrial Estate, Caernarfon, Gwynedd, LL55 2BD	SH 470 529	Mobile Crushing Plant	PG3/08

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ARF/EPA/004/92	B	Bangor Crematorium	Amlogsgfa Bangor, Ffordd Llandygai, Llandygai, Bangor, Gwynedd, LL57 4H	SH 592 716	Crematoria	PG5/2
ARF/EPA/013/92	B (RF)	Silver Star Services	3 Lon Cae Darby, Cibyn Industrial Estate, Caernarfon, Gwynedd, LL55 2B	SH 505 550	Waste Oil Burner Less Than 014MW Net Rated Thermal Input	PG1/1
DWY/CEM/92/GLANB	B	Pothmadog Concrete Ltd	Glan Byl, Criccieth, Gwynedd, LL52 0RD	SH 527 409	Blending, Packing, Loading and Use of Bulk Cement	PG3/01
DWY/CEM/97/RHOSF		Pothmadog Concrete Ltd	Rhosfawr, Pwllheli, Gwynedd, LL53 6NF	SH 380 396	Blending, Packing, Loading and Use of Bulk Cement	PG3/01
DWY/VP43/842/LP/SEJ	B (RF)	Berwyn Coaches (B & M Japheth)	Berwyn Garage, Unit 1 Trefor Workshops, Trefor, Gwynedd, LL54 5LL	SH 370 368	Waste Oil Burner Less Than 014MW Net Rated Thermal Input	PG1/1
MER/008/A	B	Tarmac Quarry Products	Minffordd, Penrhyndeudraeth, Gwynedd, LL48 6HP	SH 594 390	Quarry Process Including Road Stone Coating Plant	PG3/08 & PG3/15a
MER/PPC/508610	B	Concrete Sarnau Ltd	Erw Feurig, Cefnddwysarn, Bala, Gwynedd, LL23 7LL	SH 967 390	Blending, Packing, Loading and Use of Bulk Cement	PG3/01
MER/005/B	B	Hanson Aggregates Premix	Minffordd Quarry, Minffordd, Penrhyndeudraeth, Gwynedd, LL48 6HP	SH 593 390	Blending, Packing, Loading and Use of Bulk Cement	PG3/01
MER/003/B	B	Welsh Slate Ltd	Welsh Slate Ltd, Blaenau Ffestiniog, Gwynedd, LL41 3ND	SH 696 474	Quarry Process Including Road Stone Plant	PG3/08 & PG3/15a
ARF/PPC/01/06	B (RF)	Johnsons The Cleaners	18 Stryd Y Llyn, Caernarfon, Gwynedd, LL55 2AB	SH 480 626	Dry Cleaning	PG6/4
ARF/EPA/002/98/PPC/11	B (RF)	Texeco Garth Service Station	Beach Road, Bangor, Gwynedd, LL57 1AB	SH 585 729	Petrol Vapour	PG1/14

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ARF/EPA/005/98/PPC/14	B (RF)	Gwalia garage (Londis)	Gwalia Garage, Caeathro, Caernarfon, Gwynedd, LL55 2SS	SH 503 615	Petrol Vapour	PG1/14
ARF/EPA/007/98/PPC/16	B (RF)	Bryn Llwyd Service Station	Caernarfon Road, Bangor, Gwynedd, LL57 4SU	SH 566 703	Petrol Vapour	PG1/14
ARF/PPC/002/09	B (RF)	Tesco Filling Station	Tesco Extra, Ffordd Caernarfon, Bangor, Gwynedd, LL57 4SU	SH 563 700	Petrol Vapour II	PG1/14
ARF/EPA/001/09/PPC/15	B (RF)	Morrisons Service Station	Ffordd Y Gogledd, Caernarfon, Gwynedd, LL55 1BE	SH 482 632	Petrol Vapour II	PG1/14
ARF/EPA/003/98/PPC/12	B (RF)	Esso Llys y Gwynt, Bangor	Llys Y Gwynt Services, A5/A55 Llandegai Interchange, Bangor, Gwynedd, LL57 4BG	SH 591 696	Petrol Vapour	PG1/14
ARF/EPA/008/98/PPC17	B (RF)	Caer Service Station	Caer Service Station, Lôn Parc, Caernarfon, Gwynedd, LL55 2HP	SH 482 624	Petrol Vapour	PG1/14
ARF/EPA/011/92	B (RF)	Modurdy Dolydd Garage	Dolydd Garage, Y Groeslon, Caernarfon, Gwynedd, LL54 7EF	SH 475 571	Waste oil Burner Less Than 014MW Net Rated Thermal Input	PG1/1
ARF/EPA/007/98/PPC/13	B (RF)	Beran Filling Station	Deiniolen, Caernarfon, Gwynedd LL55 3NF	SH 570 647	Petrol Vapour	PG1/14
M/PVR/98/ME	B (RF)	Mile End Service Station	A470 Lon Arran, Dolgellau, Gwynedd, LL40 2AB	SH 182 744	Petrol Vapour	PG1/14
M/PVR/02/WP	B (RF)	W D Pugh & Son Ltd	Bala Road, Dolgellau, Gwynedd, LL40 2YE	SH 729 180	Petrol Vapour	PG1/14
M/PVR/02/HG	B (RF)	H G Thomas Motors	Dyffryn Garage, Glan Yr Afon, Corwen, Gwynedd, LL21 0HA	SJ 026425	Petrol Vapour	PG1/14
M/PVR/02/SO	B (RF)	Spar Oak Garage	High Street, Tywyn, Gwynedd, LL36 9AD	SH 584 007	Petrol Vapour	PG1/14
M/PVR/98/MB	B (RF)	Moduron y Bala	West End Garage, Bala, Gwynedd, LL23 7AE	SH 358 924	Petrol Vapour	PG1/14
M/PVR/98/PR	B (RF)	Allan Green	Park Road Garage, Penrhyndeudraeth,	SH 392 614	Petrol Vapour	PG1/14

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			Gwynedd, LL48 6LS			
MER/010	B (RF)	Modurdy Lluest	Modurdy Lluest, Penrhyndeudraeth, Gwynedd, LL48 6AF	SH 612 389	Waste Oil Burner Less Than 014MW Net Rated Thermal Input	PG1/1
MER/PVR/5060	B (RF)	Smithy Garage	High Street, Dyffryn Ardudwy LL44 2EN	SH 587 229	Petrol Vapour	PG1/14
MER/PVR/6399	B (RF)	Beacon Filling Station	Ffordd Bryncrug, Tywyn LL36 9RT	SH 590 010	Petrol Vapour	PG1/14
MEIR/PPC/01/06	B (RF)	Cambrian Cleaners Ltd	Nant Road, Harlech, Gwynedd, LL46 2UE	SH 582 314	Dry Cleaning	PG6/4
DWY/DC/06/LLYN	B (RF)	Llyn Cleaners	83 Stryd Fawr, Pwllheli, Gwynedd, LL53 5RR	SH 374 352	Dry Cleaning	PG6/4
DWY/PVR/98/PULROSE	B (RF)	Pulrose Motor Service Ltd	Ala Road, Pwllheli, Gwynedd, LL53 5TA	SH 364 347	Petrol Vapour	PG1/14
DWY/PVR/98/LLANBED	B (RF)	Llandedrog Service Station	Beach Road, Llanbedrog, Pwllheli, Gwynedd, LL53 7TN	SH 326 317	Petrol Vapour	PG1/14
DWY/PVR/98/GLANDON	B (RF)	Glandon Filling Station	Caernarfon Road, Pwllheli, Gwynedd, LL53 5LF	SH 377 355	Petrol Vapour	PG1/14
DWY/PVR/02/MADOG	B (RF)	Madog Garage	Cricieth Road, Porthmadog, Gwynedd, LL49 9NY	SH 506 382	Petrol Vapour	PG1/14
DWY/PVR/98/SHELL	B (RF)	Shell Porthmadog	High Street, Porthmadog, Gwynedd, LL49 9NG	SH 333 320	Petrol Vapour II	PG1/14
DWY/PVR/98/PANDY	B (RF)	Modurdy Deudraeth Garage	Deudraeth Garage, Stryd y Castell, Penrhyndeudraeth. LL48 6AL	SH 454 378	Waste Oil Burner Less Than 014MW Net Rated Thermal Input	PG1/1
DWY/PVR/04/TESCO	B (RF)	Tesco Filling Station	Stryd Fawr, Porthmadog, Gwynedd, LL49 9NU	SH 566 389	Petrol Vapour II	PG1/14
DWY/PVR/98/DOLWAR	B (RF)	Dolwar Service Station	Y Ffor, Pwllheli, Gwynedd, LL53 6UR	SH 389 389	Petrol Vapour	PG1/14
MER/NCP/508984	B	E W Jones Plant Hire	Hendre mawr, Frongoch, Bala. LL23 7SA	SH 911 381	Mobile Crushing Plant	PG3/08
MER/PPC/ID 21185	B	G H James Cyf	Unit 1-3, Utica Building, Trawsfynydd, Blaenau Ffestiniog. LL41 4DU	SH 695 389	Mobile Crushing Plant	PG3/08

