

# Impact of COVID 19 lockdown on Air Quality in Carmarthenshire

## NO<sub>2</sub> Diffusion Tube Study

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Cyngor **Sir Gâr**  
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## **Purpose**

The purpose of this report is to study the effect of the COVID 19 Pandemic lockdown on Air Quality within Carmarthenshire, regarding levels of Nitrogen Dioxide (NO<sub>2</sub>) predominantly from sources of traffic. Comparisons will be made to the monthly measured data obtained from sites within the Air Quality Management Areas (AQMA's) in Llandeilo, Carmarthen and Llanelli as well as some other busy parts of the County where Nitrogen Dioxide (NO<sub>2</sub>) monitoring is routinely conducted under Local Air Quality Management duties.

## **Introduction**

Following the 'Stay at home' messages from Welsh Government introduced on 23<sup>rd</sup> March 2020, a noticeable reduction of traffic was observed UK wide, people were told to work from home where possible to do so and schools closed a week beforehand on 16<sup>th</sup> March 2020. This is an opportune time to assess what 'best case' improvements to Air Quality can be achieved through significantly changing activity around travel, where unnecessary journeys are avoided, school traffic is removed and a large proportion of the population find alternative ways of working and meeting up.

It must be accepted that although the data will provide a snapshot of changes observed during 2020 in comparison with years 2019 and 2018. The changes will not only relate to the COVID 19 lockdown measures because weather will also play a significant part.

## **Background**

As part of the statutory functions under Local Air Quality Management, the Council routinely monitors Nitrogen Dioxide on the roadside in many different areas in the County and reacts to concerns relating to traffic pollution that may be causing elevated levels of pollution in distinct areas. Air Quality Management Areas have been declared in Llandeilo, Llanelli and Carmarthen and actions plan were developed with the aim to improving air quality in those town centres.

This study will not only build a better picture of what can potentially be achieved from changing behaviour and limiting non-essential travel in the AQMA's, particularly where they have observed exceedances for many years, but it could also illustrate the need for even more action to ensure that we can continue to keep the monitored locations below the Air Quality Objective once activities returns back to normality.

The Air Quality Objective is an annual average and not a monthly target, however for the purpose of this report it is illustrated to put the figures into some sort of context. After all the more each monthly level stays below the objective level the greater the chance that the annual average will not be exceeded.

The diffusion tube preparation, supply and analysis was performed by Socotec Didcot Laboratory and the preparation method is acetone:triethanolamine 50:50.

## Llandeilo

Figure 1.0: Map of the current monitoring sites in Llandeilo, area in red denotes AQMA boundary.

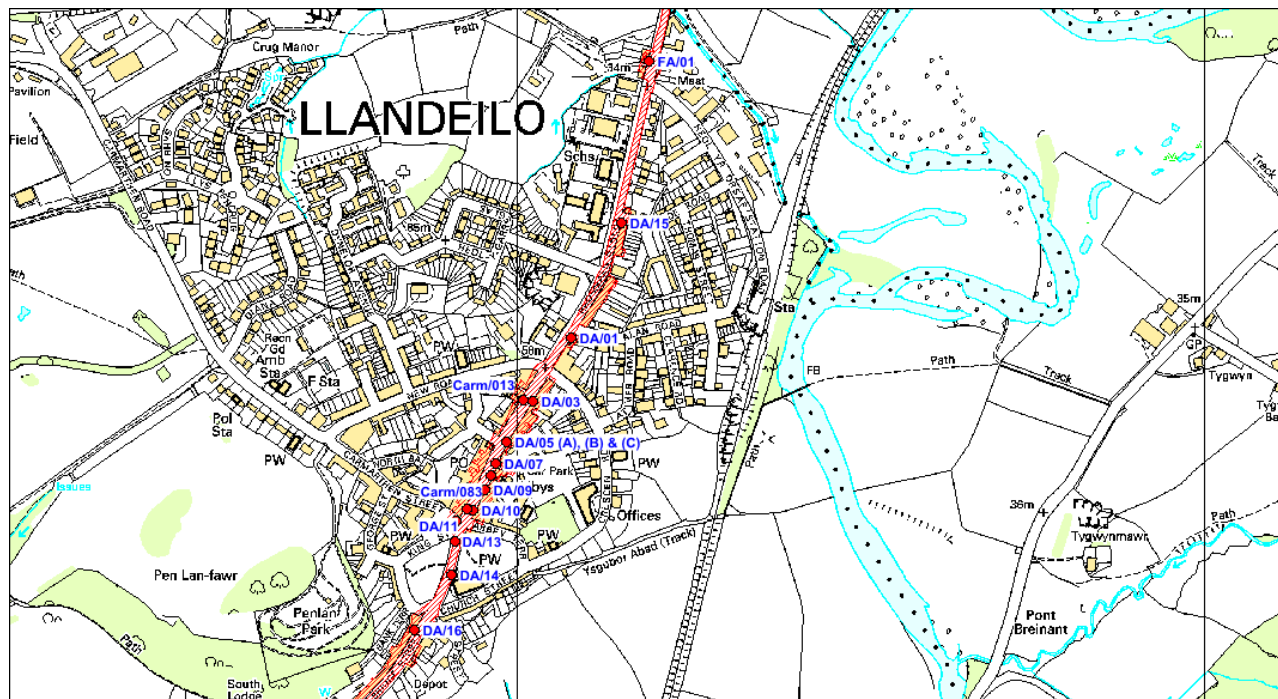


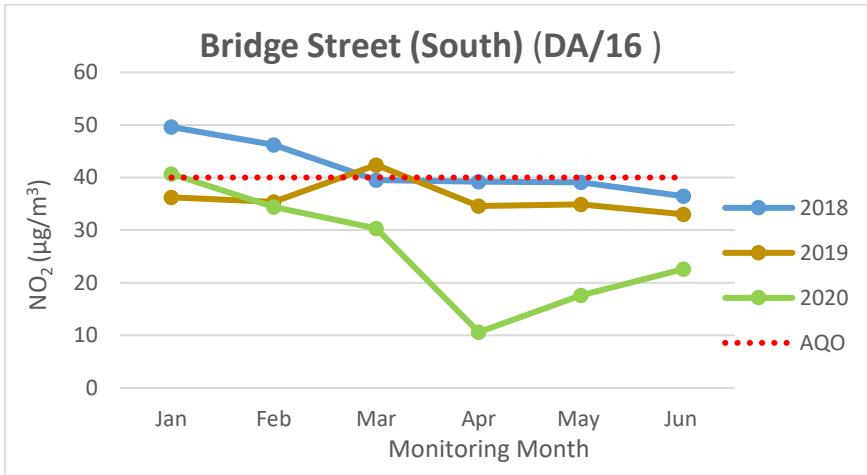
Table 1: Results of a selection of sites within Llandeilo AQMA

Llandeilo	Site ID	Year	Jan	Feb	Mar	Apr	May	June
Bridge Street (South)	DA/16	2018	49.6	46.2	39.5	39.2	39.1	36.5
		2019	36.2	35.4	42.4	34.6	34.9	33.0
		2020	40.7	34.4	30.3	10.6	17.6	22.6
Rhosmaen Street Park Area	DA/13	2018	40.6	44.2	48.8	47.0	46.0	40.7
		2019	46.3	50.1	41.5	41.7	35.9	38.2
		2020	45.5	26.3	28.4	18.8	19.8	25
Rhosmaen Street (2)	Carm/083	2018	53.6	51.4	65.7	39.3	56.3	55.3
		2019	55.5	51.8	46.6	60.5	44.6	44.7
		2020	53.6	34.4	35.7	31.0	28.1	31.3
Castle Hotel	DA/07	2018	50.9	52.9	53.4	50.9	48.7	47.4
		2019	45.1	39.8	44.7	53.1	42.5	42.2
		2020	51.9	36.1	32.5	23.7	25.4	29.3
Evans Butchers	DA/05	2018	47.5	49.9	52.4	44.6	44.6	40.0
		2019	47.4	39.7	37.1	47.3	37.2	35.1
		2020	48.4	32.1	32.9	23.0	22.6	26.9

COVID 19 Lockdown  
 Lockdown restrictions started to ease

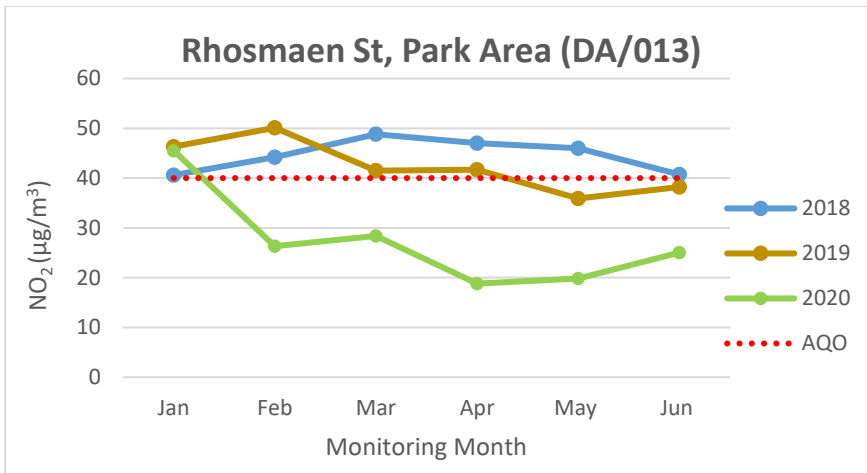
The following graphs illustrate the monthly trends at various sites within Llandeilo's AQMA.

**Figure 1.1**



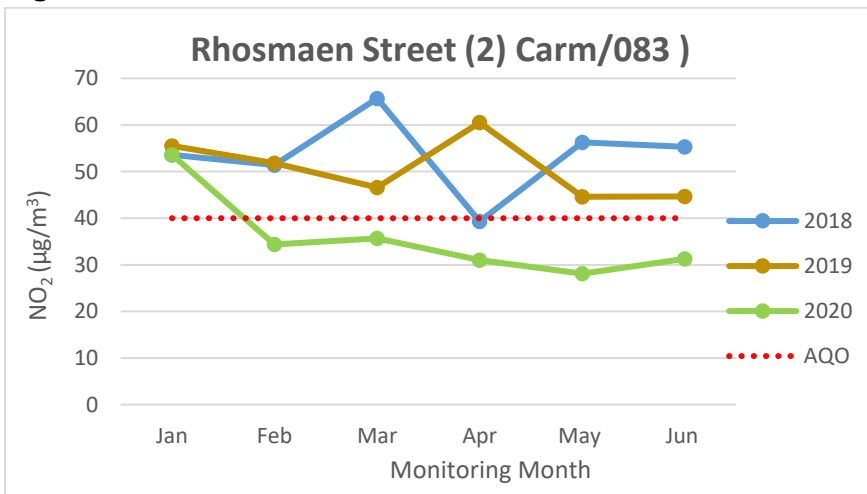
The Bridge Street site is at a property south of Llandeilo, just before the Church Street junction and traffic travelling into Llandeilo from Ffairfach climb an uphill gradient. A significant reduction was observed in April 2020 during the lockdown, compared to previous years; 24µg/m<sup>3</sup> less than in April 2019.

**Figure 1.2**



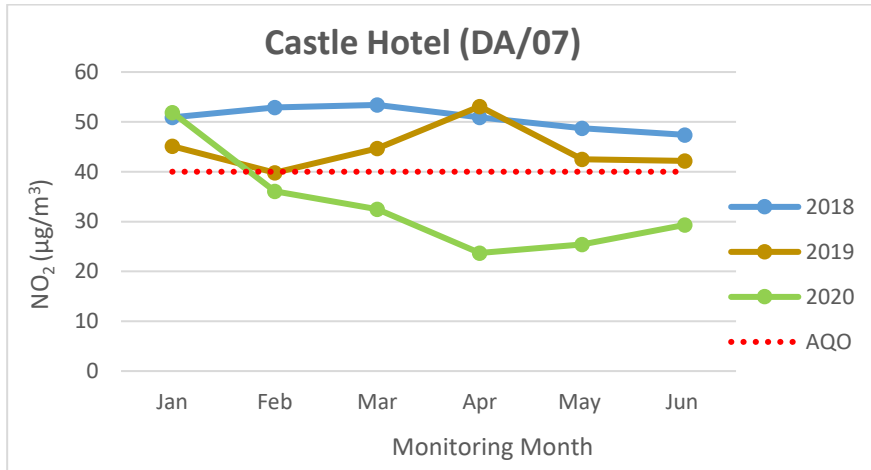
The park site is located slightly further north to the Bridge Street site, just before the turning to King Street. Traffic must often wait here when larger vehicles are passing from the opposite direction. 2020 has seen a significant decrease since February, and similarly to Bridge Street a large reduction in April 2020 compared to 2019.

**Figure 1.3**



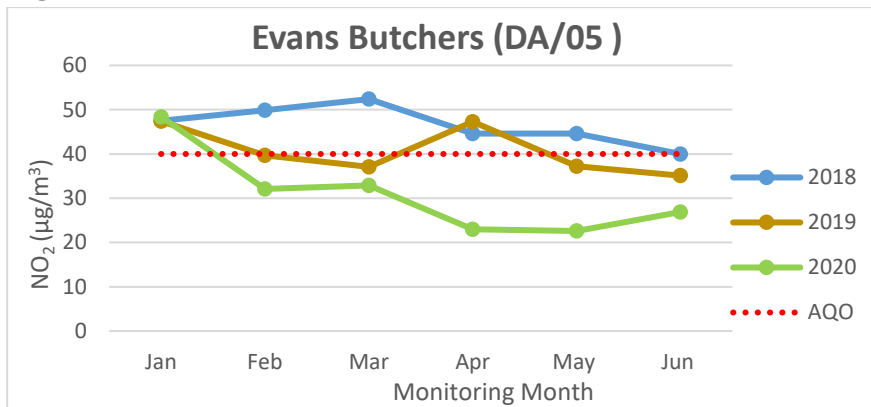
This site is located opposite the Angel Hotel where the road and pavements both narrow with three storey buildings either side. Although measurements have reduced since February in comparison to previous years, the levels are not as low as observed at the sites above. Yet April 2020 is still 29µg/m<sup>3</sup> lower than 2019.

**Figure 1.4**



This site is located further north at the Castle Hotel where the narrow road continues but buildings are reduced to two storeys. Again, a large reduction was observed in April 2020 compared to previous years, and although February 2020 was only slightly lower than February 2019, it reduced significantly from the start of the year.

**Figure 1.5**



This site is positioned on a three-storey building in the middle of Rhosmaen Street and a three-storey building is sat opposite, both have two-storey buildings either side on both sides of the road. Similar trends are observed to the Castle Hotel for all years between 2018 to 2020.

## Summary of Results

All the Llandeilo sites appear to follow similar downward trends and most certainly experience a drop in measured levels during April 2020, when the lockdown was fully in place. It's interesting to observe that in January 2020, measurements at most of the Llandeilo sites were not too dissimilar to that observed in the previous two years, however the February and March 2020 measured levels for all sites fell below 40µg/m<sup>3</sup>. This could be attributed by the changes in weather conditions, as February was an extremely windy month. There are also two schools in Rhosmaen Street which closed on 16<sup>th</sup> March, along with the lockdown starting on 24<sup>th</sup> March, which may have resulted in fewer vehicles for a proportion of that month and a reduction in NO<sub>2</sub> levels. This is not as noticeable in Figures 1.2, 1.3 and 1.5 where the monitoring sites are surrounded by 3 storey buildings, as March 2020 levels were marginally higher than February 2020. It is likely that this demonstrates how the canyon effect fails to disperse pollutants as easily as in the more open sites. Although the Park area is much more open, it is also on an uphill gradient and those turning into King Street would likely accelerate into this junction.

The site which experienced the lowest reduction in April 2020 level was Bridge Street, Gerwyn's Fruit and Veg has remained closed since 23<sup>rd</sup> March so there has not been parked vehicles causing other traffic to wait around this area to pass. This may have contributed to this difference along with other factors. Overall, there is a reduction in measurements observed in comparison to the previous years and all five sites measured below 40µg/m<sup>3</sup> from February 2020.

## Carmarthen

Figure 2.0: Map of the current monitoring sites in Carmarthen, area in red denotes AQMA boundary.

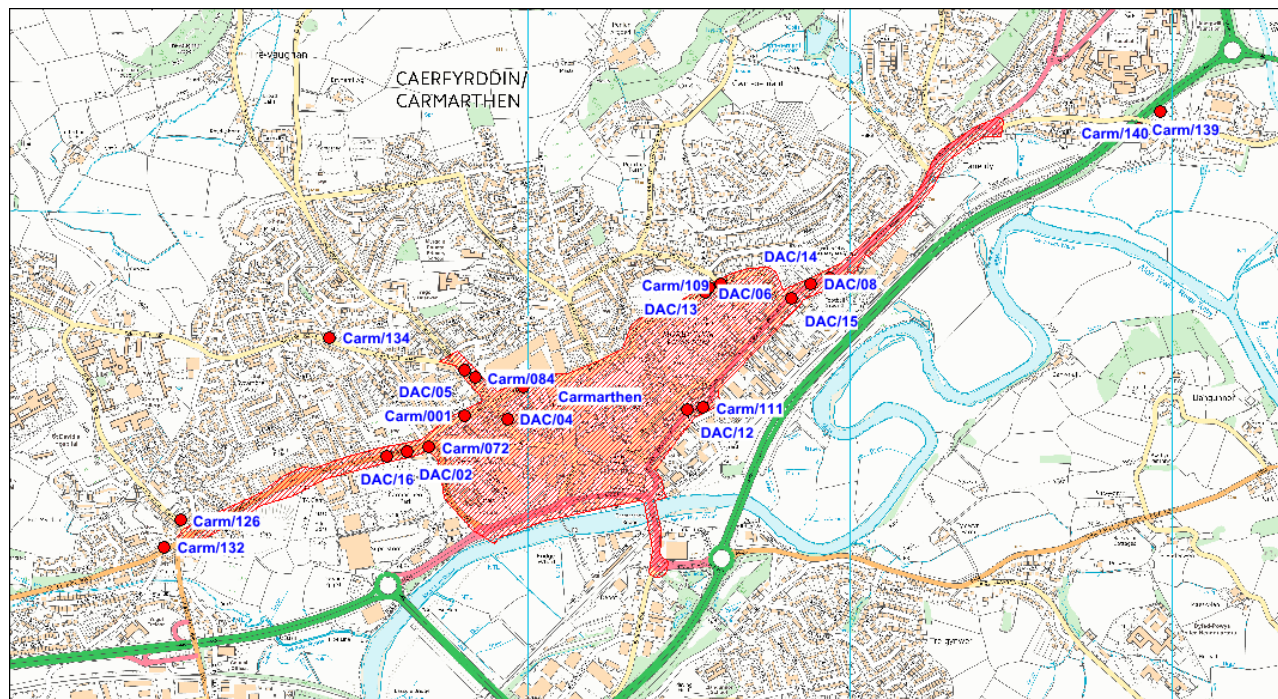


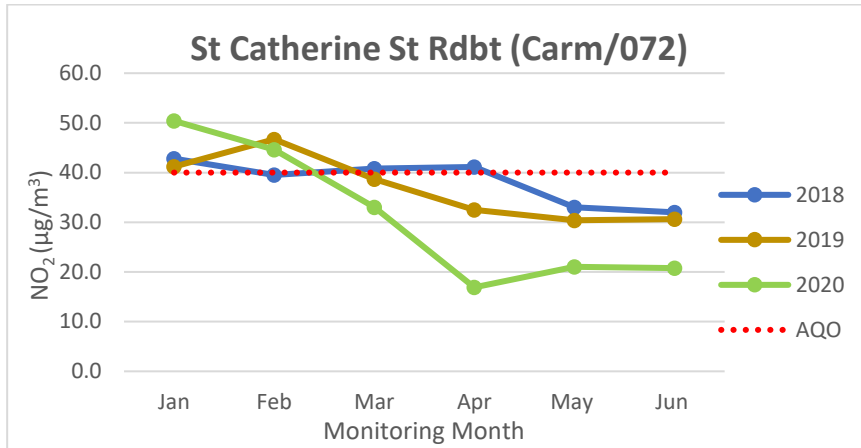
Table 2: Results of a selection of sites within Carmarthen AQMA

Carmarthen	Site ID	Year	Jan	Feb	Mar	Apr	May	June
St Catherine Street rdbt	Carm/072	2018	42.8	39.5	40.8	41.1	33.0	32.0
		2019	41.2	46.7	38.7	32.5	30.4	30.6
		2020	50.4	44.6	33.0	16.9	21.0	20.8
St Catherine Street (A) (Before St Catherine's Walk carpark)	Carm/106	2018	55.2	48.4	45.5	37.9	42.6	35.7
		2019	58.7	43.7	50.9	35.9	35.6	34.2
		2020	54.2	39.9	32.3	19.7	19.4	18.9
Richmond Terrace	Carm/109	2018	56.6	54.7	54.9	45.2	45.3	40.3
		2019	55.9	49.6	43.0	49.1	36.1	34.4
		2020	53.2	42.6	34.1	22.0	21.4	23.7
85 Priory Street (E)	DAC/08	2018	67.5	67.6	69.5	64.5	62.5	60.5
		2019	-	68.4	71.2	54.6	60.9	58.3
		2020	73.8	52.8	46.3	34.3	34.4	42.6
50 Priory Street	DAC/14	2018	53.8	49.7	45.9	39.0	36.7	34.7
		2019	53.8	55.2	44.6	37.2	32.0	32.2
		2020	53.5	34.6	27.2	18.9	18.9	26

COVID 19 Lockdown  
 Lockdown restrictions started to ease

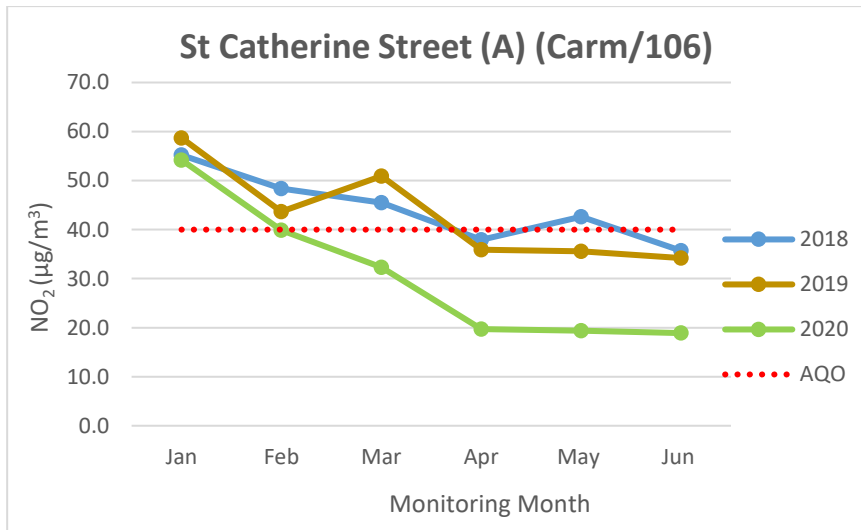
The following graphs illustrate the monthly trends at various sites within Carmarthen's AQMA.

**Figure 2.1**



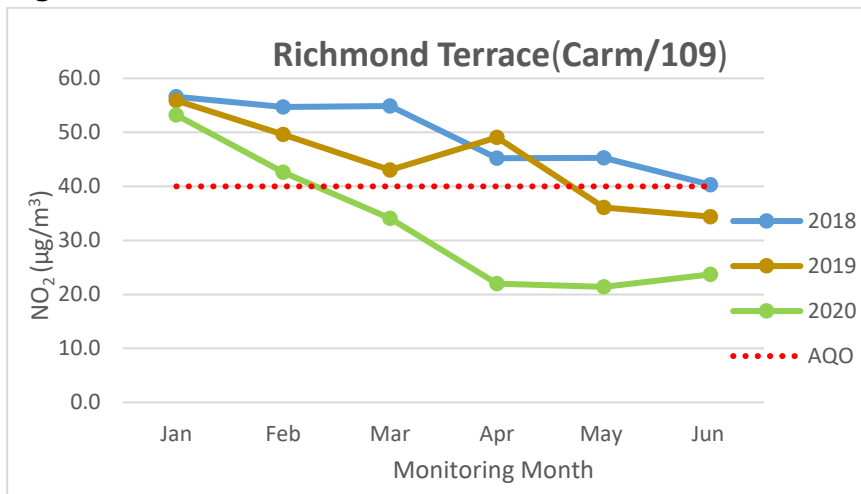
This site is near a busy roundabout leading to Picton Terrace, St Catherine's Street and Morfa Lane. Although 2020 levels were higher in January compared to previous years, a significant reduction was observed in April 2020 during the lockdown, compared to 2018 and 2019.

**Figure 2.2**



This site is located near the traffic lights, just before the turning for St Catherine's St carpark. Each side of the street has two long rows of terraced houses. 2020 levels were marginally lower than levels observed during January and February 2019, however whilst observing a similar trend to 2019, a significant reduction was observed in April to June 2020 – around 50% reduction in NO<sub>2</sub>.

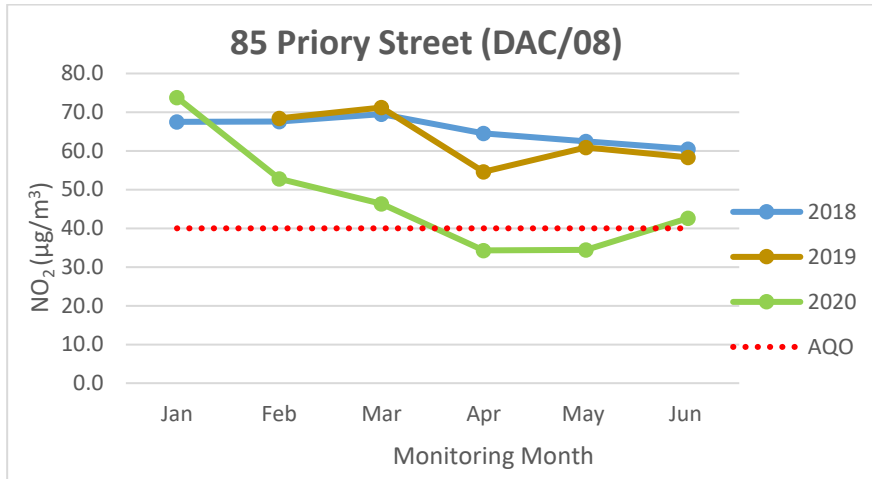
**Figure 2.3**



This site is located opposite the junction for Long Acre Road and just before the rear access to Richmond Park School. Richmond Terrace also consists of a long stretch of terraced houses on one side of the road. Measurements for 2018-2020 have followed similar patterns to that in St Catherine St above, though 2018-19 mostly remained above 40.

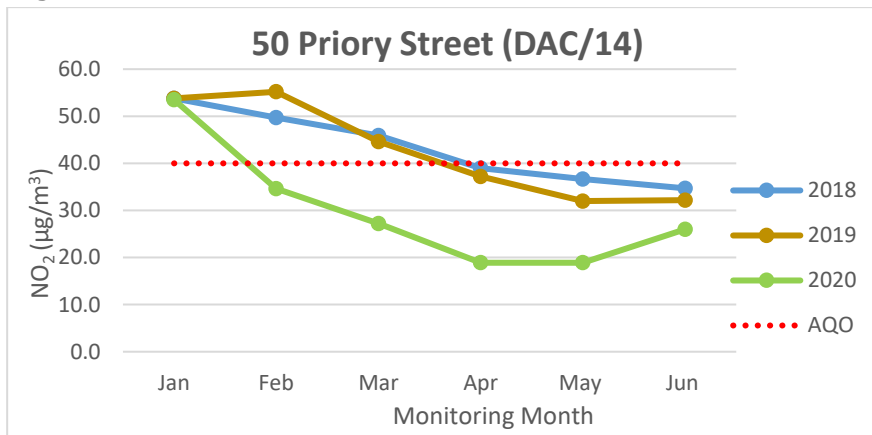


**Figure 2.4**



This site is located further east of Carmarthen after the Old Oak Roundabout. Measurements at this site are the highest for the County and have continued to exceed the annual AQO for the last 8 years. This is the first time that we have observed any monthly figure fall below 40µg/m<sup>3</sup> for this site, since monitoring began in 2012.

**Figure 2.5**



This site is located further east of the site above and near the traffic lights. Each side of the street is made up of rows of terraced houses. Although January figures are the same for each year, 2020 figures have reduced by approximately 37% and 39% in February and March 2020, and 49% in April 2020 in comparison to 2019.

## Summary of Results

All the Carmarthen sites follow a similar trend for 2020 and observe a significant drop in measured levels during the April 2020 lockdown. Similarly, to Llandeilo January 2020, measurements were not too dissimilar to that observed in the previous two years, yet St Catherine Street Roundabout and 85 Priory Street started off higher in January 2020 compared to previous years. In March 2020, measured levels for most sites fell below 40µg/m<sup>3</sup> except for 85 Priory Street which although observed a downward trend since January this year, only April and May 2020 measured levels fell below 40µg/m<sup>3</sup> with readings of 34µg/m<sup>3</sup>. This demonstrates the importance of changing activity to significantly reduce the amount of traffic travelling through this area. Where most sites have observed reading in the 20's or lower during April 2020, this site remains in the 30's as a best-case scenario. It is therefore concerning, as seen in June 2020 that as soon as travel increases again the monthly readings for this site will continue to rise above 40µg/m<sup>3</sup>.

Overall, there is a reduction in measurements observed in comparison to the previous years and all sites measured below 40µg/m<sup>3</sup> during April and May 2020. Changes in weather conditions will also have played some part in the downward trend since February 2020. Whilst April and May 2020 observed similar levels of NO<sub>2</sub>, this did increase during June in the eastern sites of Carmarthen Town Centre, suggesting that the change in travel behaviour has had a significant benefit on NO<sub>2</sub> levels.

## Llanelli

Figure 3.0: Map of the current monitoring sites in Llanelli, area in red denotes AQMA boundary.

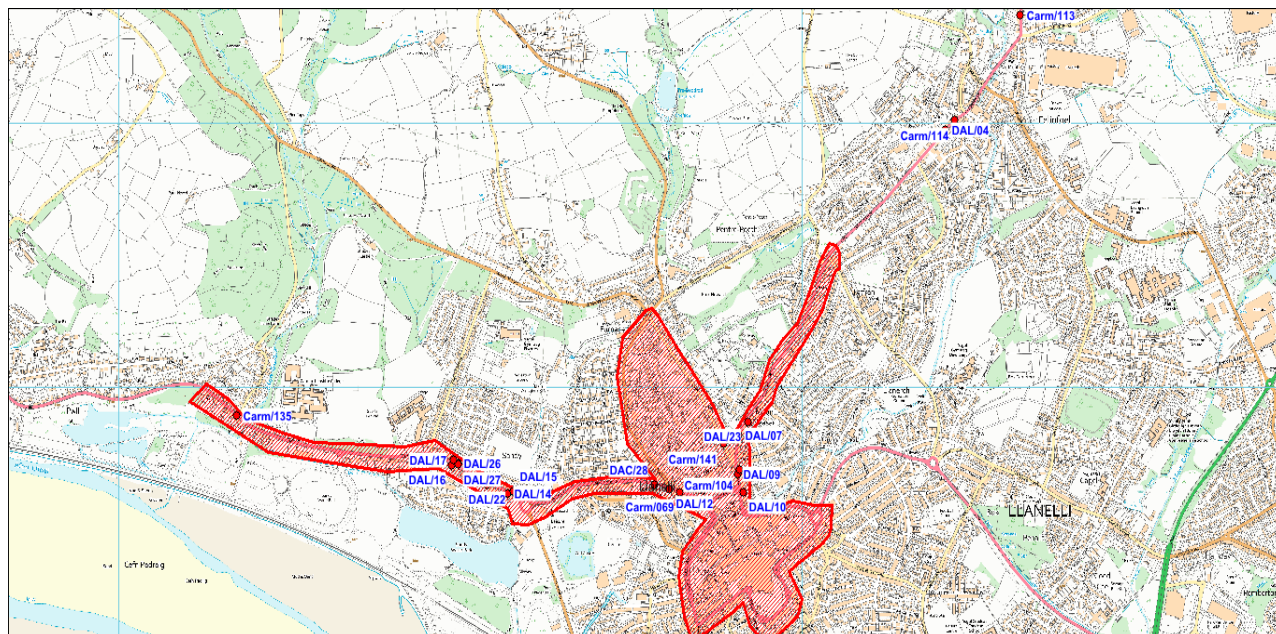


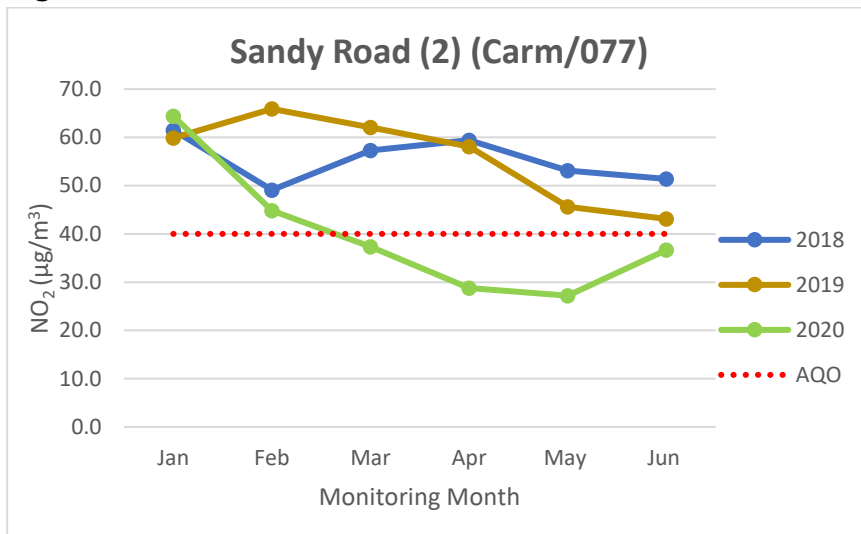
Table 3: Results of a selection of sites within Llanelli AQMA

Llanelli	Site ID	Year	Jan	Feb	Mar	Apr	May	June
Sandy Road (2)	Carm/077	2018	61.5	49.1	57.3	59.4	53.1	51.4
		2019	59.9	65.9	62.1	58.1	45.6	43.1
		2020	64.4	44.8	37.3	28.8	27.2	36.7
West End	DAL/12	2018	45.8	36.9	41.3	39.4	33.5	30.8
		2019	58.8	45.5	45.8	47.8	43.8	30.8
		2020	42.0	28.4	24.8	21.4	20.6	15.7
nr 13 Felinfoel Road	DAL/07	2018	61.9	54.3	58.7	63.9	58.3	58.7
		2019	76.8	-	56.6	-	50.9	45.6
		2020	65.4	46.8	38.9	28.4	26.8	40.1
Thomas Street (Barnardos) (Outside Willow Estate)	DAL/09	2018	52.5	53.5	54.6	43.2	54.1	52.9
		2019	55.4	58.4	61.4	46.0	47.3	45.6
		2020	63.0	53.3	38.0	24.8	25.3	38
Panteg Road	Carm/114	2018	52.9	43.0	44.0	42.6	43.5	37.1
		2019	54.7	49.6	46.3	-	32.8	33.1
		2020	55.0	34.4	30.4	21.2	20.3	26.6

COVID 19 Lockdown  
 Lockdown restrictions started to ease

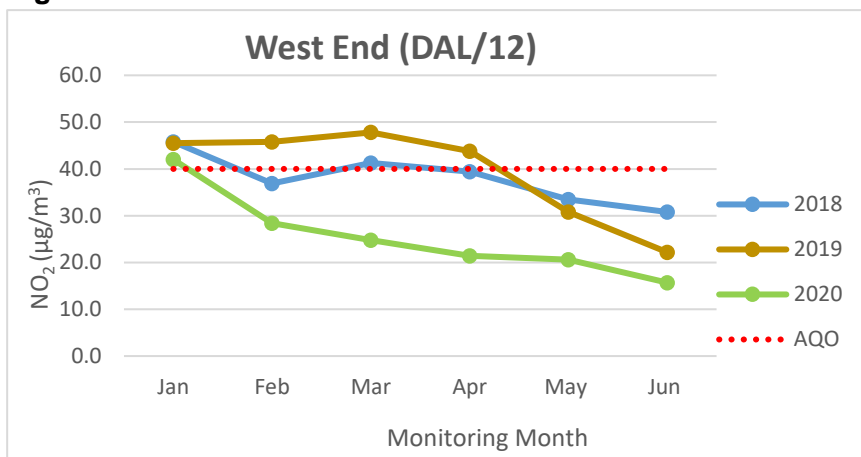
The following graphs illustrate the monthly trends at various sites within Llanelli's AQMA.

**Figure 3.1**



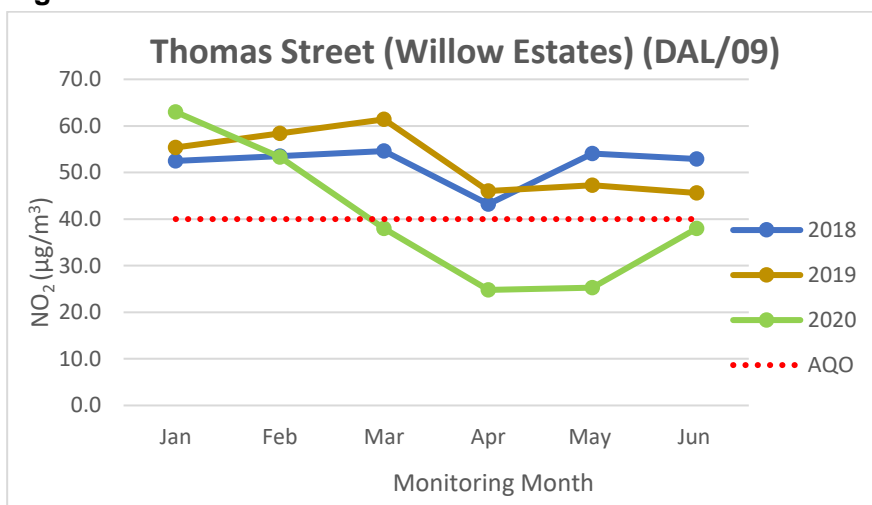
Sandy Road consists of a two long rows of terraced houses either side with a set of traffic lights in the middle. As the main route into Llanelli from the West, traffic can easily build up during peak times and the landscape does not allow pollutants to disperse so easily. March to May 2020 measured much lower levels compared to 2018-19, demonstrating the benefits of reduced in traffic.

**Figure 3.2**



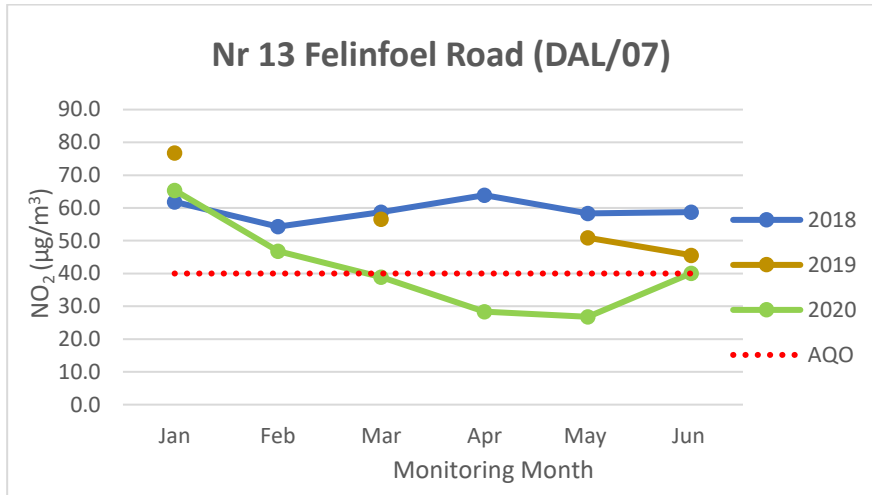
The West End Site is located opposite the turning for New Road. Measurements for 2020 have remained lower than the previous two years and this difference is more noticeable between the months of February and May. In comparison to 2019 March and April 2020 measurements are 50% lower.

**Figure 3.3**



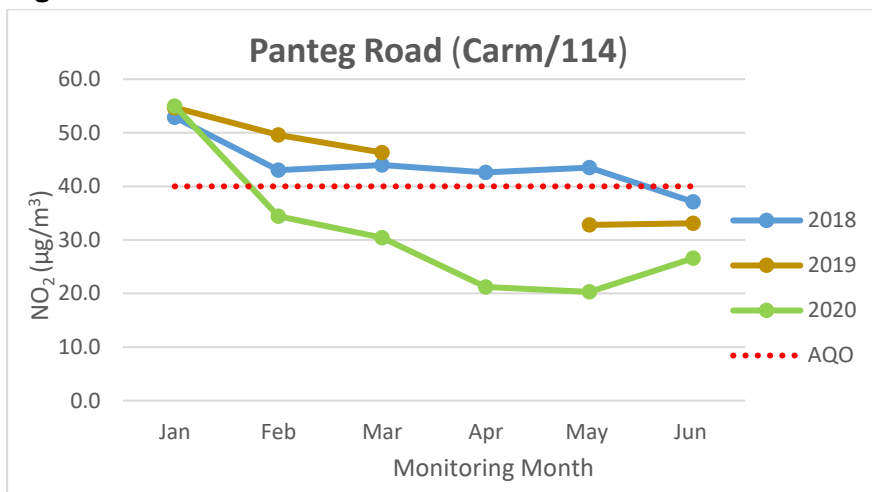
This site in Thomas Street has often exceeded the annual AQO, it's located before the turning for Old Road. There is an uphill gradient, so traffic accelerates harder. January 2020 had higher levels than in 2018-19. 2020 levels observed a similar trend to 2019 from March to May but with measurements 21-23µg/m<sup>3</sup> lower.

**Figure 3.4**



This site is further north of the Thomas Street site above, positioned further up the hill and has two rows of terraced houses each side of the road. Although February and April data are missing for 2019, this site in Llanelli has exceeded the AQO for the last 7 years and observes the highest NO<sub>2</sub> levels in Llanelli. The last time its monthly figure fell below 40 was August 2015.

**Figure 3.5**



Panteg Road is much further east of Llanelli just before the mini roundabout joining Farmers Row, this site has not exceeded the AQO but is closely monitored as some monthly figures are above 40µg/m<sup>3</sup>. January to April 2020 has observed a similar downward trend to other sites across Llanelli, and April and May 2020 have seen a 50% reduction to that in 2018.

## Summary of Results

All the Llanelli sites follow a similar downward trend for 2020 and observe a significant drop in measured levels during April 2020, after the lockdown started. Similarly, to Llandeilo and Carmarthen in January 2020, measurements were often higher than 2018, with three of these sites Sandy Road, Thomas Street (Willow Estates) and Panteg Road starting off with higher levels in January 2020 compared to both previous years.

In March 2020, measured levels for all these sites fell below 40µg/m<sup>3</sup>, but surprisingly February 2020 measured levels remained above 40µg/m<sup>3</sup> for three of the sites, despite the extremely windy weather that was experienced. The change in activity during April and May 2020 significantly reducing the amount of traffic travelling through these areas appears to have reduced measured readings in the 20's, which is a significant improvement. However, at some sites the levels have increased in June.

Overall, there is a reduction in measurements observed in comparison to the previous years and all sites measured below 40µg/m<sup>3</sup> during March to May 2020, however it must be accepted that changes in weather conditions will also have influenced results observed.

## Other Sites

Maps of other monitoring sites in Carmarthenshire, not within an AQMA

Figure 4.0 Burry Port

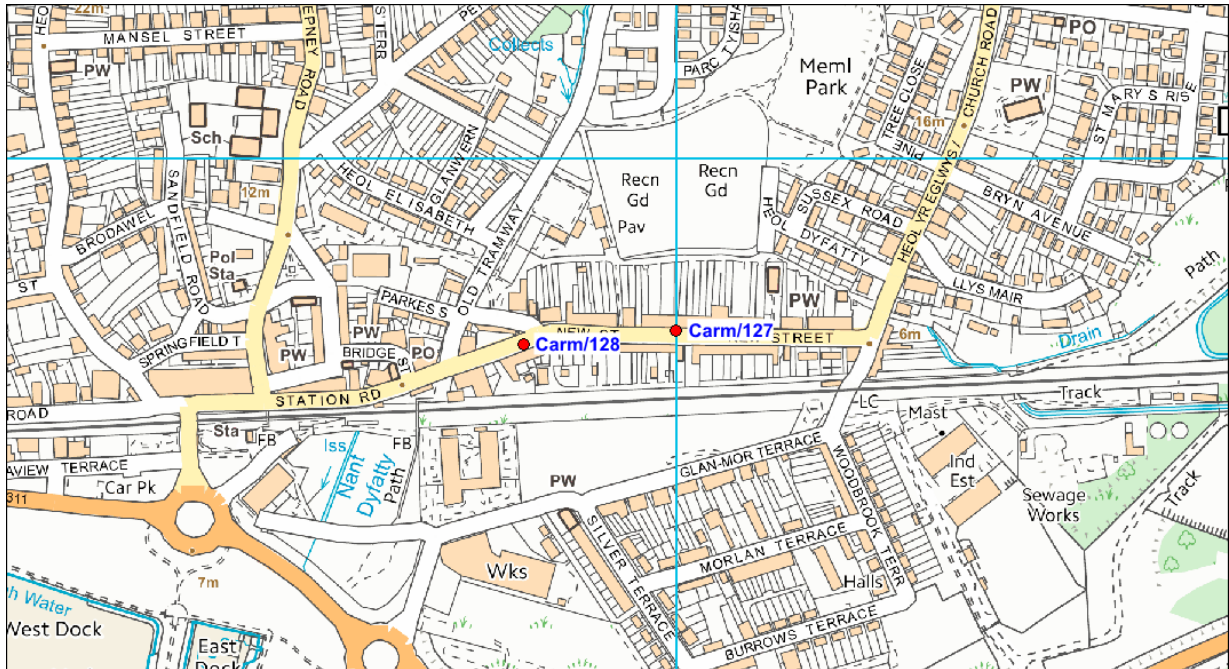
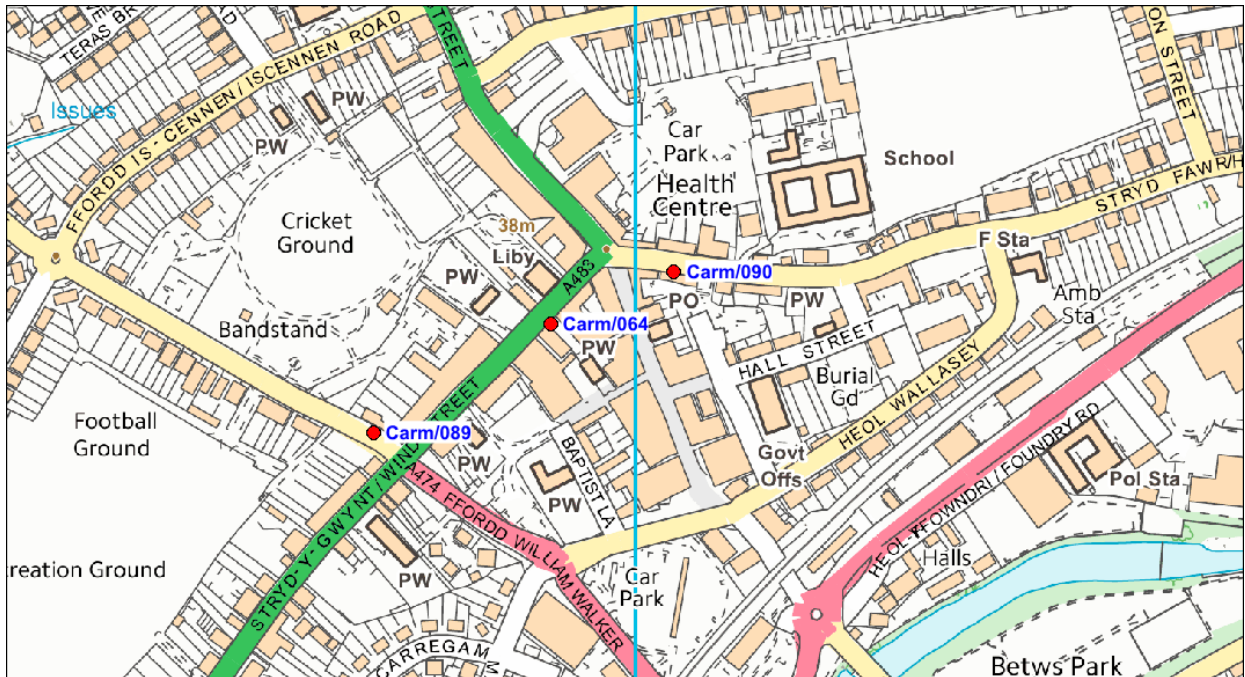
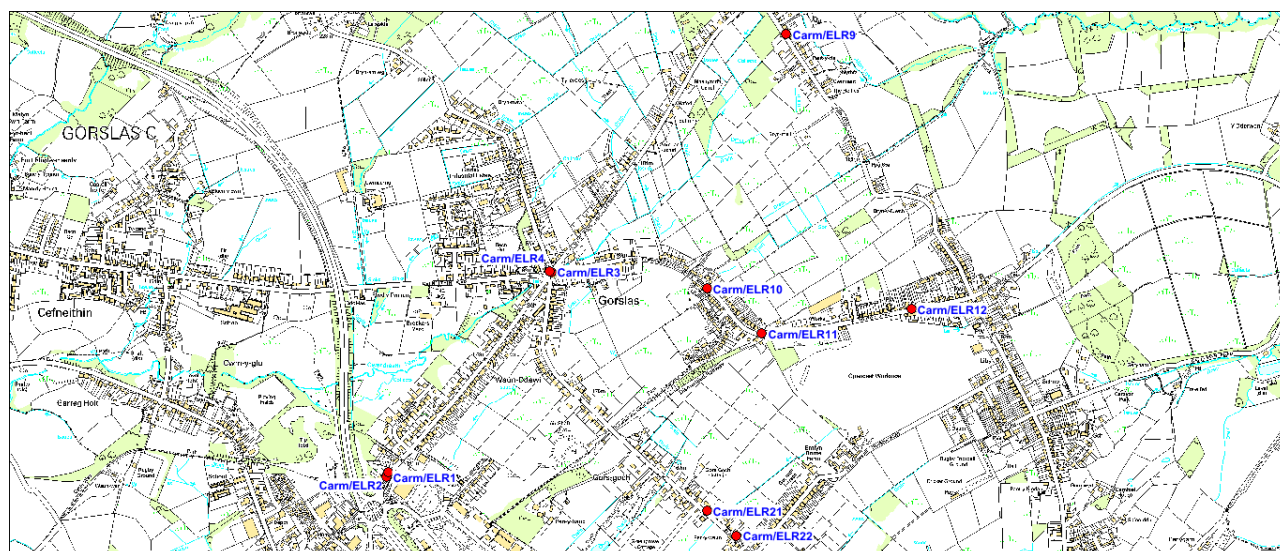


Figure 4.1 Ammanford



**Figure 4.2 Cross Hands/Gorslas**



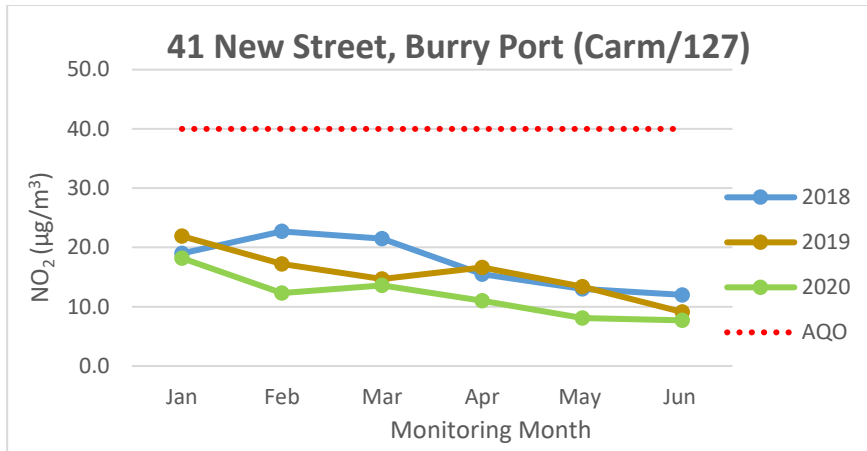
**Table 4: Results of the selection of other sites in Carmarthenshire**

Others	Site ID	Year	Jan	Feb	Mar	Apr	May	June
Burry Port -41 New Street	Carm/127	2018	19.0	22.7	21.5	15.5	13.0	12.0
		2019	21.9	17.2	14.7	16.6	13.4	9.1
		2020	18.2	12.3	13.6	11.0	8.1	7.7
Burry Port - Station Rd, Lloyds Bank	Carm/128	2018	22.8	21.4	22.6	19.2	18.9	18.0
		2019	22.7	21.7	18.3	18.7	16.8	13.4
		2020	22.9	-	13.8	14.9	10.7	11.5
Ammanford -Tirydail Lane(2)	Carm/089	2018	30.8	41.9	39.1	32.3	26.5	29.7
		2019	29.8	25.4	25.2	28.2	22.3	18.0
		2020	30.3	17.7	18.9	15.1	13.4	14.4
Ammanford, - Wind Street	Carm/064	2018	35.8	37.5	33.1	31.2	29.7	25.8
		2019	34.7	30.3	26.4	31.7	25.9	21.9
		2020	38.4	24.3	23.5	28.9	15.7	18
Ammanford - High Street (2)	Carm/090	2018	38.7	27.2	40.3	34.5	35.9	33.1
		2019	42.6	48.2	31.7	31.3	31.1	27.6
		2020	43.0	29.9	28.3	17.5	16.7	19.3
Cross Hands (2)(rdbt)	Carm/ELR1	2018	48.4	39.3	43.6	45.7	47.7	40.2
		2019	46.2	52.8	40.0	46.9	39.2	32.3
		2020	50.3	33.7	23.7	22.2	21.3	23.3
Gorslas Sixways (2)	Carm/ELR4	2018	22.4	21.3	22.4	17.6	17.9	16.2
		2019	21.6	23.2	18.6	18.1	16.4	11.6
		2020	24.8	12.7	13.8	-	8.3	10.6

COVID 19 Lockdown  
 Lockdown restrictions started to ease

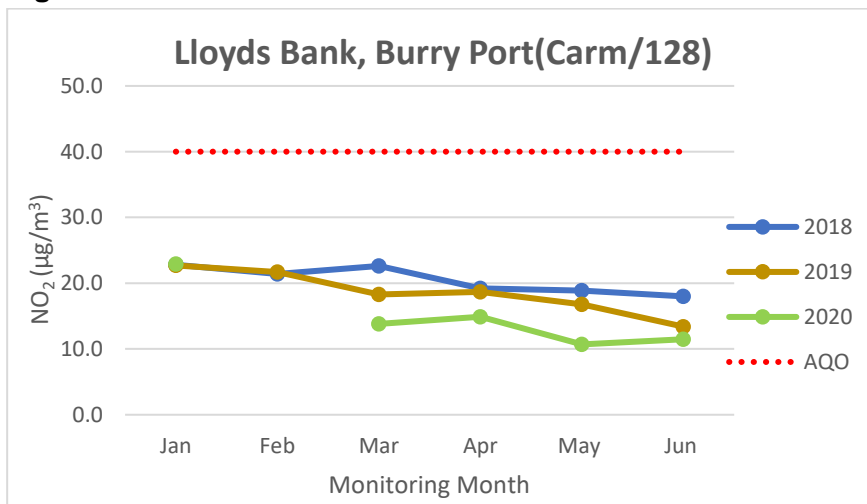
The following graphs illustrate the monthly trends at various sites across Carmarthenshire which do not have Air Quality Management Areas including Burry Port, Ammanford, Cross Hands and Gorslas.

**Figure 4.3**



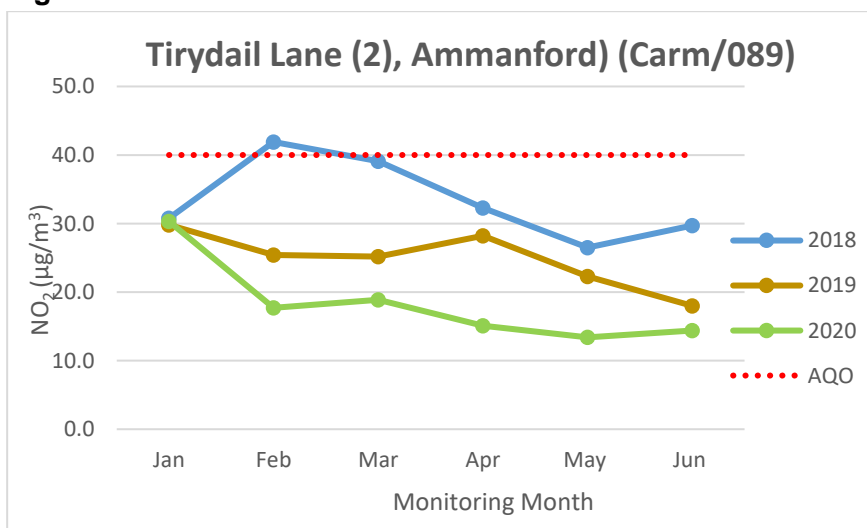
This monitoring site is in a residential area consisting of rows of terraced houses either side of the road. It's also one of the main access routes into and out of Burry Port town centre from the A484. A small improvement has been observed during 2020 in comparison to 2019.

**Figure 4.4**



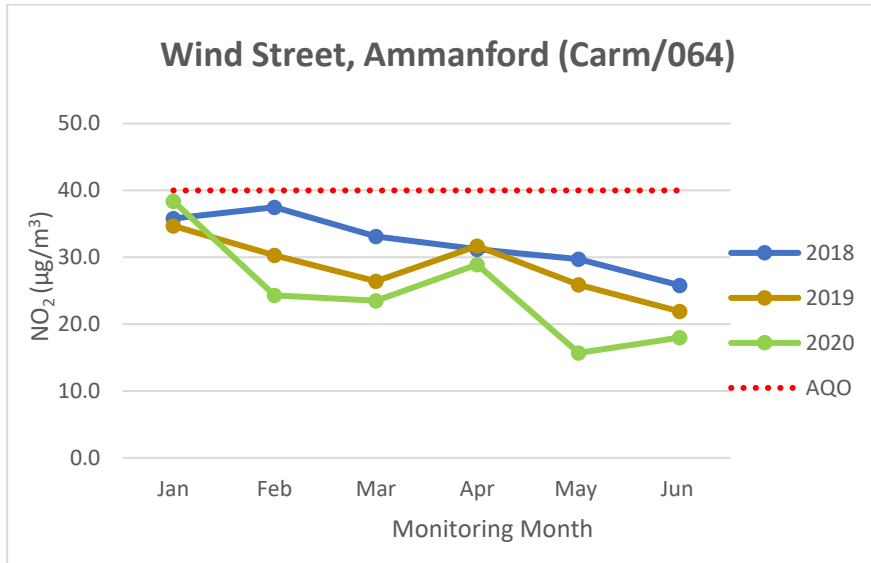
This monitoring site is closer to Burry Port town centre on Station Road. There are three terraced properties each side of the road, one side three-storey the other two-storey. Although data was unavailable for February 2020, January levels were the same for 2018-2020, March 2020 saw a decrease, but April 2020 increased marginally from March, in a similar pattern to 2019.

**Figure 4.5**



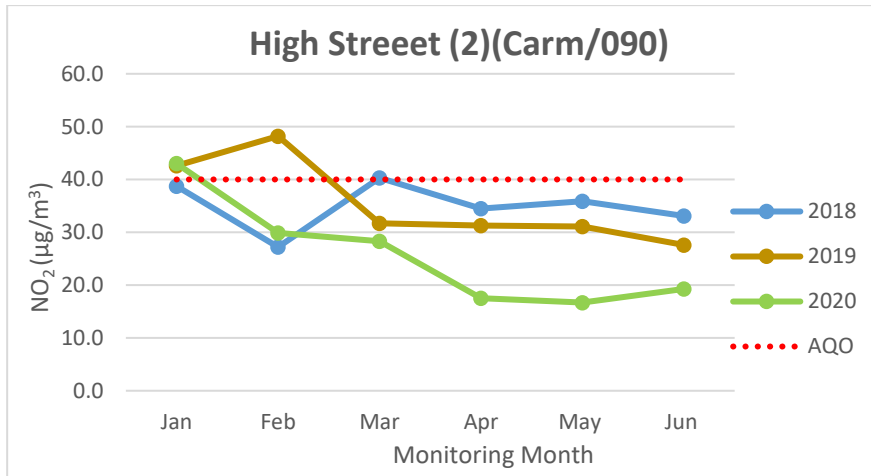
This monitoring site is located near Bush House Veterinary on Tirydail Lane. Works began to build a roundabout in early 2018 which completed February 2019 and improved traffic flows. 2020 results illustrate a similar trend to New Street, Burry Port in 2020, because January results are like previous years, March was marginally higher than February and April was just slightly lower than February.

**Figure 4.6**



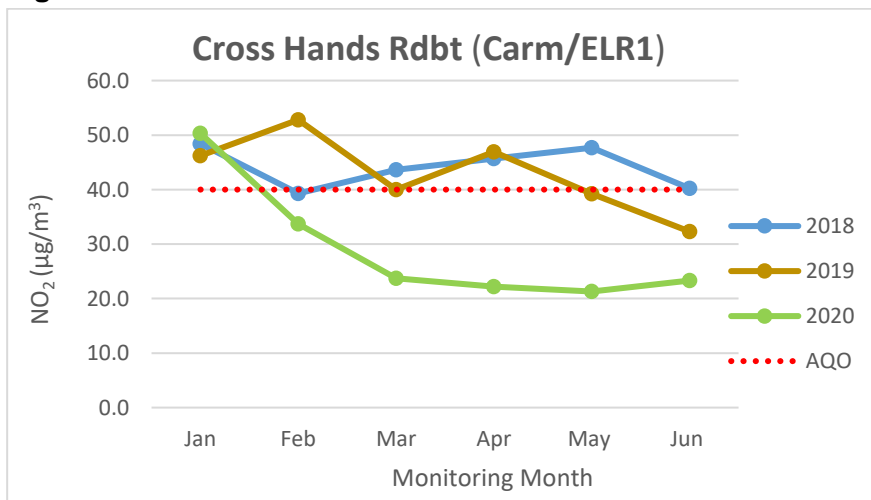
This site is in the middle of Wind Street next to the Crisp and Fry chip shop. The street is part of the A483 trunk road, and the properties are mostly terraced. Although Feb-April 2020 results are lower than previous years, very little reduction was noticed in March 2020 compared to February 2020, and April 2020 results increased, in a similar pattern to 2019. The biggest decrease was seen in May 2020.

**Figure 4.7**



This site is located next to the Cwtch café, the properties in this area are terraced both sides and there are traffic lights nearby at the square. The 2020 results for this site follows a similar downward trend to that seen in sites within the AQMA's, with significant reduction in April 2020, levels remaining the same in May and starting to increase in June.

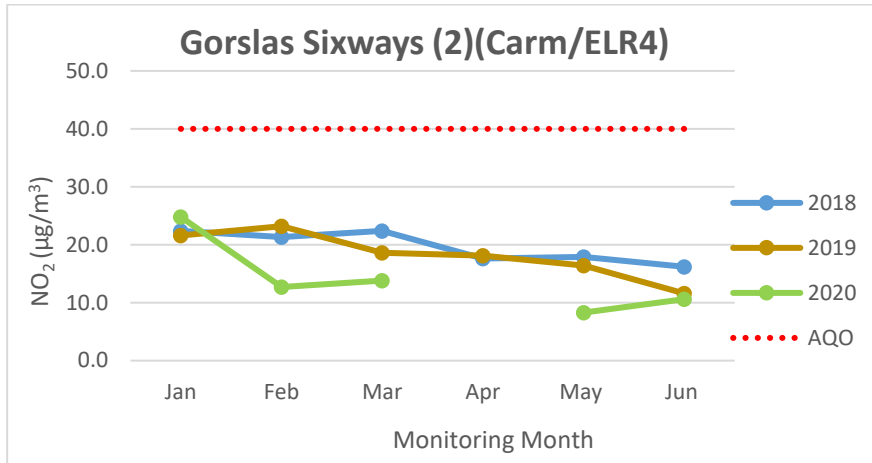
**Figure 4.8**



This kerbside site is on Llandeilo Road further uphill past the entrance to KFC. The uphill gradient from the roundabout causes vehicles to accelerate harder, so it does observe high monthly readings. In 2020, however a significant reduction in NO<sub>2</sub> was measured in February to June compared to previous years.



**Figure 4.9**



This site is at the Sixways junction, unfortunately the diffusion tube was missing for April 2020, however we already observed a decline in NO<sub>2</sub> levels for February and March 2020 compared to previous years, March 2020 was marginally higher than February 2020, however May 2020 observed much lower results.

## Summary of Results

All the sites follow a downward trend for 2020 in comparison to 2018 and 2019, however not all observe a significant drop in measured levels during April 2020, when the lockdown was fully in place. Similarly, to the AQMA sites in Llandeilo, Carmarthen and Llanelli; NO<sub>2</sub> measurements in January 2020 were often higher or at a similar level as seen in January 2018 and 2019, and all these 'other' sites experienced a reduction in measurements during February 2020, the windiest month. Overall a reduction of 30 – 49% was observed in February 2020 compared to January 2020. Four of these sites measured a reduction between 12µg/m<sup>3</sup>-16µg/m<sup>3</sup>, New Street however, saw the smallest decrease from these winds with a reduction of 5.6µg/m<sup>3</sup>, yet it still gave the lowest NO<sub>2</sub> result for all 'other' sites.

In March and April 2020 measured trends for these sites were not as consistent as that seen in the AQMA's. Whilst High Street in Ammanford and Cross Hands Roundabout observed a similar downward trend to the AQMA sites. New Street in Burry Port, Tirydail Lane in Ammanford and Sixways junction in Gorslas however, all had marginal increases in March 2020 compared to February 2020. Nevertheless, all three of these sites had much lower NO<sub>2</sub> measurements below 20µg/m<sup>3</sup>.

Interestingly, Wind Street in Ammanford and Station Road in Burry Port both measured an increase in NO<sub>2</sub> levels in April 2020 compared to March 2020 and followed the same pattern as seen in 2019. It is not clear why we are seeing this increase when there has been a general reduction in non-essential travel and a reduction across the County during April 2020. The butchers in Wind Street continued to stay open on the opposite side of the road to the monitoring site and locals would have continued to visit the bank and the Premier shop in Burry Port where the monitoring site is located. Notably, both roads are key access routes into their town centres, so it's possible that residents continued to travel by vehicles for their essential journeys. Even so, despite these increases, both these sites remain much lower than 30µg/m<sup>3</sup> and May 2020 results reduced even further.

Overall, there is again a reduction in measurements of NO<sub>2</sub> in comparison to the previous years and all 'Other' sites measured below 40µg/m<sup>3</sup> between February to June 2020. Whilst changes in weather conditions have played a significant part in the February 2020 drop, benefits from changes in activity are not as noticeable in the quieter towns of Burry Port and Ammanford compared to the towns with AQMA's. All sites in May 2020 observed lower results than April, and all sites have increased in June.

## Conclusions

There are many factors that can contribute to improvements in NO<sub>2</sub> levels, generally we are noticing a small improvement year on year as vehicles become cleaner, although this is not always so noticeable when more vehicles are on the road. This may explain why measurements in some areas started higher this year compared to previous years.

As mentioned in the introduction, weather can complicate the patterns that we are seeing, February 2020 was the windiest month since 1980 which would help disperse pollutants more easily. We can clearly observe this for all sites and the busier sites which generally measure higher levels of NO<sub>2</sub> seem to benefit more significantly from stronger winds than sites with less traffic. The sites experiencing the canyon effect with rows of terraced houses either side, also observe decreases of NO<sub>2</sub> with the wind, however they don't appear to achieve as much of a reduction than the more open sites, as pollutants can remain somewhat trapped.

Spring 2020 has also been the sunniest since records began. Increased sunshine can reduce the levels of NO<sub>2</sub>, it causes a chemical reaction with NO<sub>2</sub>, separating one of the oxygen atoms which then adds to naturally occurring oxygen molecules (O<sub>2</sub>) in the air to create Ozone (O<sub>3</sub>). Across the UK we have observed an improvement in Air Quality regarding certain pollutants such as NO<sub>2</sub>, however there has been a significant increase in Ozone which has harmful effects to vegetation and health. Ozone can irritate the lungs and cause symptoms of asthma and lung disease to worsen.

It is however clear that we have measured significant lower levels of NO<sub>2</sub> during the April and May 2020 across Carmarthenshire's AQMA's, and for the first time in over 7 years all monitoring sites measured a monthly reading below 40µg/m<sup>3</sup>. This outcome has tremendous significance for the monitoring sites at 85 Priory Road, Carmarthen and 13 Felinfoel Road, Llanelli which have continued to measure the highest readings in those towns. Unfortunately, June 2020 measurements had already started to see levels increase in most areas with lockdown restrictions started to ease. Non-essential shops opened on 22<sup>nd</sup> June and schools reopened on 29<sup>th</sup> June. The results indicate that much more work will be needed to address the high levels seen in Felinfoel Road, Llanelli and Priory Street, Carmarthen to maintain much lower monthly readings.

Although Llandeilo has continued to see measurements below 40µg/m<sup>3</sup> during June 2020, levels are increasing with returning traffic and there is a risk it will continue to rise as further lockdown restrictions are removed. As a main trunk road from Swansea to Chester, the A483 through Llandeilo suffers from a large proportion of through traffic that are not visiting the town, it is clear from these results how much residents and shoppers would benefit from reduced numbers of vehicles travelling through this area.

The smallest changes have occurred in the more rural of areas or less busy urban areas where NO<sub>2</sub> levels are usually much lower than the Air Quality Objective. They will continue to experience background levels of Nitrogen Dioxide and with less pollution in general, will subsequently not benefit as greatly from the lockdown as the busier towns, particularly where traffic numbers were not so high in the first place. None the less it is Welsh Government's policy to improve air quality wherever possible, so even small gains are beneficial.

## Recommendations

The findings of this report demonstrate how much we can improve air quality in our AQMA's and throughout the County from reducing non-essential journeys and clearly illustrates how much of the NO<sub>2</sub> emanates from traffic sources. It is therefore important that we do something to ensure that we don't just fall back into our old ways and help deliver Welsh Government's policy in making improvements to Air Quality wherever possible.

Work will continue to deliver this through the development process and further work is being made in key towns and villages to improve cycling routes and footways, building on electric vehicle charging points in addition to progressing further actions outlined within the AQMA Action plans for Llanelli, Carmarthen and Llandeilo collaboratively with our partners.

There are several council buildings located within our Air Quality Management Areas, so it is important that we reflect on our own contribution towards local air quality and make our own improvements where possible. It is recommended that the Council makes a commitment to expand on current policies relating to home working and agile working so not to encourage non-essential journeys when the work can be done effectively either at home or at a closer more convenient office base.

We have also seen incredible benefits from increased use of Microsoft Teams or Skype Meetings, teleconferencing and webinars to administer training, not only reducing travel and pollution, but also preventing lost time from travelling and subsequently resulting in increased productivity and reduced mileage costs. It is recommended that use of non-travel related techniques is considered the preferable first option under 'new normal' arrangements, and at the very least incorporating a digital option, to save all invitees needing to travel unnecessarily.

Air pollution is a cause of underlying health conditions that can make people more susceptible to severe health outcomes of COVID-19. The COVID-19 lockdown has enabled us to think about how we travel, whether we need to use our vehicles and how we can do things differently. Across the UK the public have also recognised the benefits of fewer vehicles on the road and many have embraced new low pollution behaviours such as walking, cycling and working from home. Cleaner air is considered more important than ever so this is an opportune time to welcome this willingness to change, reflect on what we have learned and act to support improvements to improve our local air quality.