AQM
AIR QUALITY MONITORS

Particulate Matter Monitoring
St. Stephen-in-Brannel, Treviscoe, Nanpean and St Dennis

March – May 2017

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Project Reference	AQM28062017
Issue Date	June 2017
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1.0 Introduction

1.1 Introduction

Air Quality Monitors Ltd was initially commissioned by St. Stephen-in-Brannel Parish Council to review and analyse continuous PM_{10} monitoring data from the air quality particulate monitor in the village of St. Stephen-in Brannel.

The purpose of the analysis was to establish baseline PM_{10} air quality data in the St. Stephen area prior to the commissioning of the Energy from Waste (EfW) plant at Rostowrack Farm in St Dennis. The Parish Council intended to continue monitoring, following the commissioning of the EfW plant, in order that a comparison of the baseline conditions could be made to the operating conditions.

The monitoring site in St. Stephen-in Brannel is located approximately four kilometres to the south of the EfW plant and although neither site is within an Air Quality Management Area (AQMA), they both lie within an area that has a significant china clay industry. A two-year study undertaken by the China Clay Area Dust Monitoring Forum[1] from 2003 – 2005, indicated that the china clay industry increased ambient concentrations of PM_{10} levels by as much as 8 $\mu g/m^3$ as a daily average, depending on location and weather conditions.

St-Stephen-in-Brannel Parish Council have purchased three further AQM DM11 PM_{10} monitors that are located in the villages of Treviscoe, Nanpean and St Dennis. The monitors in Treviscoe and Nanpean were installed during the summer of 2016 and valid data is available from the end of August 2016. The monitor in St Dennis was installed on the 12th October 2016.

Monitoring data from the AQM DM11 PM_{10} monitor can only be used for screening assessments to identify where there is a potential for an air quality objective to be exceeded. This is due to differences in the monitoring technique and in order to determine whether an exceedance of the National Air Quality Strategy (NAQS) Air Quality Objectives has occurred, gravimetric monitoring would be required. However, the AQM DM11 is a very useful tool and provides indicative or semi quantitative results.

This report forms part of an on-going series and provides:

- The results and analysis of the PM_{10} monitoring from 1st March to 31st May 2017 for the monitoring sites in St Stephen-in-Brannel, Treviscoe, Nanpean and St Dennis.
- Comparison of data from the four DM11s against the PM_{10} air quality objectives.

A glossary of common air quality terminology is provided in **Appendix A**.

1.2 Sources of PM_{10} Particles

The term PM_{10} refers to particulate matter with a diameter of approximately 10 µm or less and represents the respirable fraction of dust. Particles of this size are not filtered out by the nose and throat and can settle deep in the lungs causing health problems.

1 The China Clay Dust Monitoring Forum (March 2007). An investigation into of the China Clay Industry's Impact on PM_{10} in Cornwall.

The health effects of particle pollution have been widely studied, and include premature death, worsening of lung and heart disease, often increasing admissions to hospital. [2]

PM_{10s} are made up of a wide range of materials and arise from a variety of sources, both man-made and natural. It is generally accepted that PM_{10} concentrations fall into two main categories:

- Primary particles include mobile sources i.e. road transport and stationary sources such as the burning of fuels for industrial, commercial and domestic purposes. Emissions of dust can also generate high concentrations of PM_{10} close to quarries and construction sites. Natural sources include sea spray and dust from the Saharan desert travelling vast distances.

- Secondary particulate matter is formed from chemical reactions of the gases ammonia (NH_3), sulphur dioxide (SO_2) and nitrogen oxides (NO_x) in the atmosphere to form ammonium sulphates and ammonium nitrates. NH_3 is emitted mainly from agricultural sources, particularly livestock waste. SO_2 is formed by combustion of sulphur containing fuels such as coal. NO_x is formed by combustion of fuels used in power generation, domestic heating and traffic. Secondary particulate matter is also formed from organic compounds by reactions that occur in the atmosphere.

2 World Health Organization (2013). Review of evidence on health aspects of air pollution REVIHAAP Project.
Air Quality Expert Group (2005). Particulate Matter in the UK: Summary. Defra, London.
Royal College of Physicians & Royal College of Paediatrics and Child Health (2016). Every Breath we take. The lifelong Impact of Air Pollution. London.

2.0 Policy Context

2.1 International Legislation and Policy

The EU Directive 2008/50/EC[3] on ambient air quality and cleaner air for Europe (the CAFE directive) sets out a series of limit values for the protection of human health and critical levels for the protection of vegetation. Compliance with the EU Limit Values is mandatory for all EU members and the UK may incur infringement action if it does not meet the required objective limits within the agreed time limits. The UK is currently exceeding the objective limits for NO_2 and PM_{10} within London and a number of other areas within the UK. The Air Quality Standards Regulations 2010[4] implements the requirements of the Directive into UK legislation.

2.2 National Legislation and the UK Air Quality Strategy

The National Air Quality Strategy (NAQS) for England, Scotland, Wales and Northern Ireland[5] published in July 2007, is part of the Government's overall strategy to improve the quality of life for people in the UK. The NAQS contains policies for the assessment of UK air quality and implementation of European Union and International agreements. The NAQS sets out air quality objectives and dates for achievement for nine airborne pollutants, which are designed to protect human health and the environment.

The National Air Quality Objectives (NAQOs) apply to external air where there is relevant exposure to the public over the associated averaging periods within each objective. Guidance is provided within Local Air Quality Management Technical Guidance 2016 (LAQM.TG (16))[6] issued by DEFRA for Local Authorities on where the NAQOs apply, as detailed in **Table 2.1**. The objectives do not apply in workplace locations, to internal air or where people are unlikely to be regularly exposed (i.e. centre of roadways).

It should be noted that the EU Limit Values are numerically the same as the NAQO values but differ in terms of compliance dates. The compliance date for the PM_{10} Limit Values is 1st January 2005. The EU Limit Values are also mandatory, whereas the NAQOs are policy objectives. Local authorities are not required to achieve them, but to work towards their achievement.

The strategy also sets out the roles that Government, industry, the Environment Agency, local government, business, individuals and transport have in protecting and improving air quality.

2.3 Local Air Quality Management

Local authorities are seen to play a particularly important role in local air quality management. Section 82 of the Environment Act 1995 requires every local authority to conduct a review of the air quality from time to time within the authority's area. The recently released DEFFA technical guidance, LAQM.TG(16), describes a new streamlined approach to the Local Air Quality Management (LAQM) regime, whereby every authority has to undertake and submit a single Annual Status Report/Annual Progress Report within its area, to identify whether the objectives have been or will be achieved at relevant locations by the applicable date. If the objectives are not being met, the authority must declare an Air Quality Management Area (section 83 of the Act) and prepare an

[3] Directive 2008/50/EC of the European Parliament and of the Council of 21 May 2008 on ambient air quality and cleaner air for Europe

[4] Air Quality Regulations 2010 – Statutory Instrument 2010 No. 1001

[5] Defra (2007). The Air Quality Strategy for England, Scotland, Wales and Northern Ireland.

[6] DEFRA (2016) Local Air Quality Management. Technical Guidance LAQM.TG(16)

action plan (section 84) which identifies measures that will be introduced in pursuit of the objectives.

Table 2.1: Locations Where Air Quality Objectives Apply		
Averaging Period	**Objectives should apply at:**	**Objectives should generally not apply at:**
Annual Mean	All locations where members of the public might be regularly exposed. Building façades of residential properties, schools, hospitals, care homes etc.	Building façades of offices or other places of work where members of the public do not have regular access. Hotels, unless people live there as their permanent residence Gardens of residential properties. Kerbside sites (as opposed to locations at the building facade), or any other location where public exposure is expected to be short term.
24 Hour Mean	All locations where the annual mean objective would apply together with hotels. Gardens of residential properties.	Kerbside sites (as opposed to locations at the building façade), or any other location where public exposure is expected to be short term.

2.4 Assessment Criteria

To protect our health, the Government has set air quality standards and objectives for PM_{10}. The air quality standards are concentrations below which risks to public health are considered unlikely or exceedingly small. They are based on scientific and medical evidence reviewed by the Expert Panel on Air Quality Standards (EPAQS) and the World Health Organisation (WHO).

The objective is the target date on which exceedences of a standard are expected to be achieved by the Government. They take account of economic efficiency, practicability, technical feasibility and timescale. There are two air quality objectives for PM_{10}:

- The 24-hour (daily) mean objective, which is the concentration of PM_{10} in the air averaged over 24 hours, is designed to ensure that the public are not exposed to high concentrations of PM_{10} for short periods. This objective applies at building façades and gardens of residential properties, schools, hospitals, care homes and hotels;

- The annual objective, which is the concentration of PM_{10} in the air averaged over one year, aims to protect the public from PM_{10} over a long-time period. This objective applies at all locations detailed above except gardens and hotels, unless people live there as their permanent address.

The relevant assessment criteria for this report are provided in **Table 2.2**.

Table 2.2: Relevant Objectives set out in the Air Quality Strategy			
Pollutant	**Concentrations**	**Measured As**	**Date to be Achieved By**
Particulate Matter PM_{10}	50 μgm^{-3} not to be exceeded more than 35 times per year	24-hour mean	31.12.2004
	40 μgm^{-3}	Annual mean	31.12.2004

For the 24-hour (daily) mean objective, an agreed number of exceedences are permitted. This allows for events such as Bonfire Night, where it is not possible or practicable to expect 24-hourly mean concentrations to remain within the agreed limit.

3.0 Assessment Methodology

3.1 Monitoring Technique

Continuous monitoring of particles can be undertaken using many different types of monitor. For this study four AQM DM11 airborne particulate monitors supplied by Air Quality Monitors were used. The real time AQM DM11 monitors measure PM_{10} using a light scattering technique, similar to the Turnkey Osiris monitor. Light scattering instruments work on the principle that there is a relationship between the scattering of light that reaches the particle and particle size. A pump continuously draws an air sample through a nephelometer which sizes the individual particles as they pass through a beam. The particles are then collected on a filter to allow further analysis if necessary. The data is accessed remotely via a modem allowing it to be downloaded at frequent intervals.

The AQM DM11 monitors are serviced on an annual basis by Air Quality Monitors. The instrument was also granted Mcerts approval in February 2014. Light scattering instruments are ideal for screening surveys and provide indicative or semi quantitative results.

Wind data was supplied by the anemometers attached to the AQM DM11's at the monitoring sites located in St Stephen-in-Brannel, Treviscoe, Nanpean and St Dennis.

3.2 Monitoring Locations

St. Stephen-in-Brannel is a small village in mid Cornwall and lies approximately 9 km west of St Austell on the southern edge of Cornwall's china clay industry. The EfW site is located approximately 4 km to the north of the village. The AQM DM11 monitor is located on the roof of the Saint Stephen-in Brannel Parish Council Building.

Treviscoe lies approximately 1km to the southwest of the EfW site. The monitor is located within the grounds of Nuco Training Ltd offices in Central Treviscoe.

Nanpean is a small village on the B3279 road, approximately 6.5 km northwest of St Austell in the heart of the china clay industry in mid Cornwall. The monitor lies approximately 2.2 km to the southeast of the EfW site and is located within the cemetery of St Georges Mission Church in Nanpean.

St Dennis is a civil parish and village in Cornwall situated on the B3279 between Newquay and St Austell. The monitor lies approximately 1km northeast of the EfW site and is located within St Dennis Cemetery off Hall Road.

The position of the monitoring locations in relation to the EfW site are presented in **Figure 3.1**.

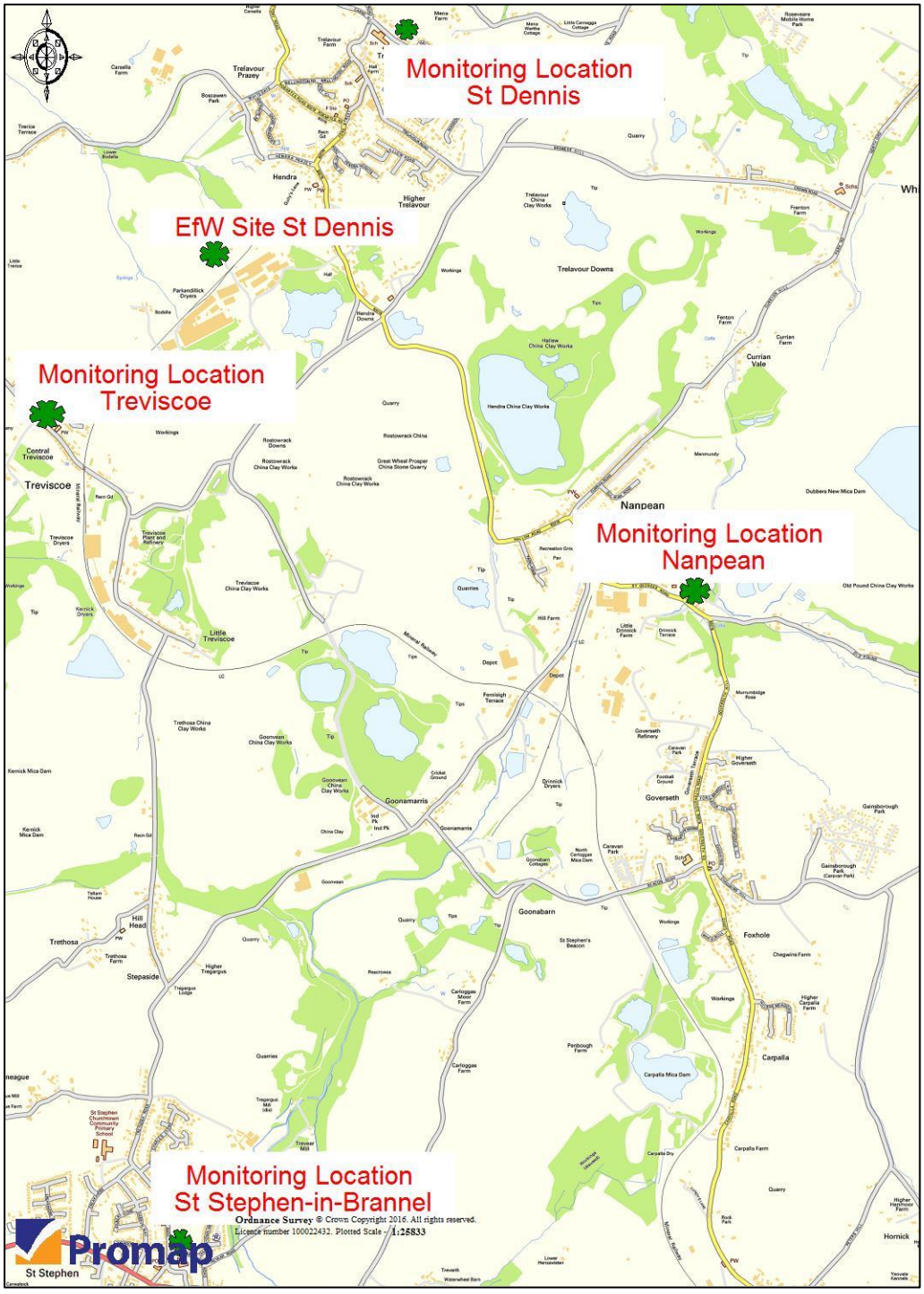


Figure 3.1: Monitoring Locations

4.0 Monitoring Results

4.1 St Stephen-in- Brannel Monitoring Site

Results for Period 1st March 2017 to 31st May 2017

A summary of the results for the monitoring period 1st March to 31st May 2017 are presented in **Table 4.1**.

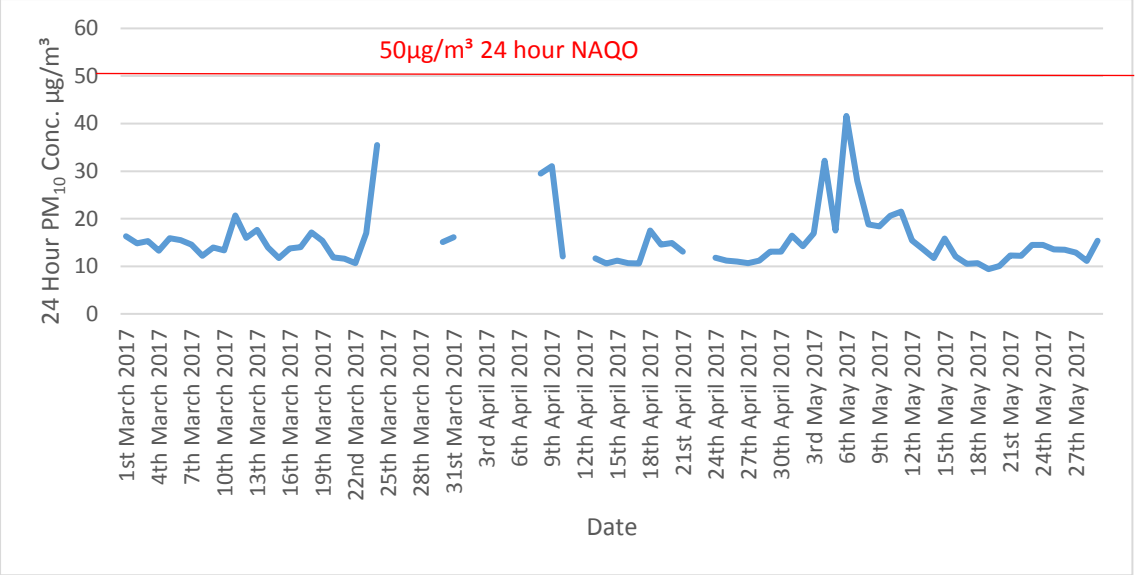
The 24-hour (daily) mean concentrations are presented in **Appendix B** in tabular format.

Table 4.1: Summary of Monitoring Results for Period 1st March to 31st May 2017 St Stephen-in-Brannel

Statistic	St. Stephen Parish Council Offices
Monitoring Period	1st March to 31st May 2017
No. of Days	92
Data Capture (%)	84.1
Period Mean PM_{10} Concentration ($\mu g/m^3$)	15.5
Maximum 15- Min Mean PM_{10} Concentration ($\mu g/m^3$)	386.7
No of Days > 50 $\mu g/m^3$ (35 allowed a year)	0
Maximum 24-Hour Mean PM_{10} Concentration ($\mu g/m^3$)	41.6

The PM_{10} mean for the three-month monitoring period was 15.5$\mu g/m^3$ (**Table 4.1**) which is well below the NAQS annual mean objective of 40 $\mu g/m^3$. The results also indicate no exceedences of the 24-hour (daily) mean objective for PM_{10} during the three months of monitoring. The maximum recorded 24 hour (daily) PM_{10} concentration was 41.6$\mu g/m^3$, recorded on the 6th May 2017 (**Graph 1**). Data capture for the monitoring period was 84.1%. A data capture rate of 85% for ratified data is specified in the relevant DEFRA Technical Guidance and is recommended as a target for PM_{10} monitoring[7].

7 DEFRA Local Air Quality Management Technical Guidance 2016 LAQM.TG (16)



Graph 1: Daily Mean PM_{10} Concentrations 1st March to 31st May 2017 St Stephen-in-Brannel

4.2 Treviscoe Monitoring Site

Results for Period 1st March 2017 to 31st May 2017

A summary of the results for the monitoring period 1st March to 31st May 2017 are presented in **Table 4.2**.

The 24-hour (daily) mean concentrations are presented in **Appendix B** in tabular format.

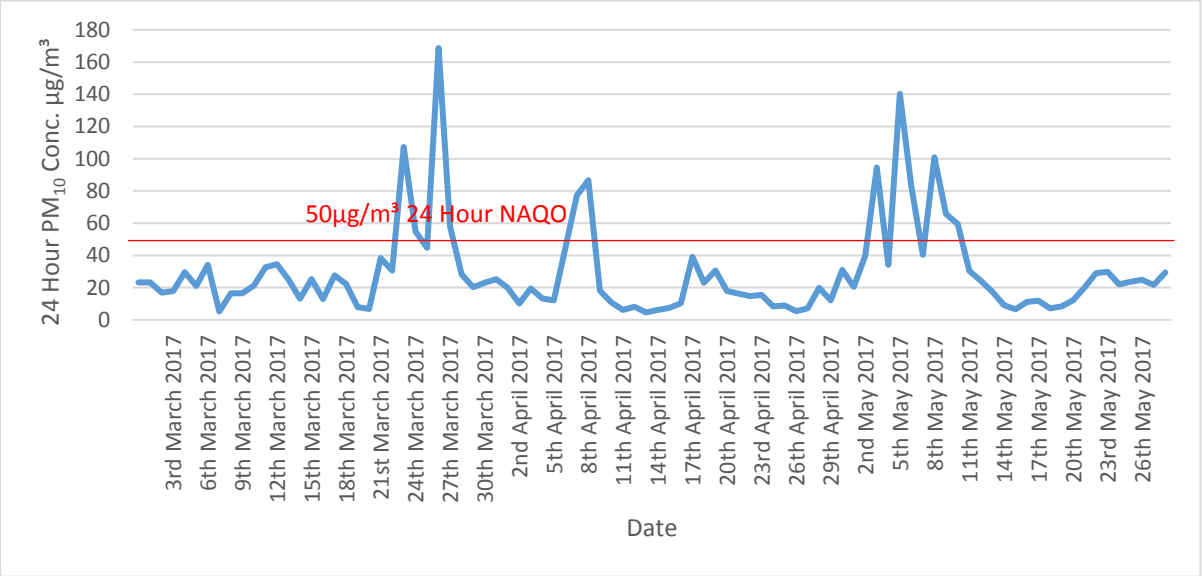
Table 4.2: Summary of Monitoring Results for Period 1st March to 31st May 2017 Treviscoe

Statistic	Treviscoe
Monitoring Period	1st March to 31st May 2017
No. of Days	92
Data Capture (%)	93.8
Period Mean PM_{10} Concentration (µg/m³)	28.9
Maximum 15- Min Mean PM_{10} Concentration (µg/m³)	572.5
No of Days > 50 µg/m³ (35 allowed a year)	12
Maximum 24-Hour Mean PM_{10} Concentration (µg/m³)	168.7

The PM_{10} mean for the three-month monitoring period was 28.9µg/m³ (**Table 4.2**) which is below the NAQS annual mean objective of 40 µg/m³. The results also indicate that there were twelve exceedences of the 24-hour (daily) mean PM_{10} objective during the monitoring period out of a permitted 35 exceedences. These exceedences occurred on the following days:

- 24th, 25th, 27th and 28th March 2017;
- 8th, and 9th April 2017; and
- 4th, 6th, 7th, 9th, 10th, and 11th May 2017.

The maximum recorded daily PM_{10} concentration was 168.7µg/m^3 recorded on the 27th March 2017 (**Graph 2**). Data capture for the monitoring period was good at over 93.8%.



Graph 2: Daily Mean PM_{10} Concentrations 1st March to 31st May 2017 Treviscoe

The diurnal profile for the 27th March 2017, which indicates the highest 24-hour (daily) PM_{10} concentration of 168.7µg/m^3 is presented in **Graph 6**.

On the 9th May 2017, an anemometer was attached to the monitoring station providing local wind speed and direction data.

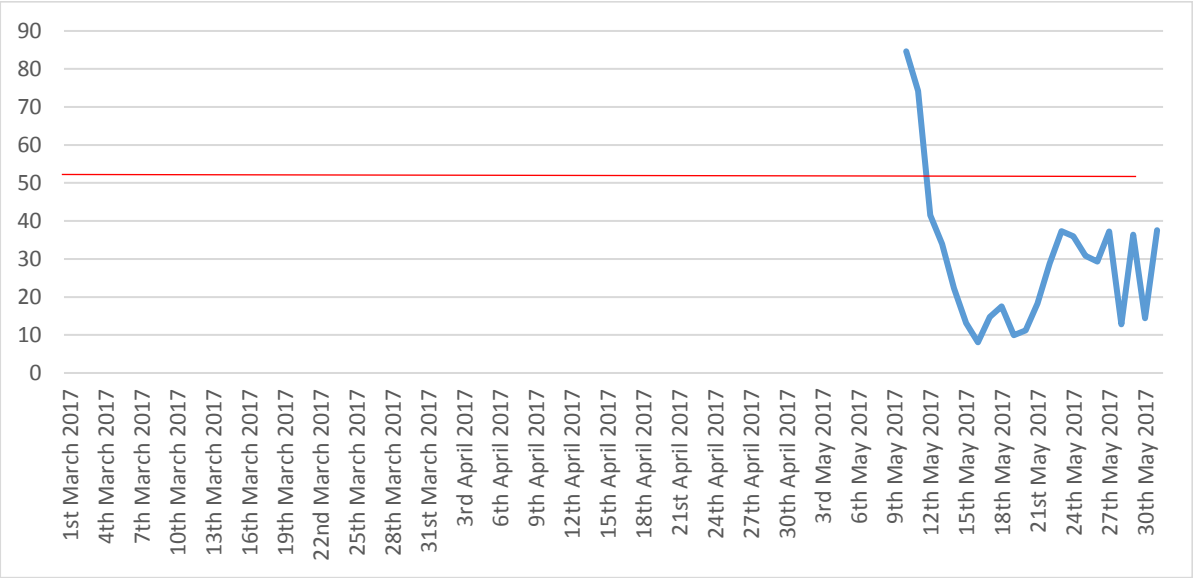
4.3 Nanpean Monitoring Site

A summary of the results for the monitoring period 1st March to 31st May 2017 are presented in **Table 4.3**. The 24-hour (daily) mean concentrations are presented in **Appendix B** in tabular format.

Table 4.3: Summary of Monitoring Results for Period 1st March to 31st May 2017 Nanpean	
Statistic	**Nanpean**
Monitoring Period	1st March to 31st May 2017
No. of Days	92
Data Capture (%)	23.7
Period Mean PM_{10} Concentration (µg/m^3)	29.1[a]
Maximum 15- Min Mean PM_{10} Concentration (µg/m^3)	150.2[a]
No of Days > 50 µg/m^3 (35 allowed a year)	2[a]
Maximum 24-Hour Mean PM_{10} Concentration (µg/m^3)	84.6[a]
[a] results should be treated with caution as very low data capture due to signal/communication problems	

The PM_{10} mean for the monitoring period was 29.1µg/m^3 which is below the NAQS annual mean objective of 40 µg/m^3. However, data capture for the monitoring period was very low therefore the results should be treated with caution especially when comparing the data to the air quality objectives. The results also indicate two exceedences of the 24-hour (daily) mean PM_{10} objective during the monitoring period out of a permitted 35 exceedences. These exceedences occurred on the following days:

- 10th and 11th May 2017.



Graph 3: Daily Mean PM_{10} Concentrations 1st March to 31st May 2017 Nanpean

The maximum recorded 24 hour (daily) PM_{10} concentration was 84.6µg/m^3 recorded on the 10th May 2017 (**Graph 3**). Data capture for the monitoring period was very low at 23.7%.

The diurnal profile for the 10th May 2017, which indicates the highest 24-hour (daily) PM_{10} concentration of 84.6 µg/m^3 is presented in **Graph 10**.

4.4 St Dennis Monitoring Site

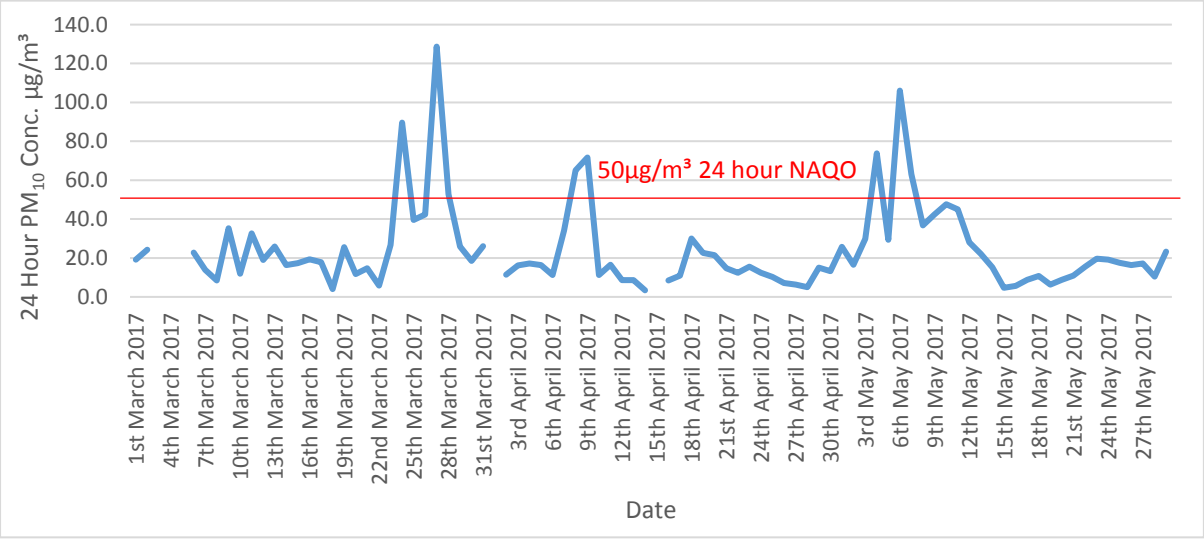
A summary of the results for the monitoring period 1st March to 31st May 2017 are presented in **Table 4.4**.

The daily (24-hourly) mean concentrations are presented in **Appendix B** in tabular format.

Table 4.4: Summary of Monitoring Results for Period 1st March to 31st May 2017 St Dennis	
Statistic	**St Dennis**
Monitoring Period	1st March to 31st May 2017
No. of Days	92
Data Capture (%)	92.8
Period Mean PM_{10} Concentration ($\mu g/m^3$)	23.8
Maximum 15- Min Mean PM_{10} Concentration ($\mu g/m^3$)	230.4
No of Days > 50 $\mu g/m^3$ (35 allowed a year)	8
Maximum 24-Hour Mean PM_{10} Concentration ($\mu g/m^3$)	128.7

The PM_{10} period mean for the monitoring period was 23.8$\mu g/m^3$ which is below the NAQS annual mean objective of 40 $\mu g/m^3$. There were eight recorded exceedences of the 24-hour (daily) mean objective for PM_{10} during the three months of monitoring (**Graph 4**). The exceedences occurred on the following days:

- 24th, 27th and 28th March 2017;
- 8th and 9th April 2017; and
- 4th, 6th, 7th and May 2017.



Graph 4: Daily Mean PM_{10} Concentrations 1st March to 31st 2017 St Dennis

The diurnal profile for the 27th March 2017, which indicates the highest 24-hour (daily) mean PM_{10} concentration of 128.7 $\mu g/m^3$ is presented in **Graph 6**. Data capture for the monitoring period was over 83%.

4.5 Diurnal Profiles for Exceedences at More than One Site

Throughout the monitoring period, exceedences of the 24-hour (daily) PM_{10} objective occurred at more than one monitoring site on a number of days. These are detailed in **Table 4.5.**

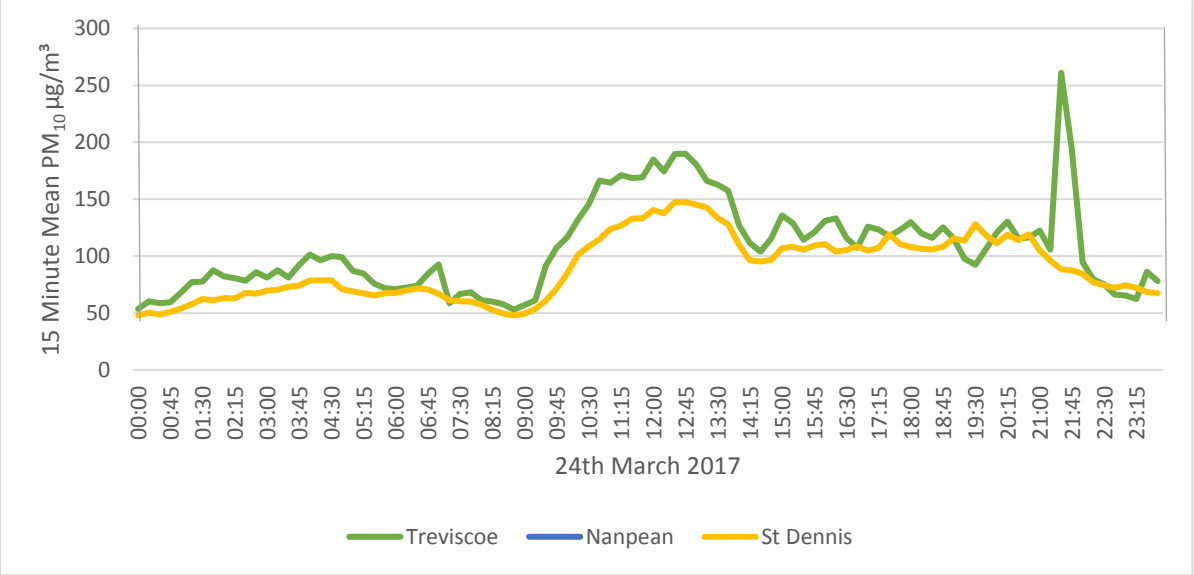
Table 4.5: Diurnal Profiles for Exceedances at More than one Site						
Date	**24 Hour (Daily) PM_{10} Concentration ($\mu g/m^3$)**			**Wind Direction Treviscoe**	**Wind Direction Nanpean**	**Wind Direction St Dennis**
	Treviscoe	**Nanpean**	**St Dennis**			
24th March 2017	107.3	No Data	89.7	No Data	No data	E
27th March 2017	168.7	No Data	128.7	No Data	No data	SSE
28th March 2017	57.9	No Data	52.8	No Data	No data	SSW
8th April 2017	77.3	No Data	65.0	No Data	No data	S
9th April 2017	86.7	No Data	71.7	No Data	No data	S/NW
4th May 2017	94.7	No Data	73.9	No Data	No data	E
6th May 2017	140.3	No Data	106.0	No Data	No data	E
7th May 2017	82.7	No Data	63.1	No Data	No data	E/NW
10th May 2017	65.8	84.6	-	NNE	-	E
11th May 2017	59.4	74.2	-	NNE	SE	SE/SW

The diurnal profiles for each of the days detailed in **Table 4.5** for the three monitoring sites of Treviscoe, Nanpean and St Dennis are presented in **Graphs 5 to 10** below**.**

24th March 2017

Graph 5 indicates that the 15-minute mean PM_{10} concentrations at the Treviscoe and Nanpean sites followed a similar trend throughout the day with a localised peak in concentrations at Treviscoe at approximately 19:30 hours on the 24th March 2017.

The wind direction (**Table 4.5**) recorded at St Dennis, was predominately from the east on the 24th March 2017. Areas most consistently affected by dust/PM_{10} are influenced by prevailing winds that are generally located downwind of an emissions source. Therefore, the highest risks would have occurred at receptors to west of the EfW site. The wind speed recorded at the St Dennis monitoring site on the Friday 24th March 2017 ranged from 1.2 to 7.3 m/s.

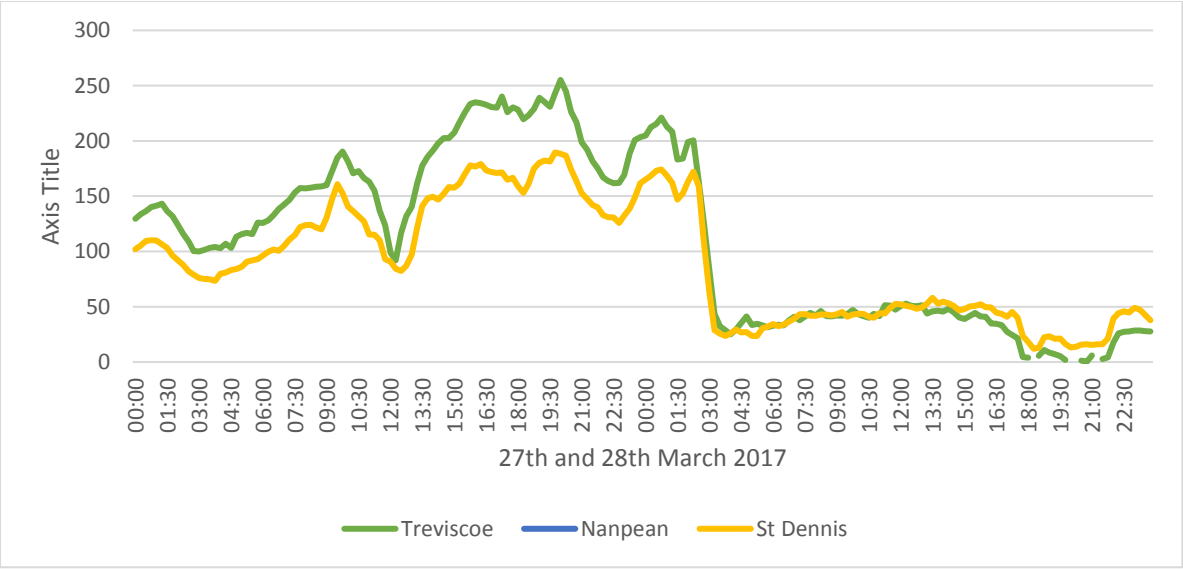


Graph 5: Diurnal PM_{10} Concentrations at Treviscoe and St Dennis – 24th March 2017

27th and 28th March 2017

On the 27th and 28th March 207, the diurnal profiles at the Treviscoe and St Dennis sites again followed a similar trend throughout the day. (**Graph 6**).

The prevailing wind direction was predominantly from the south southeast at St Dennis. The highest risks would have occurred to the north northwest of the EfW site, which is away from the villages of Treviscoe and St Dennis. The wind speed ranged from 0.7 to 4.6 m/s.

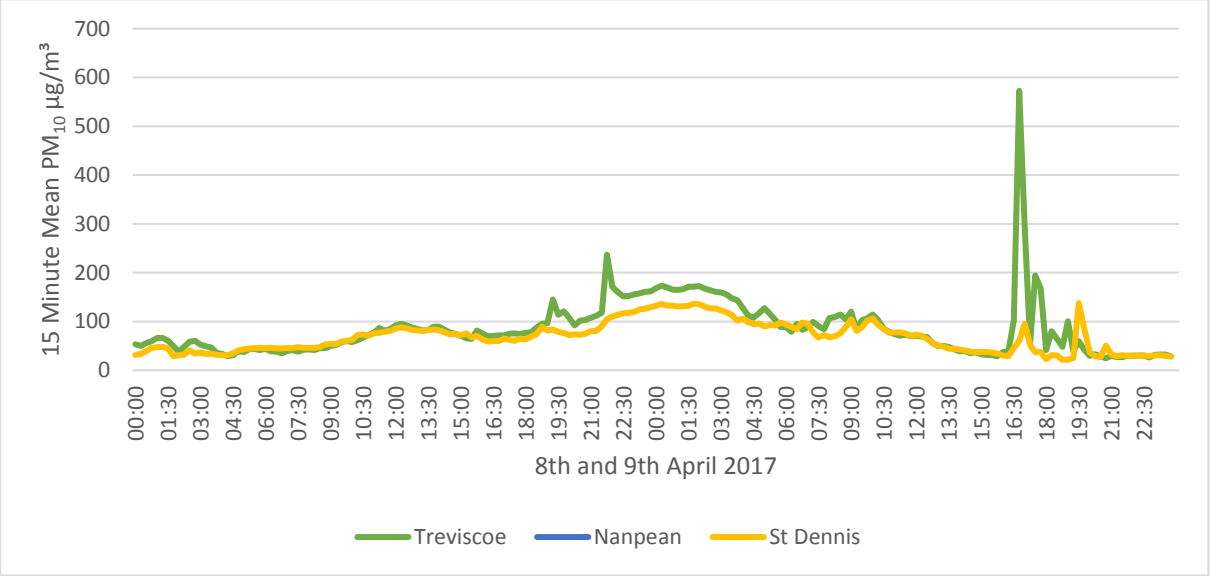


Graph 6: Diurnal PM_{10} Concentrations at Treviscoe and St Dennis – 27th & 28th March 2017

8th and 9th April 2017

The diurnal profiles for the 8th and 9th April 2017, at the Treviscoe and St Dennis monitoring sites are presented in **Graph 7.** The 15-minute mean PM_{10} concentrations again follow a similar trend over the two days, although a large peak is evident at Treviscoe at approximately 16:45 hours on the 9th

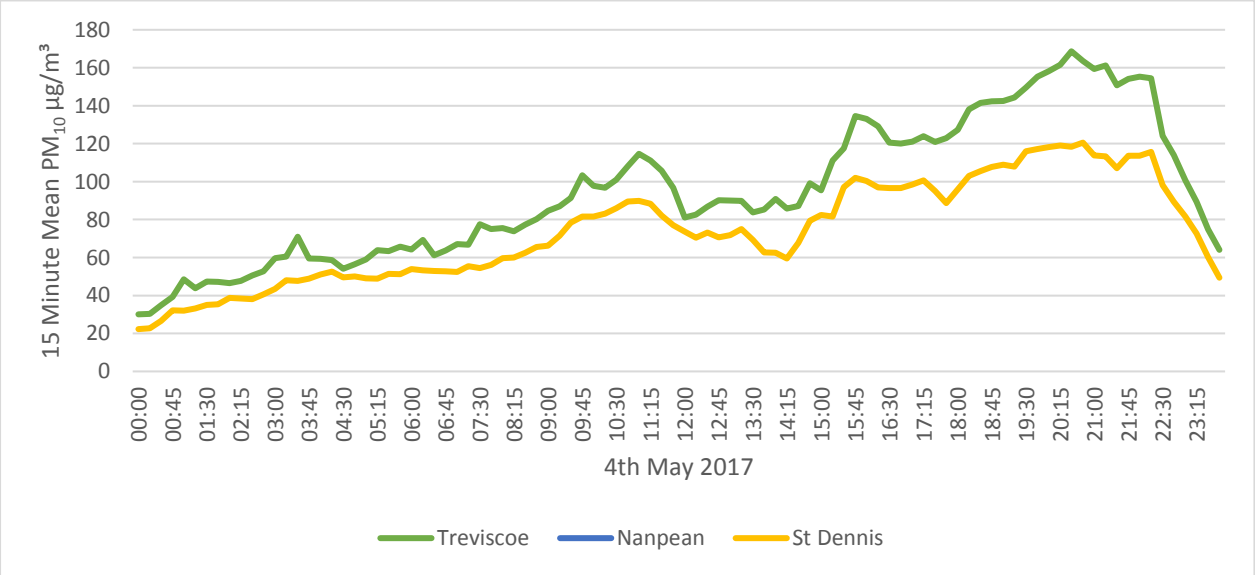
April 2017. The prevailing wind direction ranged from southerly to north westerly, therefore the highest risks would have occurred to the north of the EfW site on the 8th April 2017 and to the south east on the 9th April 2017. The wind speed ranged from 0.1 to 3.1m/s over the two days.



Graph 7: Diurnal PM_{10} Concentrations at Treviscoe and St Dennis –8th and 9th April 2017

4th May 2017

On the 4th May 2017, the 15-minute mean PM_{10} concentrations again follow a similar trend throughout the day (**Graph 8**). The prevailing wind direction was from the east; therefore, the highest risks would have occurred to the west of the EfW site. The wind speed ranged from 0.02 to 3.9 m/s during the day.

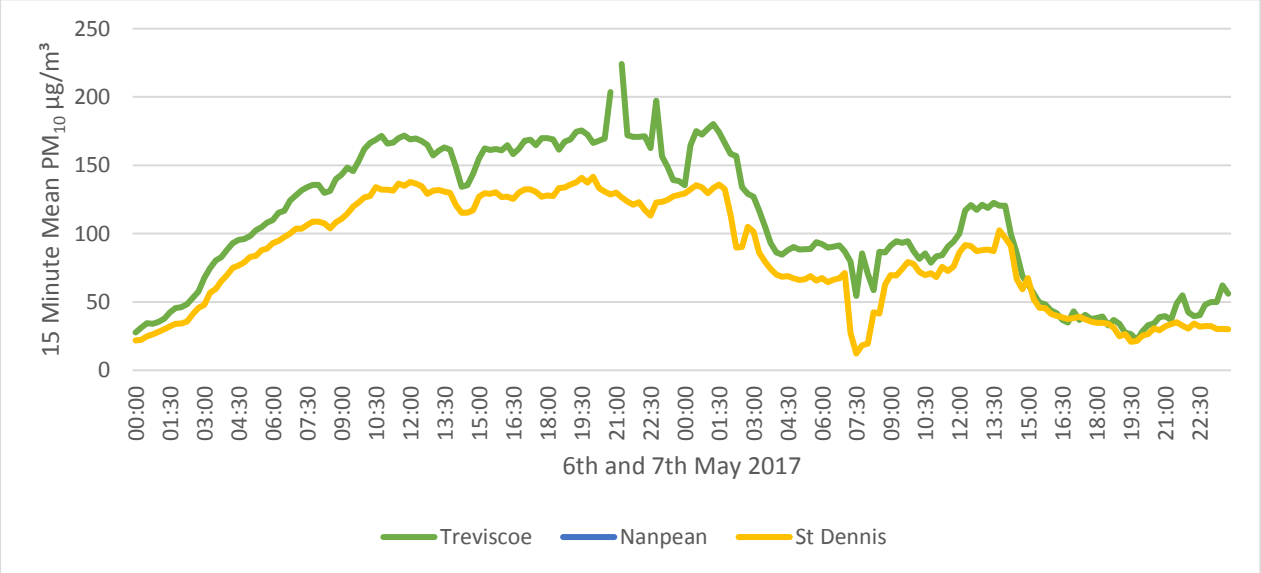


Graph 8: Diurnal PM_{10} Concentrations at Treviscoe and St Dennis –4th May 2017

6th and 7th May 2017

The diurnal profiles for the 6th and 7th May 2017 are presented in **Graph 9.** The 15-minute mean PM_{10} concentrations again follow a similar trend throughout the day with the highest concentrations

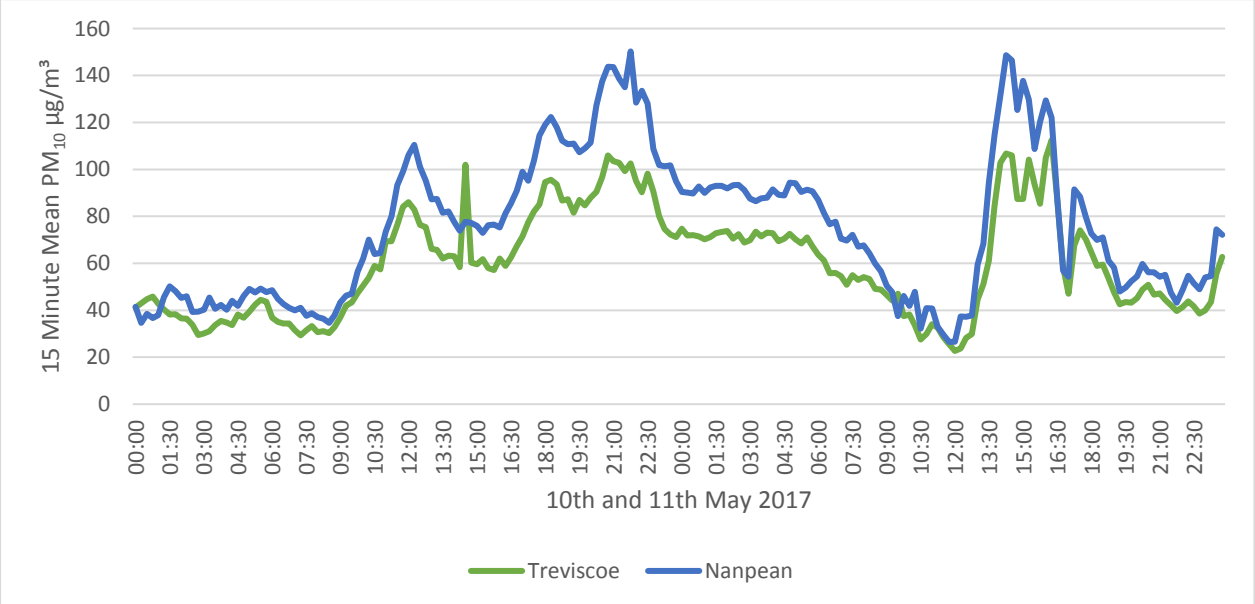
being experienced at the Treviscoe monitoring site. The prevailing wind direction ranged from easterly to north westerly over the two days, therefore the highest risks would have occurred to the west/south east of the EfW site.



Graph 9: Diurnal PM_{10} Concentrations at Treviscoe, Nanpean and St Dennis –6th and 7th May 2017

10th and 11th May 2017

The diurnal profiles for the 10th and 11th May 2017 are presented in **Graph 10.** The 15-minute mean PM_{10} concentrations again follow a similar trend over the two days with the highest concentrations being experienced at the Nanpean monitoring site. The prevailing wind direction at Nanpean was south easterly and at Treviscoe the wind direction was north northeasterly, therefore the highest risks would have occurred to the north west/south southwest of the EfW site.



Graph 10: Diurnal PM_{10} Concentrations at Treviscoe and Nanpean–10th and 11th May 201

5.0 Conclusions

Air Quality Monitors Ltd was commissioned by St. Stephen-in-Brannel Parish Council to review and analyse continuous PM_{10} monitoring data from the air quality particulate monitors in the villages of St. Stephen-in Brannel, Treviscoe, Nanpean and St Dennis.

St Stephen in Brannel Monitoring Site

The PM_{10} monitoring for the 1st March to the end of May 2017, indicated that the values did not exceed the NAQS annual mean objective at the monitoring site in St Stephen St Brannel. There were no recorded exceedences of the 24 hour NAQO of 50 µg/m³.

Treviscoe Monitoring Site

The PM_{10} monitoring from the 1st March to the end of May 2017 at the Treviscoe monitoring site, indicated that the values did not exceed the NAQS annual mean objective level of 40µg/m³, whist the 24-hour mean objective was exceeded twelve times. The NAQS objectives are based on monitoring for a full calendar year, and the number of permitted exceedences of the 50µg/m³ 24-hour (daily) PM_{10} objective is 35 over the year. To date the DM11 is indicating twenty-four exceedences of the 24-hour mean objective over the first five months of the year.

As discussed previously (section 1.1), the DM11 instruments only provide indicative results when compared against the annual PM_{10} or 24-hour (daily) objective as they are not accurate enough to meet the expanded uncertainty requirements of equivalent gravimetric instruments. This is predominantly due to the differences in the monitoring technique. However, they are extremely useful for screening monitoring.

Nanpean Monitoring Site

The PM_{10} monitoring from the 1st March to the end of May 2017 at the Nanpean monitoring site indicated that the values were below the NAQS annual mean objective level. However, the data capture was very low at 23.7% due to communication/downloading problems and the results should be treated with caution. The results also indicated two exceedences of the 24-hour (daily) mean PM_{10} objective during the monitoring period out of a permitted 35 exceedences.

St Dennis Monitoring Site

The PM_{10} monitoring from the 1st March to the end of May 2017 at the St Dennis monitoring station, indicated that the values did not exceed the NAQS annual mean objective, whist the 24-hour mean objective was exceeded eight out of a permitted 35 exceedences. To date the DM11 is indicating fourteen exceedences of the 24-hour mean objective over the first five months of the year.

According to the Cornwall Council website[8], CERC formerly started its operational phase on the 23rd March 2017, having completed its construction and testing phases.

The next quarterly report is due in September 2017.

8 Cornwall County Council https://www.cornwall.gov.uk/environment-and-planning/recycling-rubbish-and-waste/the-cornwall-energy-recovery-centre-cerc/

Appendix A - Air Quality Terminology

Term	Definition
Air quality objective	Policy target generally expressed as a maximum ambient concentration to be achieved, either without exception or with a permitted number of exceedences within a specific timescale (see also air quality standard).
Air quality standard	The concentrations of pollutants in the atmosphere which can broadly be taken to achieve a certain level of environmental quality. The standards are based on the assessment of the effects of each pollutant on human health including the effects on sensitive sub groups (see also air quality objective).
Ambient air	Outdoor air in the troposphere, excluding workplace air.
Annual mean	The average (mean) of the concentrations measured for each pollutant for one year. Usually this is for a calendar year, but some species are reported for the period April to March, known as a pollution year. This period avoids splitting winter season between 2 years, which is useful for pollutants that have higher concentrations during the winter months.
AQMA	Air Quality Management Area.
DEFRA	Department for Environment, Food and Rural Affairs.
EPAQS	Expert Panel on Air Quality Standards
Exceedence	A period of time where the concentrations of a pollutant is greater than, or equal to, the appropriate air quality standard.
Fugitive emissions	Emissions arising from the passage of vehicles that do not arise from the exhaust system.
LAQM	Local Air Quality Management.
MCERTS	This is the Environment Agency of England and Wales (EA) Monitoring Certification Scheme. Compliance with MCERTS gives the EA confidence in the monitoring of emissions to the environment.
PM_{10}	Particulate matter with an aerodynamic diameter of less than 10 micrometres.
WHO	World Health Organisation
μgm^{-3} micrograms per cubic metre	A measure of concentration in terms of mass per unit volume. A concentration of 1ug/m^3 means that one cubic metre of air contains one microgram (millionth of a gram) of pollutant.

Appendix B –PM_{10} Monitoring Results

DM11 Results

Appendix A: 24-Hour (Daily) Mean µg/m³					
Date	**Day of Week**	**Location 1 (St Stephen in Brannel)**	**Location 2 (Treviscoe)**	**Location 3 (Nanpean)**	**Location 4 (St Dennis)**
1st March 2017	Wednesday	16.3	23.4		19.2
2nd March 2017	Thursday	14.9	23.2		24.3
3rd March 2017	Friday	15.3	16.8		
4th March 2017	Saturday	13.3	18.0		
5th March 2017	Sunday	15.9	29.6		
6th March 2017	Monday	15.5	21.1		22.8
7th March 2017	Tuesday	14.6	34.2		14.0
8th March 2017	Wednesday	12.2			8.4
9th March 2017	Thursday	14.0	16.6		16.8
10th March 2017	Friday	13.4	16.5		12.0
11th March 2017	Saturday	20.7	21.3		32.7
12th March 2017	Sunday	16.0	32.6		19.0
13th March 2017	Monday	17.6	34.6		25.9
14th March 2017	Tuesday	13.9	25.0		16.4
15th March 2017	Wednesday	11.8	13.2		17.4
16th March 2017	Thursday	13.8	25.2		19.3
17th March 2017	Friday	14.1	12.9		17.8
18th March 2017	Saturday	17.2			4.0
19th March 2017	Sunday	15.3	22.3		25.6
20th March 2017	Monday	11.9	8.0		11.8
21st March 2017	Tuesday	11.6			14.7
22nd March 2017	Wednesday	10.7			5.8
23rd March 2017	Thursday	17.0	30.6		26.8
24th March 2017	Friday	35.5	107.3		89.7
25th March 2017	Saturday		54.9		39.5
26th March 2017	Sunday		44.8		42.2
27th March 2017	Monday		168.7		128.7
28th March 2017	Tuesday		57.9		52.8
29th March 2017	Wednesday		28.3		26.0
30th March 2017	Thursday	15.1	20.4		18.6
31st March 2017	Friday	16.1	23.2		26.1
1st April 2017	Saturday		25.2		
2nd April 2017	Sunday		19.9		11.4
3rd April 2017	Monday		10.2		16.2
4th April 2017	Tuesday		19.5		17.2
5th April 2017	Wednesday		13.4		16.3
6th April 2017	Thursday		12.2		11.3
7th April 2017	Friday		44.5		34.1
8th April 2017	Saturday	29.5	77.3		65.0

9th April 2017	Sunday	31.0	86.7		71.7
10th April 2017	Monday	12.1	18.2		11.3
11th April 2017	Tuesday		10.8		16.5
12th April 2017	Wednesday		6.3		8.7
13th April 2017	Thursday	11.7	8.3		8.6
14th April 2017	Friday	10.6			3.4
15th April 2017	Saturday	11.2	6.1		
16th April 2017	Sunday	10.7	7.4		8.5
17th April 2017	Monday	10.6	10.3		10.9
18th April 2017	Tuesday	17.5	39.1		30.0
19th April 2017	Wednesday	14.6	23.0		22.6
20th April 2017	Thursday	14.9	30.6		21.4
21st April 2017	Friday	13.1	17.8		14.8
22nd April 2017	Saturday		16.4		12.4
23rd April 2017	Sunday		14.8		15.5
24th April 2017	Monday	11.8	15.5		12.4
25th April 2017	Tuesday	11.2	8.5		10.3
26th April 2017	Wednesday	11.0	8.9		7.2
27th April 2017	Thursday	10.7	5.5		6.4
28th April 2017	Friday	11.2	7.1		5.0
29th April 2017	Saturday	13.1	20.0		15.1
30th April 2017	Sunday	13.1	12.2		13.3
1st May 2017	Monday	16.4	31.1		25.7
2nd May 2017	Tuesday	14.2	20.5		16.5
3rd May 2017	Wednesday	16.9	39.9		29.8
4th May 2017	Thursday	32.2	94.7		73.9
5th May 2017	Friday	17.5	34.1		29.3
6th May 2017	Saturday	41.6	140.3		106.0
7th May 2017	Sunday	27.9	82.7		63.1
8th May 2017	Monday	18.8	40.3		36.7
9th May 2017	Tuesday	18.4	100.9		36.6
10th May 2017	Wednesday	20.6	65.8	84.6	47.7
11th May 2017	Thursday	21.5	59.4	74.2	45.0
12th May 2017	Friday	15.5	30.4	41.5	28.0
13th May 2017	Saturday	13.6	24.3	34.0	22.1
14th May 2017	Sunday	11.7	17.4	22.4	15.2
15th May 2017	Monday	15.8	9.1	13.1	4.7
16th May 2017	Tuesday	12.1	6.6	8.1	5.6
17th May 2017	Wednesday	10.5	11.2	14.7	8.9
18th May 2017	Thursday	10.7	11.9	17.5	10.8
19th May 2017	Friday	9.4	7.1	9.9	6.3
20th May 2017	Saturday	10.1	8.3	11.2	8.8
21st May 2017	Sunday	12.3	12.1	18.3	11.0
22nd May 2017	Monday	12.2	20.1	28.8	15.6
23rd May 2017	Tuesday	14.5	29.1	37.3	19.6
24th May 2017	Wednesday	14.5	29.8	35.9	19.2
25th May 2017	Thursday	13.5	22.0	30.8	17.6
26th May 2017	Friday	13.5	23.7	29.3	16.4
27th May 2017	Saturday	12.9	24.8	37.2	17.1
28th May 2017	Sunday	11.1	21.6	12.8	10.4

29th May 2017	Monday	15.3	29.5	36.4	23.3
30th May 2017	Tuesday	10.7	12.0	14.4	11.8
31st May 2017	Wednesday	14.6	29.9	37.5	19.7
Number in red indicates exceedence of the 24-hour (daily) mean					