DEFRA Air Quality Grant 2021/22 - Final Report

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Executive Summary: Solid-fuel burning air quality project

Dorset Council has undertaken a project to examine the impact a behaviour-change campaign can have on the levels of particulate matter (PM) air pollution in localities within Dorset.

A DEFRA grant was provided allowing the purchase of six AQMesh monitors, which were situated in three towns around Dorset with a high likelihood of greater proportions of solid-fuel burning appliances. Each town was assigned two monitors each: one placed in a central location, and one a more rural location with the assistance of the local town or parish council, and local businesses. Monitoring ran from 1 January 2023 to 29 June 2024. This allowed for a six-month comparison period of data between 1 January and 30 June 2023; and 1 January and 29 June 2024.

A burning behaviour survey was carried out during autumn 2022 to establish existing habits and prior knowledge.

During late summer and autumn 2023, a behaviour change campaign was conducted by Dorset Council Environmental Protection. This involved a letter and email drop to local residents, social media advertising targeted at the study locations, and information evenings held in local halls with invitations sent to nearby postcodes. These promoted DEFRA's "Burn Better" material, HETAS registration and resources, and further projects by Dorset Council during the information evenings.

Following conclusion of monitoring in June 2024, a follow-up survey was conducted with broadly similar questions to the original. The same methods were used to promote this survey to residents to establish whether behaviour changes had occurred.

Air quality monitoring data demonstrates that both $PM_{2.5}$ and PM_{10} concentrations are reduced in monitoring locations in 23/24 compared to winter 22/23. This reduction is not exclusive to, but is more pronounced at, study locations.

Survey data demonstrated an improved knowledge of suitable burning habits, in particular for knowledge regarding HETAS appliance registration and appropriate appliance maintenance. Over 80% of respondents had taken positive steps to reduce air pollution from their appliance in the last 12 months, with some 40% of respondents having seen Dorset Council promotional material.

Whilst generally promising, evidence collected does not extend as far as being able to conclusively demonstrate causality between the "Burn Better" campaign and residents undertaking better burning habits; nor improved burning habits and improved air quality. A significant confounding factor encountered is that winter 22/23 was significantly colder than winter 23/24, being 0.8°c and 1.6°c above the 1991-2020 climate averages respectively.

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Introduction

Dorset Council Environmental Protection (DCEP) received funding from DEFRA grants to undertake a project monitoring $PM_{2.5}$ within Dorset to improve knowledge and examine the impact of a behaviour change campaign on the levels of $PM_{2.5}$ pollution and how it can be reduced.

Original submission documents are available in Appendix 1.

Quarterly project progress reports were submitted to DEFRA. The most recent of these (including previous submission information) is available in Appendix 2.

Air quality monitoring data was obtained from six AQMesh air quality analysers purchased for the project from grant funding; two AQMesh air quality analysers already in operation for DCEP; and three Automatic Urban and Rural Network (AURN) analysers operated by DEFRA. Survey data was collected before commencement of monitoring (October – December 2022), and post-completion of monitoring (August – September 2024). Temperature data was obtained from the Met Office's weather stations, and climate analysis data. Air Quality and Temperature data is available in Appendix 3. Survey data is available in Appendix 4.

This final report is required within 6 months of the project's completion, which occurred with the closing of the final survey in September 2024. The project, originally estimated to be completed by December 2023, has had its timeframe extended by design (to ensure overlapping monitoring periods to facilitate comparison) and by circumstance: delays in the supply chain due to COVID-19 restrictions and General and Local Elections delaying the period in which public consultation can be conducted.

Project Aims and Methodology

The project by DCEP intended to increase the level of knowledge of $PM_{2.5}$ and decrease its emission from domestic solid-fuel burning sources through a behaviour change campaign. Increasing public concern about, and awareness of, $PM_{2.5}$ pollution drove the project, in addition to a realisation that knowledge about the quantities, concentrations and source of $PM_{2.5}$ were relatively unknown in comparison to other pollutants.

During the determination of the methodology, it was considered that two factors would need to be examined: the concentrations of PM pollution in the project study areas, and the behaviour change seen as a result of the campaign. Due to equipment limitations, it would not be possible to speciate the PM collected by the analysers, therefore a causal link would not be possible to determine.

Four work packages were identified during the application and award phase – these are available in Document Q06 – Appendix 1. The methodology is given in more detail below.

This project aligns with the Dorset Council Plan 2022-2024 in that it seeks to protect the natural environment, climate and ecology, and create stronger, healthier communities. Improving these goals are key to protecting Dorset's natural environment including a World Heritage Site and two National Landscapes, and its older population with incomes below the national average: two key groups more likely to affected by poor air quality.

Sourcing and location of Monitors

DCEP submitted its bid for funding based on costings provided by AQMesh for the pod analysers, and as such six pods equipped with solar panels were sourced as anticipated.

The study locations were determined by considering several factors. DC Building Control were contacted to determine the locations of inspections in which a solid-fuel burning appliance had been included, and a list of postcodes identifying areas where properties were located was provided. Further data used to inform the decision included:

- Monitoring already occurring
- Potential monitoring locations
- Major roads within the location
- Possible major background PM sources
- Proportion of properties not connected to national gas network

Comparison of locations led to a decision that the three best locations to monitor would be Bridport, Maiden Newton and Swanage. This was due to their high proportion of known appliances, multiple possible monitoring locations away from major roads, high proportion of properties not connected to the national gas network, and a mixture of background PM sources (sea salt and agriculture; agriculture; and sea salt respectively).

Following discussions with DC's Highway Infrastructure team it was quickly determined that lighting apparatus could neither support the mass of the pods. Installation of dedicated posts was prohibitively expensive. As such local town/parish councils and businesses were asked for assistance in identifying suitable monitoring locations – with one location occupying a town-centre location, and one occupying a location more removed from the centre. The monitoring locations, including details of the background and AURN monitors utilised in provided in *Table 1*.

Location Name	**Serial No.**	**Reference**	**Easting**	**Northing**
Bridport Plottingham Depot	2450943	943	346151	92955
Swanage Kings Depot	2450944	944	402501	78888
Maiden Newton MUGA	2450945	945	359399	98715
Swanage Cemetery	2450946	946	401897	80097
Maiden Newton Garage	2450947	947	359892	97587
Bridport Cemetery	2450948	948	347684	93004
Beaminster School	1766150	1766	347967	101925
Ferndown Golf Club	1767150	1767	408411	99670
Bournemouth AURN		BORN	412322	93343
Charlton Mackrell AURN		MACK	352196	128768
Honiton AURN		HONI	315749	99874

Table 1: Name, reference and location of air quality monitoring equipment

Monitors were ordered, delivered and installed by DC site agents for commencement of monitoring on 1 January 2023.

Polygons of postcodes of residential areas surrounding the town-centre monitoring locations were created, and addresses within those postcodes were written to inviting their participation in all engagement opportunities. These addresses remained consistent throughout the campaign – known as "target households."

Maps of monitoring locations and polygons of targeted addresses are provided in Appendix 6.

Behaviour Change Campaign

A pre-monitoring survey of residents in study towns was written and made available on the DC website. This was open to responses between 2 November 2022 and 31 January 2023. Invites and adverts were used to encourage participants to respond, with 1689 letters sent, and Facebook advertising receiving 55,377 impressions. The survey received 360 responses, of which 172 respondents had a relevant appliance.

Three evening "Creating Clean Air Communities" events – one in each study town – were held to discuss the project, publicise improved burning habits, and inform residents of other ongoing DC projects to improve air quality. These events were held in late September and early October 2023. Advertising and invites to community groups and pages was deployed to support these.

Advice and best practice for solid fuel burning was shared, to include DEFRA and HETAS content, via seven social media posts, 1689 letters to target households, 535 emails to target households and a dedicated advice page on Dorset Council's website.

A post-monitoring survey of residents in study towns was written and made available on the DC website. This was open to responses between 25 July 2024 and 30 September 2024. The survey received 286 responses, of which 67 respondents had a relevant appliance. Letters and adverts promoting surveys are available in Appendix 4.

A full summary of the publicity campaign is available in Appendix 5, with examples of promotional materials and advertisements shared on social media, and those used during Creating Cleaner Air Communities events.

Data Analysis

Data from 8 AQMesh analysers, 3 AURN analysers and 2 surveys were collected. AQ data averages were created for each 24 hour period between: 1 January 2023 and 29 June 2024 for the six study-site ("STUDY") monitors ("943", "944", "945", "946", "947", "948") and; 1 January 2022 and 29 June 2024 for the two background DC ("BACK") monitors ("1766", "1767") and three AURN ("AURN") analysers (Bournemouth "BORN", Charlton Mackrell "MACK", and Honiton "HONI"). Data for both $PM_{2.5}$ and PM_{10} were collected, except for BORN which only collected $PM_{2.5}$. Analyser 945 – Maiden Newton MUGA – stopped collecting data in February of 2024. This fault was not realised until close of data collection.

Environmental data was collected from the Met Office. This comprised of the monthly minimum and maximum average temperature for three locations: Chivenor, Hurn Airport and Yeovilton RNAS. From this a monthly average temperature was calculated. Monthly average temperatures were collected for years 1991 – 2020 (i.e. a 30 year climate average) for the corresponding 12km^2 grid location from the Met Office's HadUK gridded dataset.

Comparison of data was carried out between:

- Each STUDY monitor in the same location
- Each STUDY monitor against the mean of the STUDY monitors
- Each STUDY monitor against the mean of the BACK monitors
- Each STUDY monitor against the mean of the AURN monitors
- The mean of the STUDY monitors, the mean of the BACK monitors, and the mean of the AURN monitors, against the difference between the monthly average temperature (Jan 2022 – June 2024) and the 30 year climate average (1991 – 2020).

Results and Discussion

Air quality monitoring and weather and climate data are available in Appendix 3.

Comparison of monthly means between winter 2022/23 (January 23 – March 23) and winter 2023/24 (October 23 – March 24) show considerably lower levels of PM pollution across all sites. *Figs. 1-7* and *Figs. 10-16* demonstrate this difference in each study site, in addition to the STUDY mean. The BACK mean comparisons for the same period demonstrate a consistency with the trend, although somewhat less pronounced (*fig. 8* and *fig. 17*). The AURN means demonstrate the same trend again, but with a further less pronounced difference (*fig. 9* and *fig. 18*).

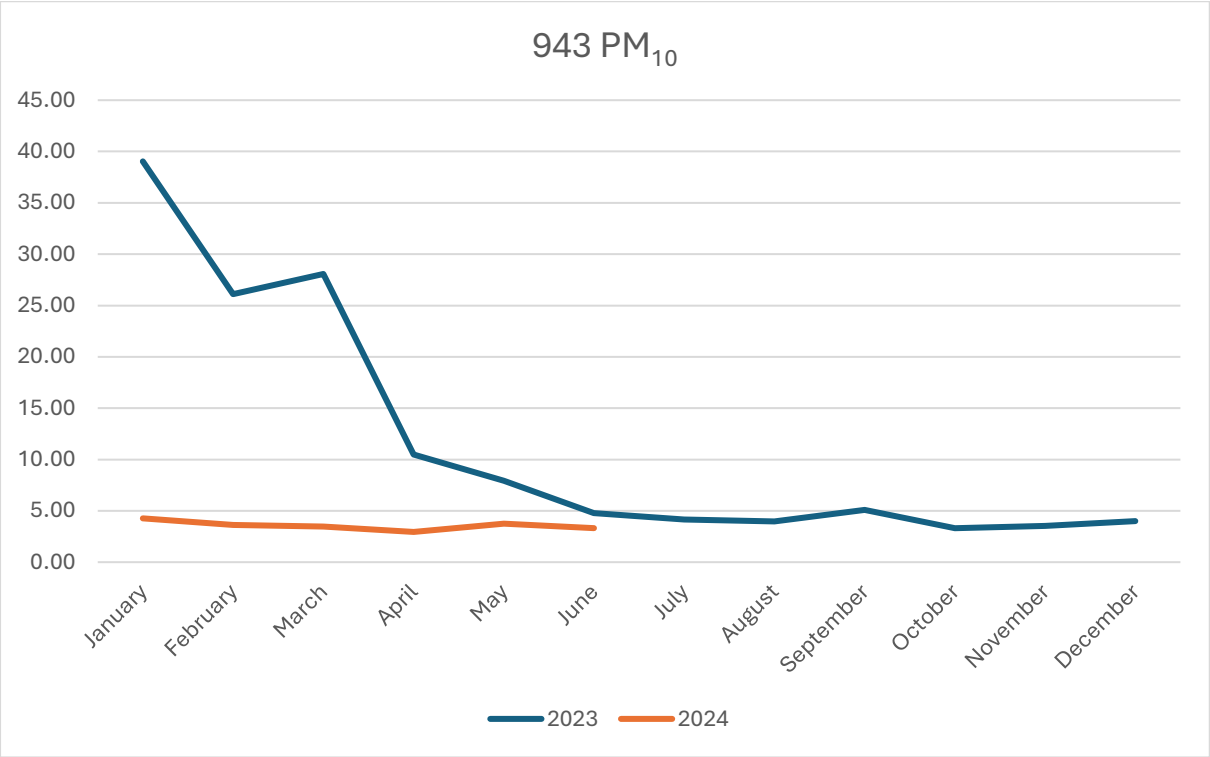

Fig. 1 - 943 Bridport Plottingham Depot PM_{10} January – December 2023, January – June 2024

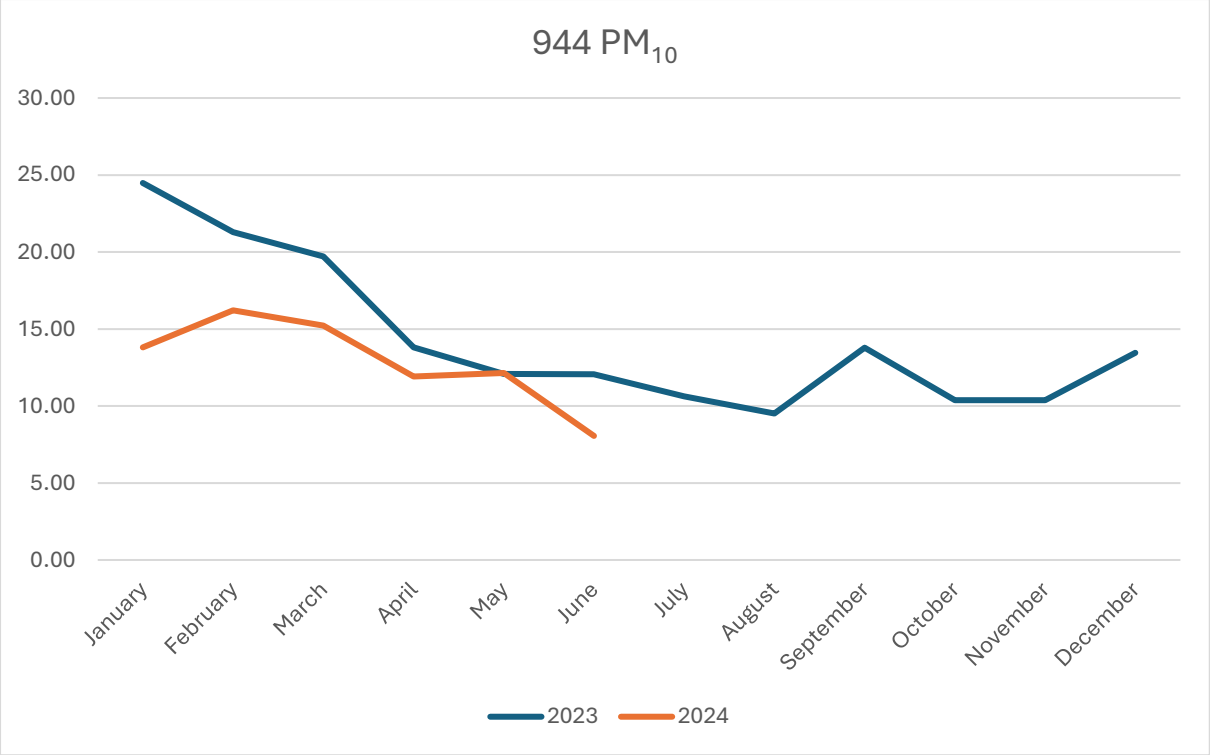

Fig. 2 - 944 Swanage Kings Depot PM_{10} January – December 2023, January – June 2024

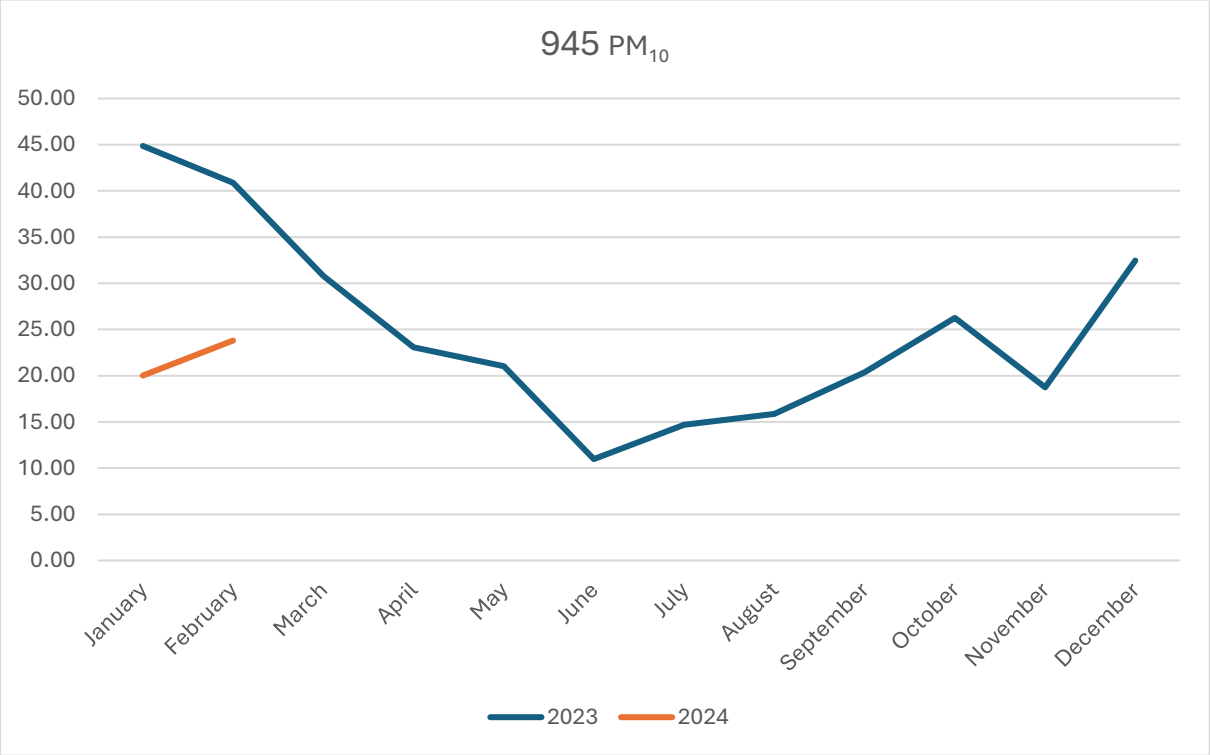

Fig. 3 - 945 Maiden Newton MUGA PM_{10} January – December 2023, January – June 2024

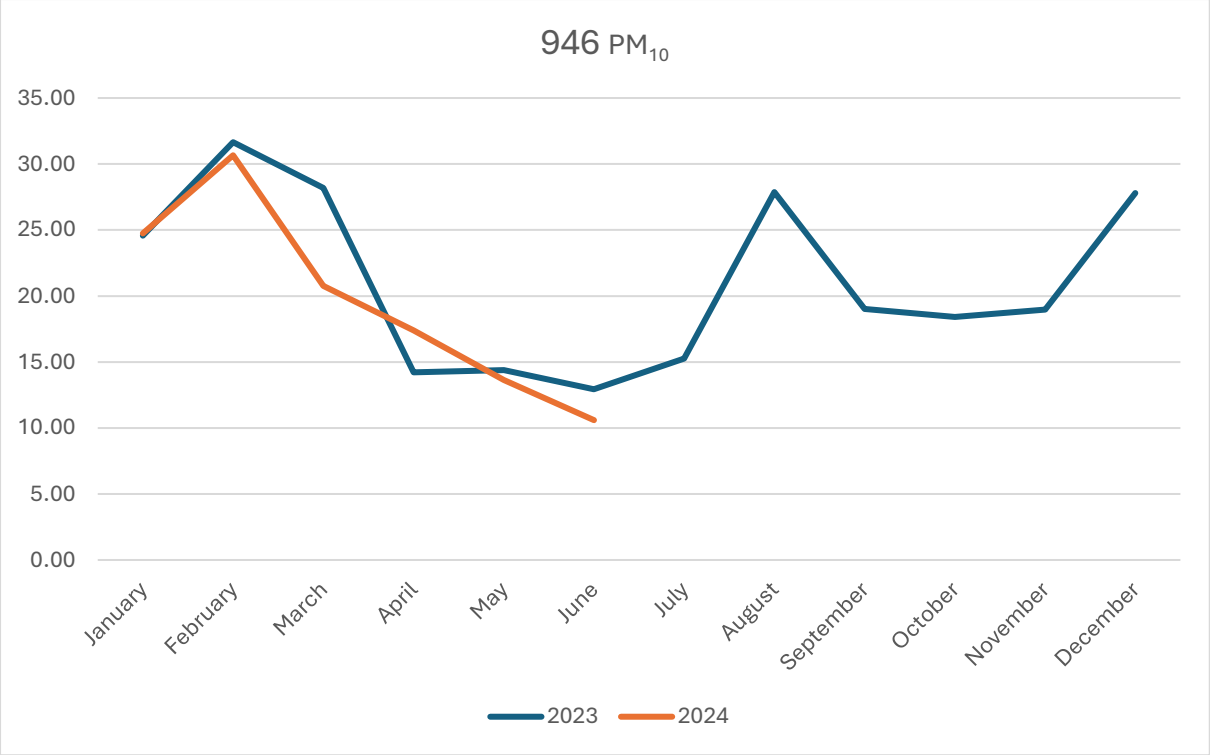

Fig. 4 - 946 Swanage Cemetery PM_{10} January – December 2023, January – June 2024

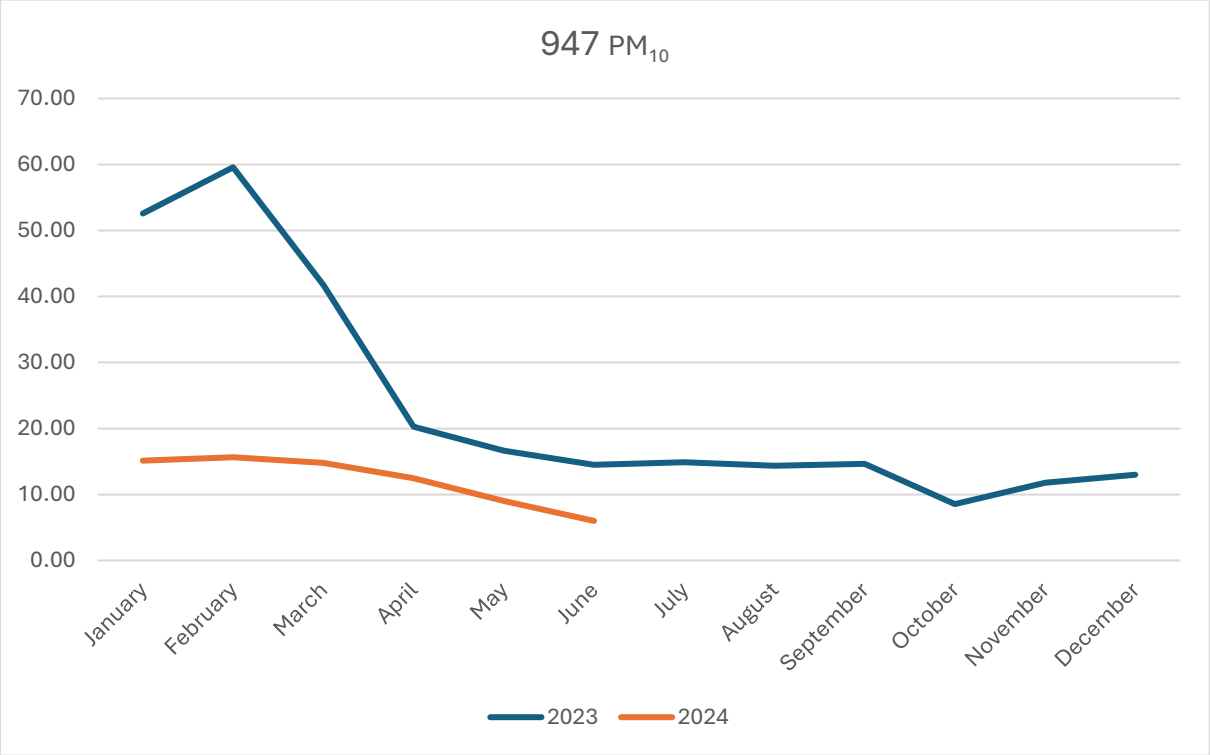

Fig. 5 - 947 Maiden Newton Garage PM_{10} January – December 2023, January – June 2024

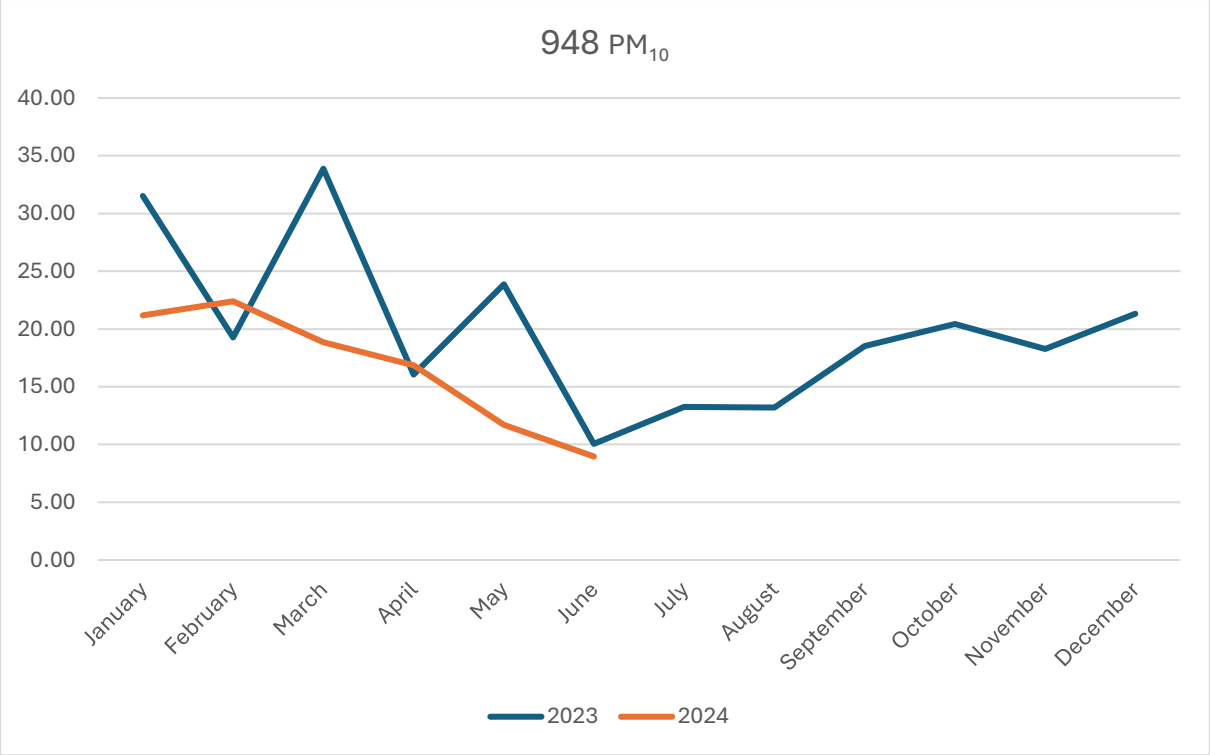

Fig. 6 - 948 Bridport Cemetery PM_{10} January – December 2023, January – June 2024

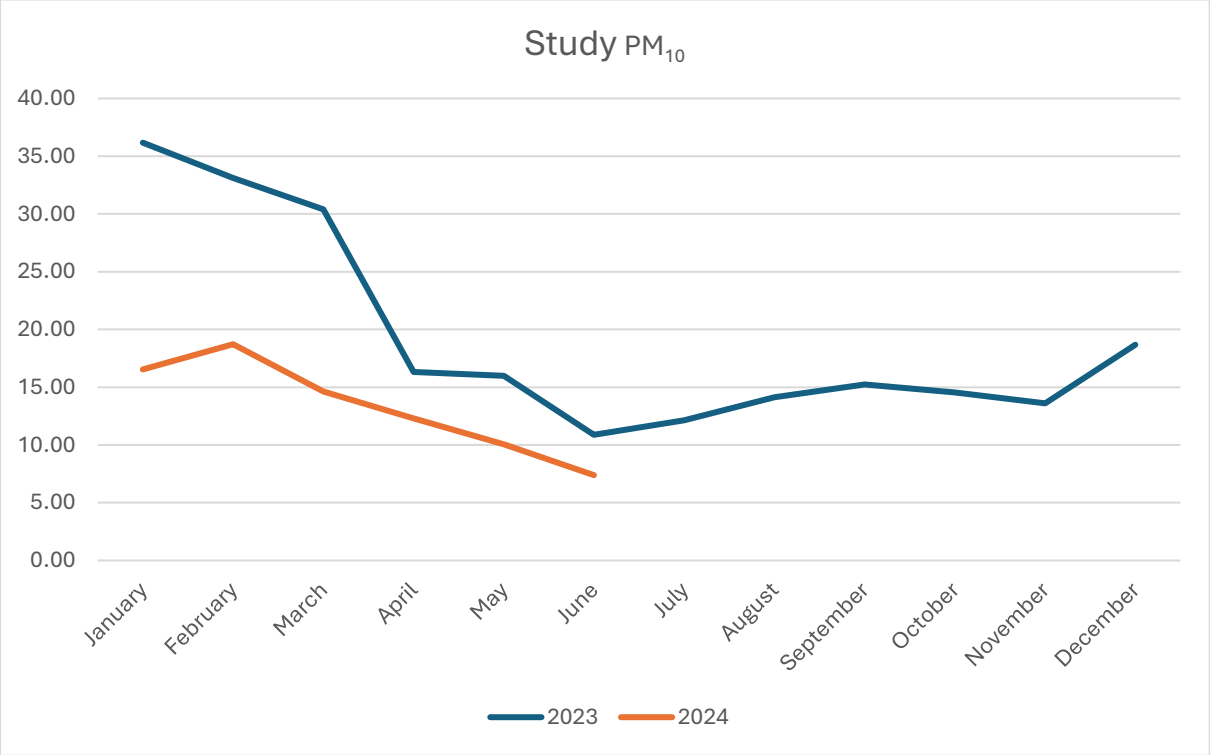

Fig. 7 - Study Average PM_{10} January – December 2023, January – June 2024

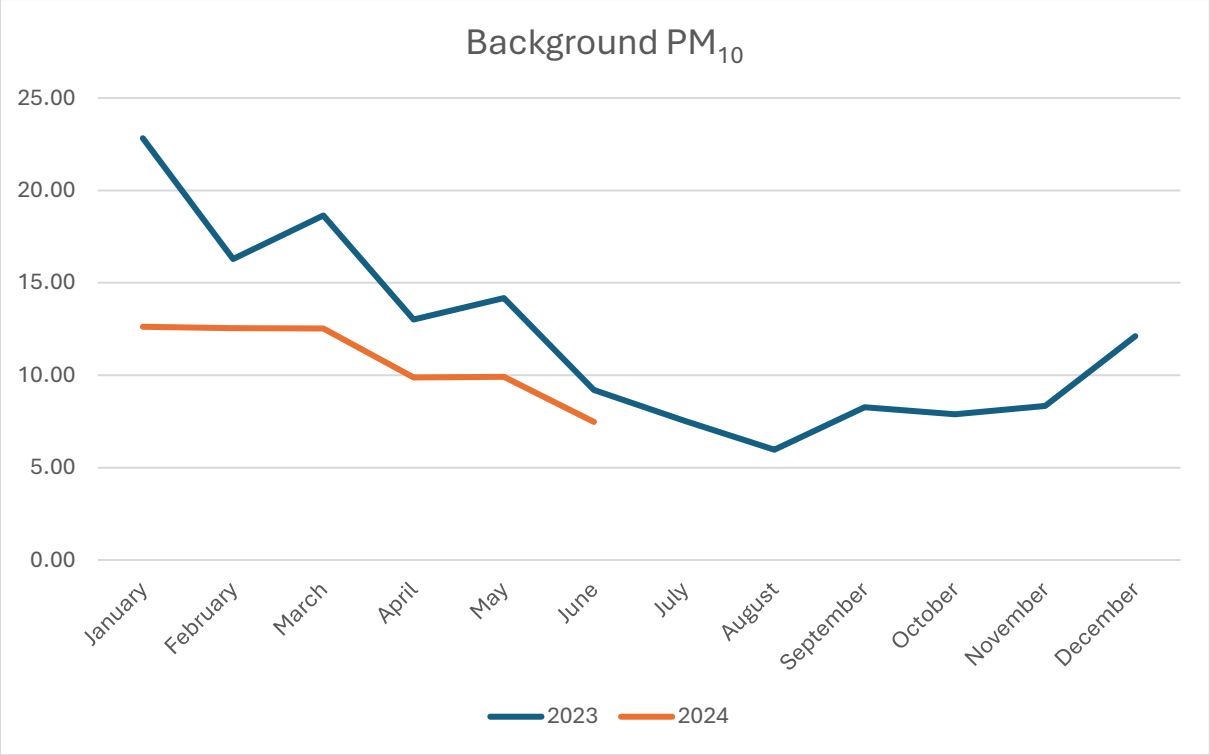

Fig. 8 - Background Monitor Average PM_{10} January – December 2023, January – June 2024

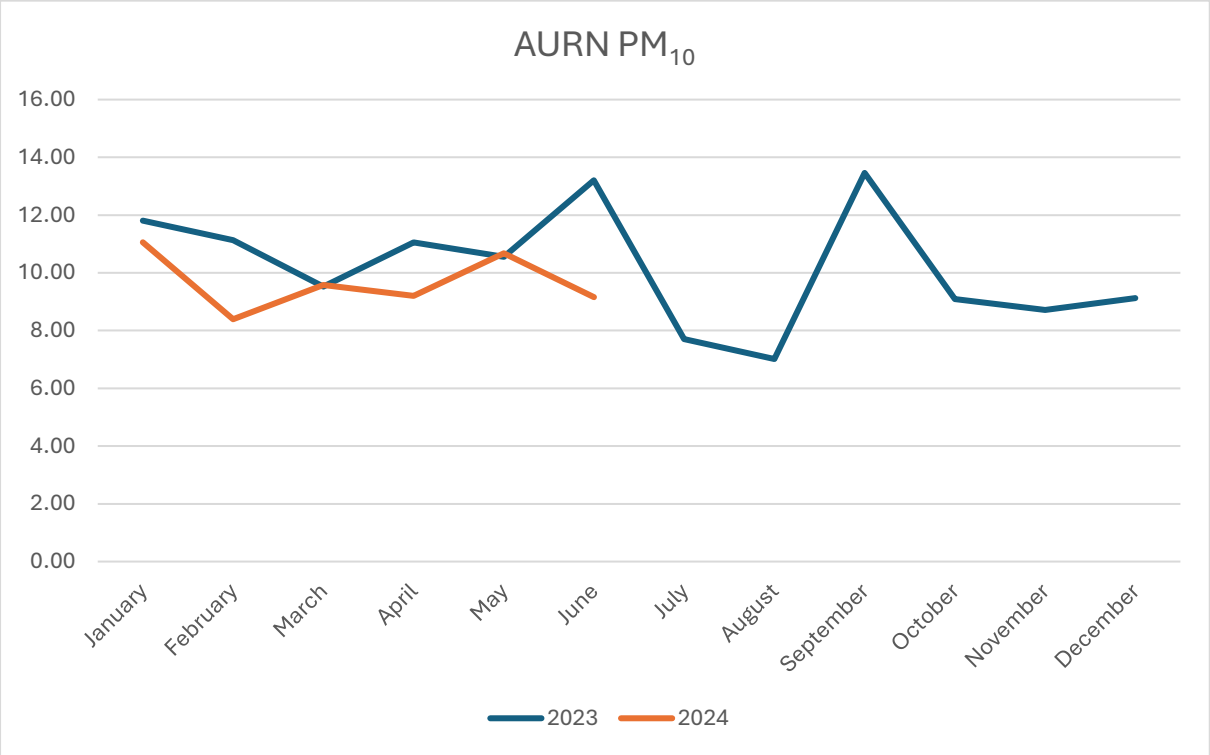

Fig. 9 - AURN Average PM_{10} January – December 2023, January – June 2024

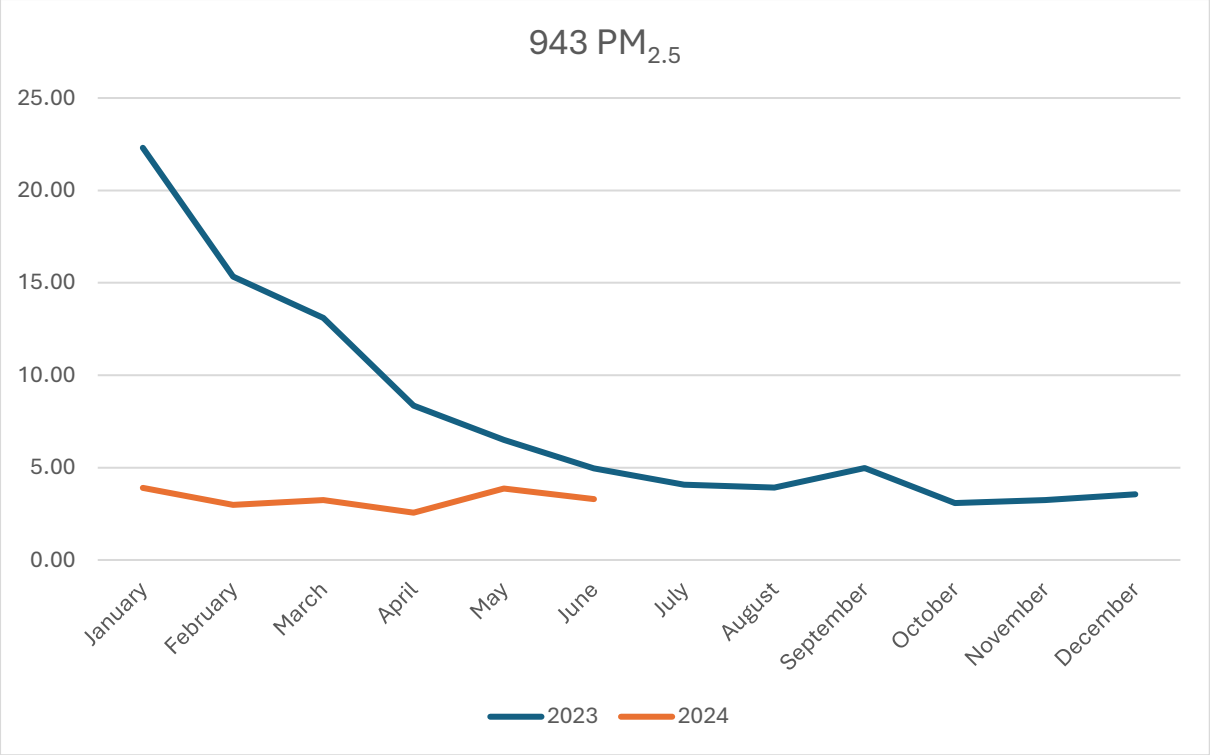

Fig. 10 - 943 Bridport Plottingham $PM_{2.5}$ January – December 2023, January – June 2024

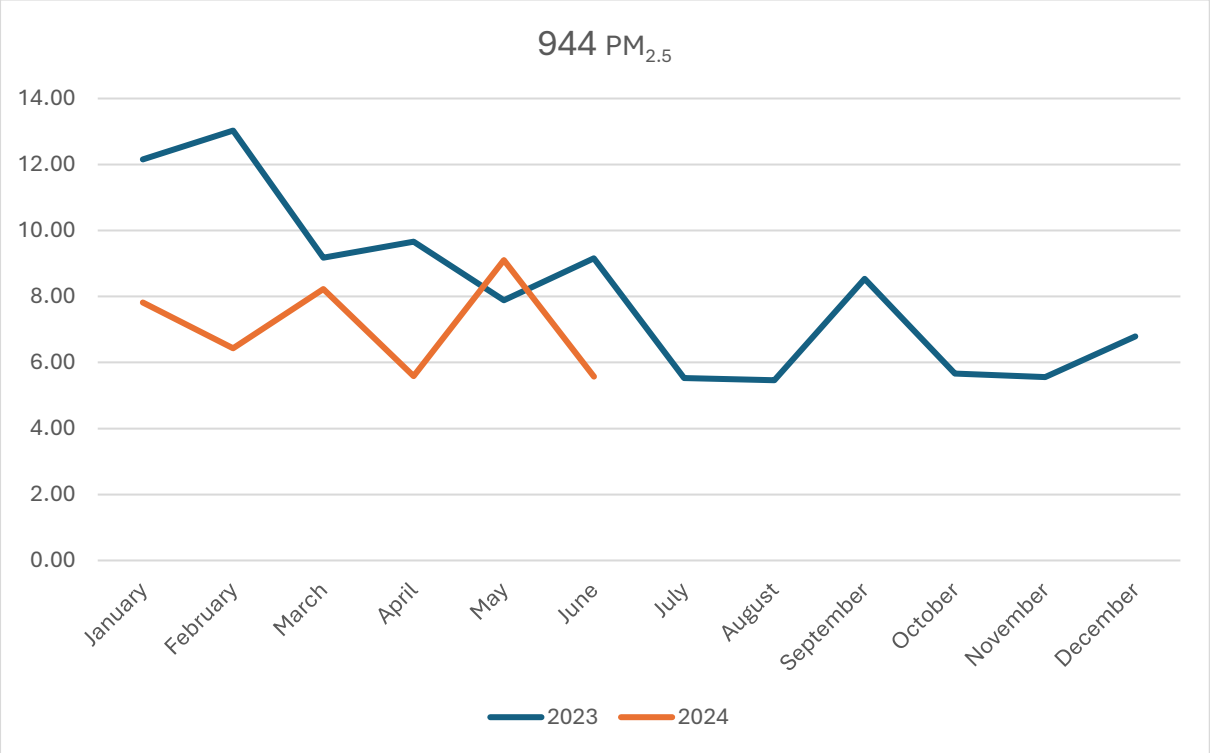

Fig. 11 - 944 Swanage Kings Depot $PM_{2.5}$ January – December 2023, January – June 2024

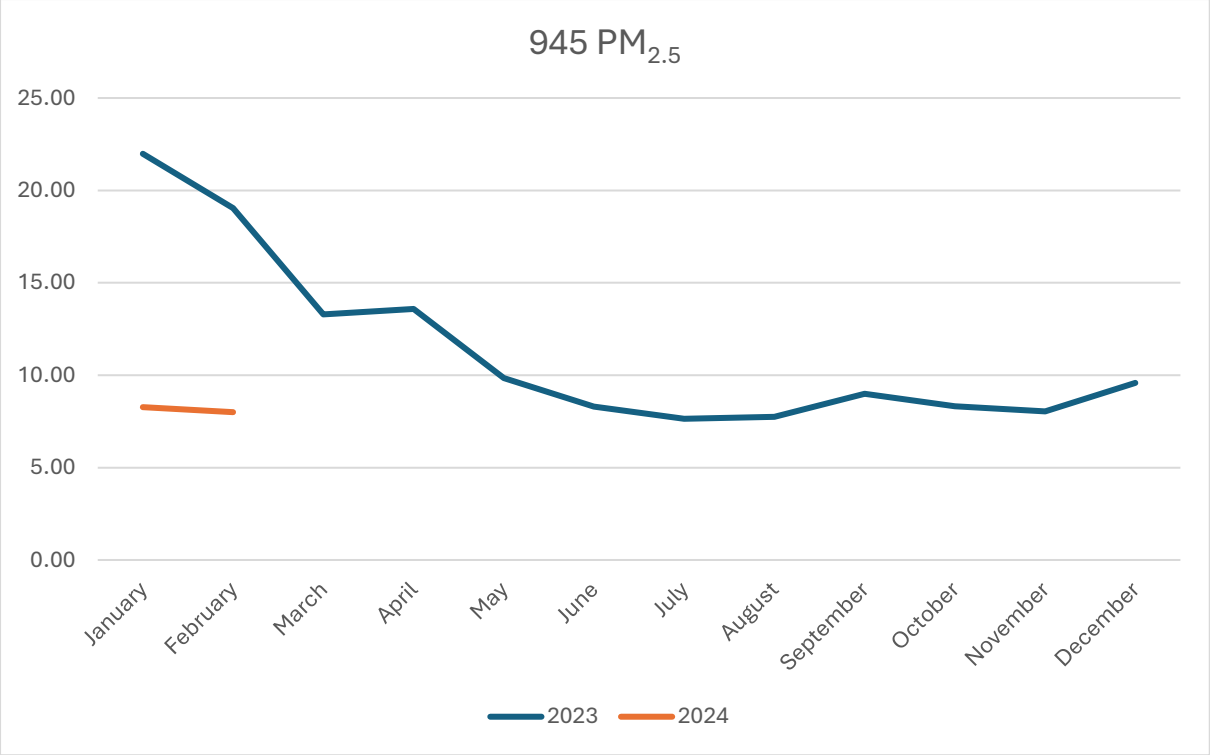

Fig. 12 - 945 Maiden Newton MUGA $PM_{2.5}$ January – December 2023, January – June 2024

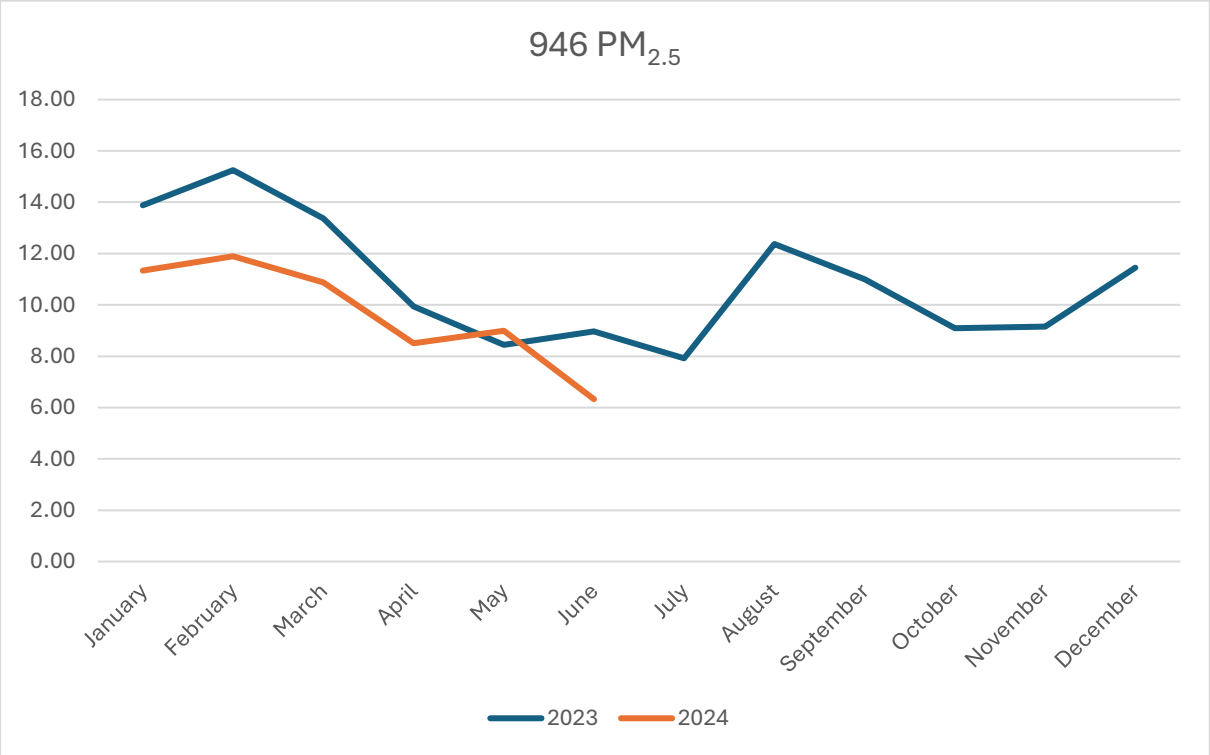

Fig. 13 - 946 Swanage Cemetery $PM_{2.5}$ January – December 2023, January – June 2024

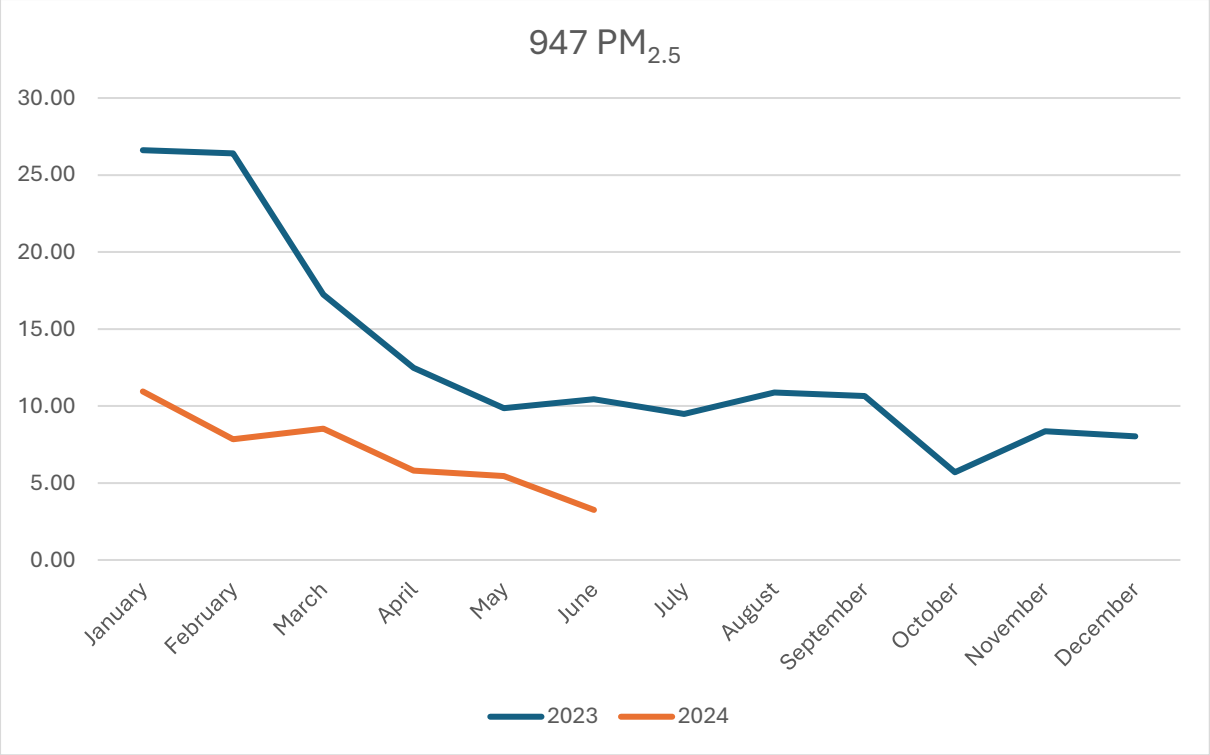

Fig. 14 - 947 Maiden Newton Garage $PM_{2.5}$ January – December 2023, January – June 2024

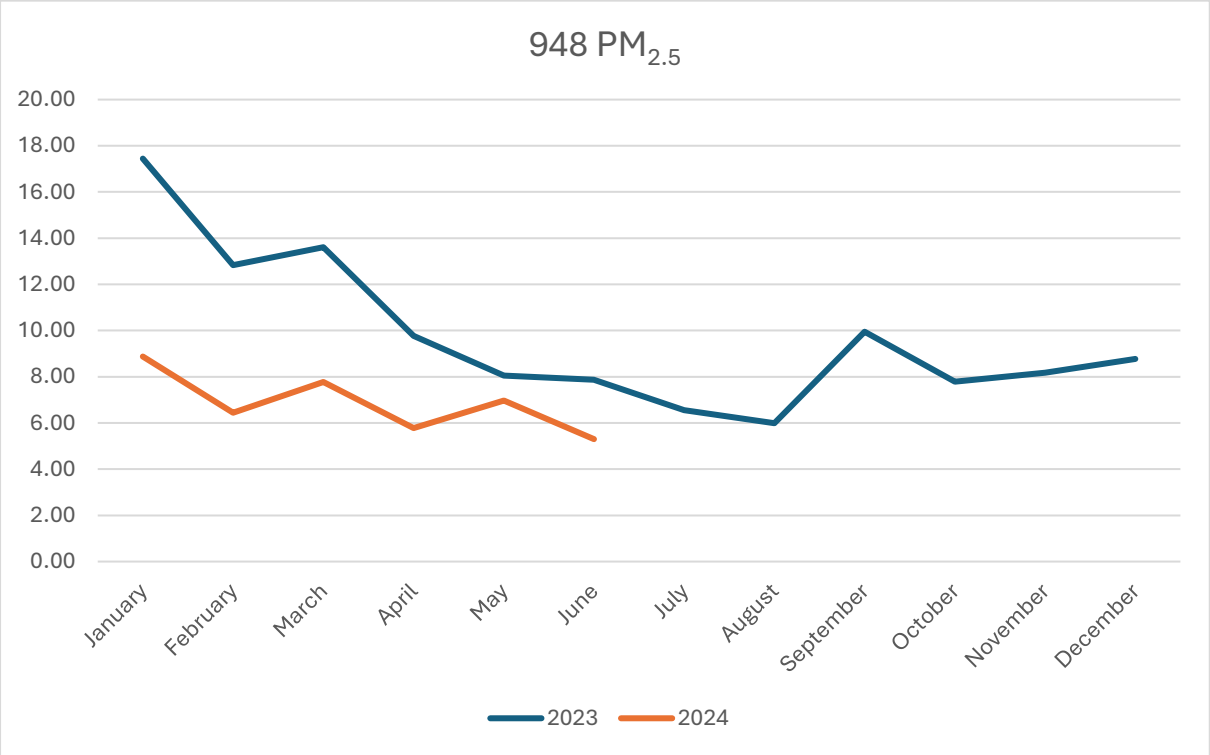

Fig. 15 - 948 Bridport Cemetery $PM_{2.5}$ January – December 2023, January – June 2024

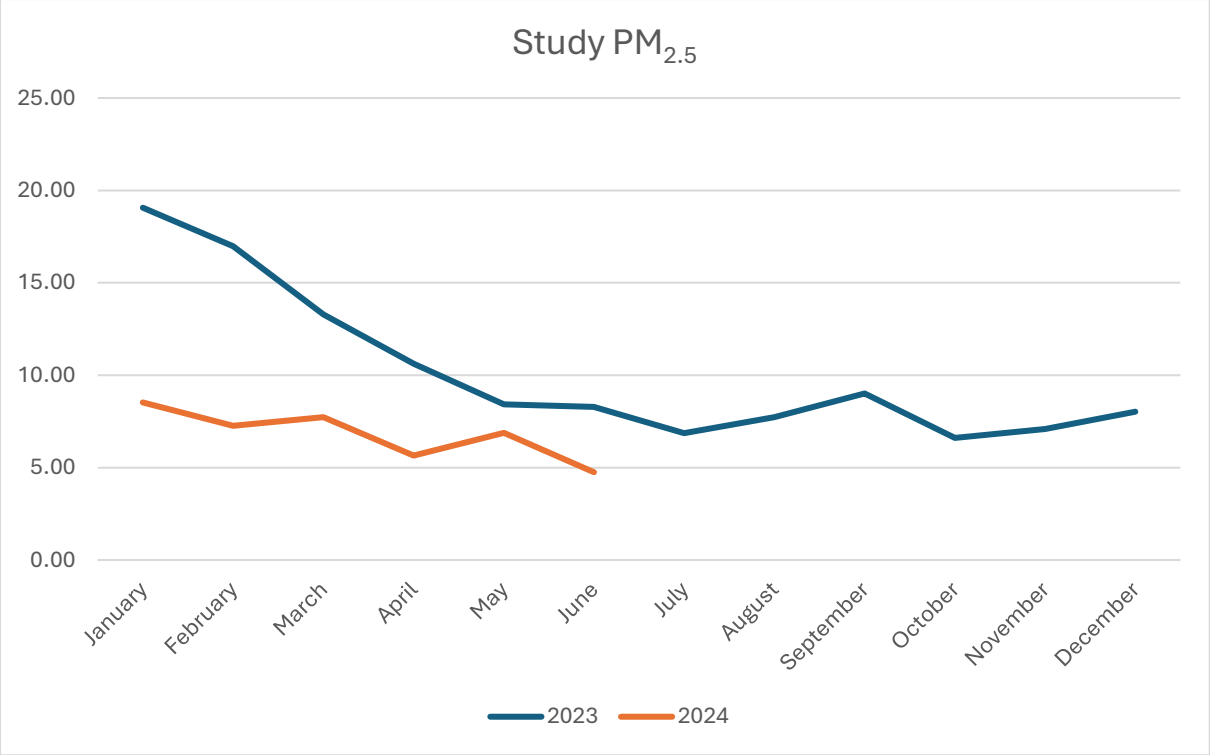

Fig. 16 - Study Average $PM_{2.5}$ January – December 2023, January – June 2024

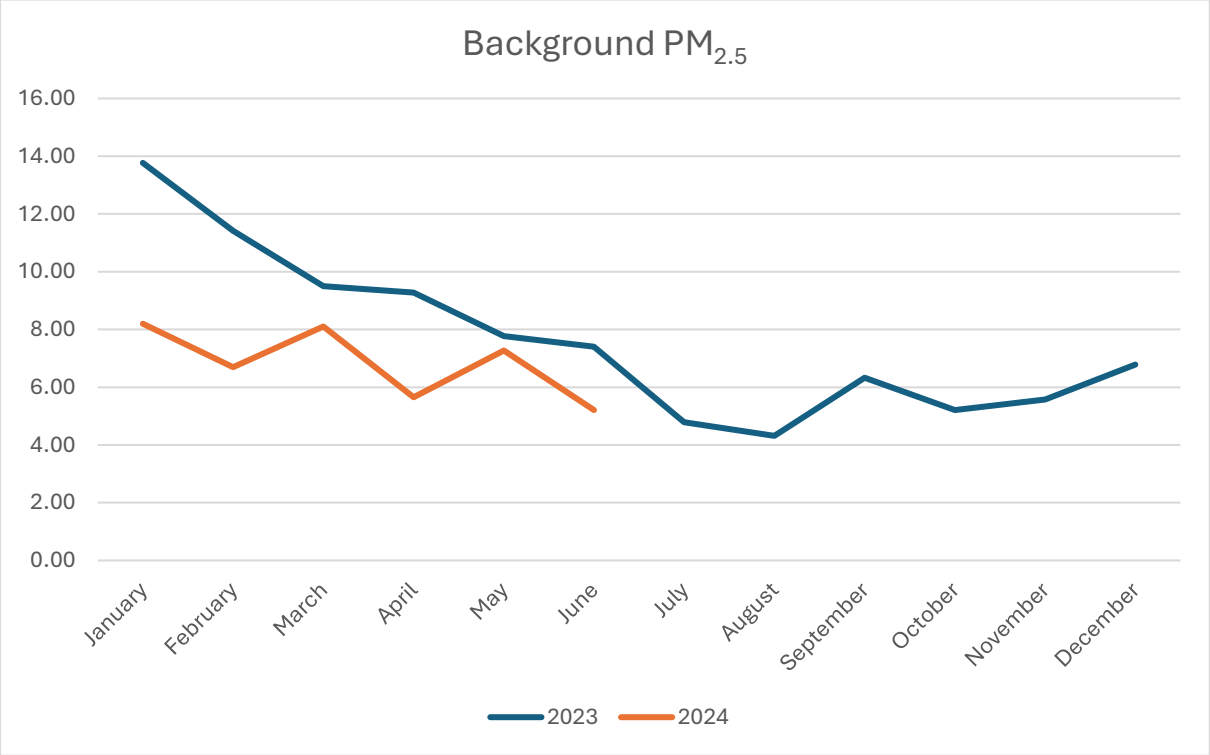

Fig. 17 - Background Monitor Average $PM_{2.5}$ January – December 2023, January – June 2024

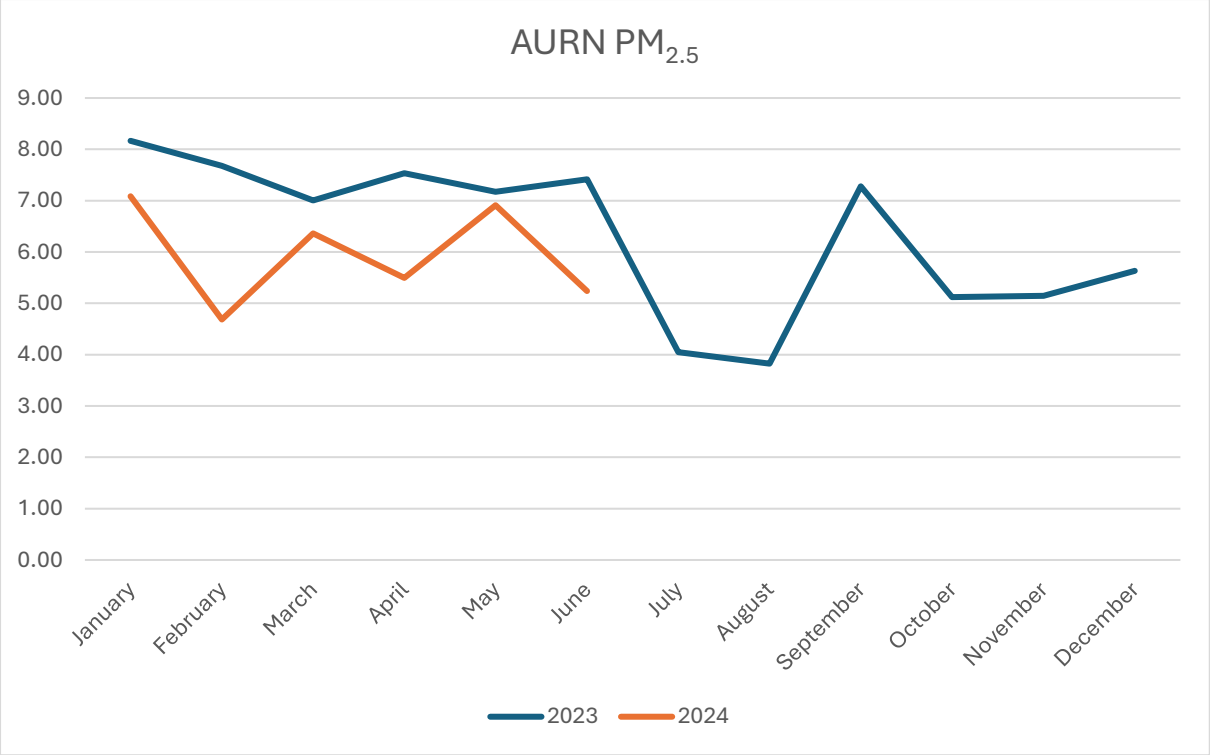

Fig. 18 - AURN Average $PM_{2.5}$ January – December 2023, January – June 2024

Comparing all means to each other, all monitors encountered significantly higher PM levels during January 2023 that was not repeated in January 2024 (*fig. 19* and *fig. 20*).

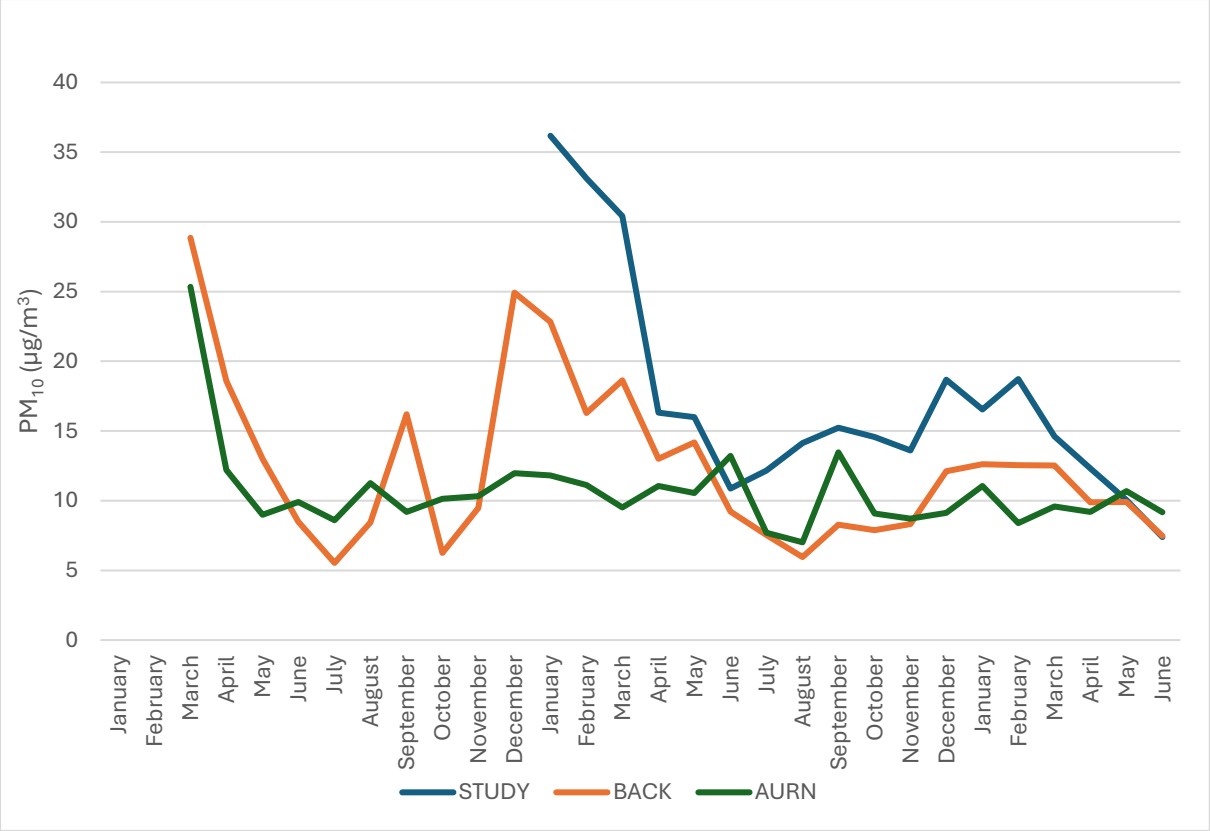

Fig. 19 - Average PM_{10} January 2022 - June 2024

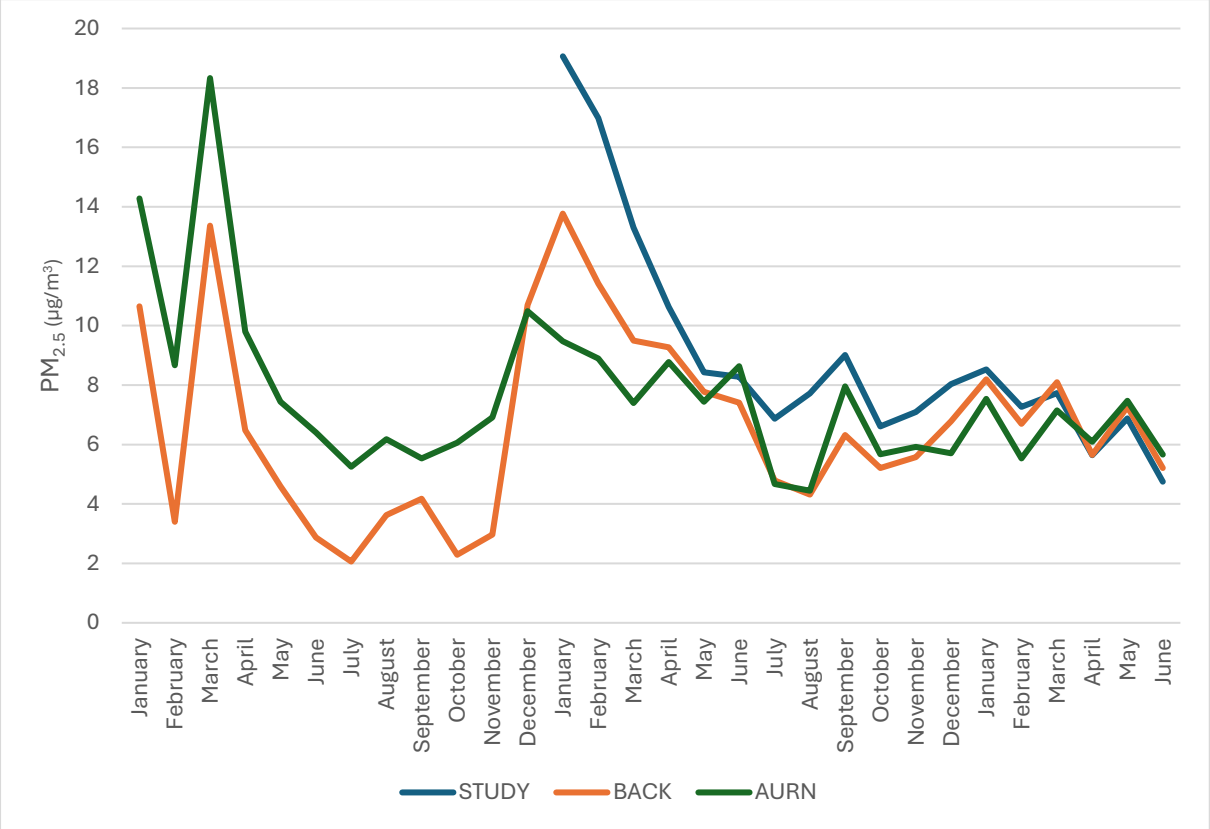

Fig. 20 - Average $PM_{2.5}$ January 2022 - June 2024

The levels reduced consistently into the summer, and then re-increased the following autumn into winter, but to a far lesser degree. The inclusion of 2022 background data was to demonstrate the trend in autumn 2022, when study-specific monitoring data was not yet available.

Calculating and plotting the percentage differences between January – June 2023 and the same period in 2024 show study sites improved to a far greater degree than non-study BACK and AURN sites. The difference between 2023 and 2024 for the average of study sites consistently remains above the same difference in average for BACK sites and AURN sites (*fig. 21* and *fig. 22*) for both pollutants.

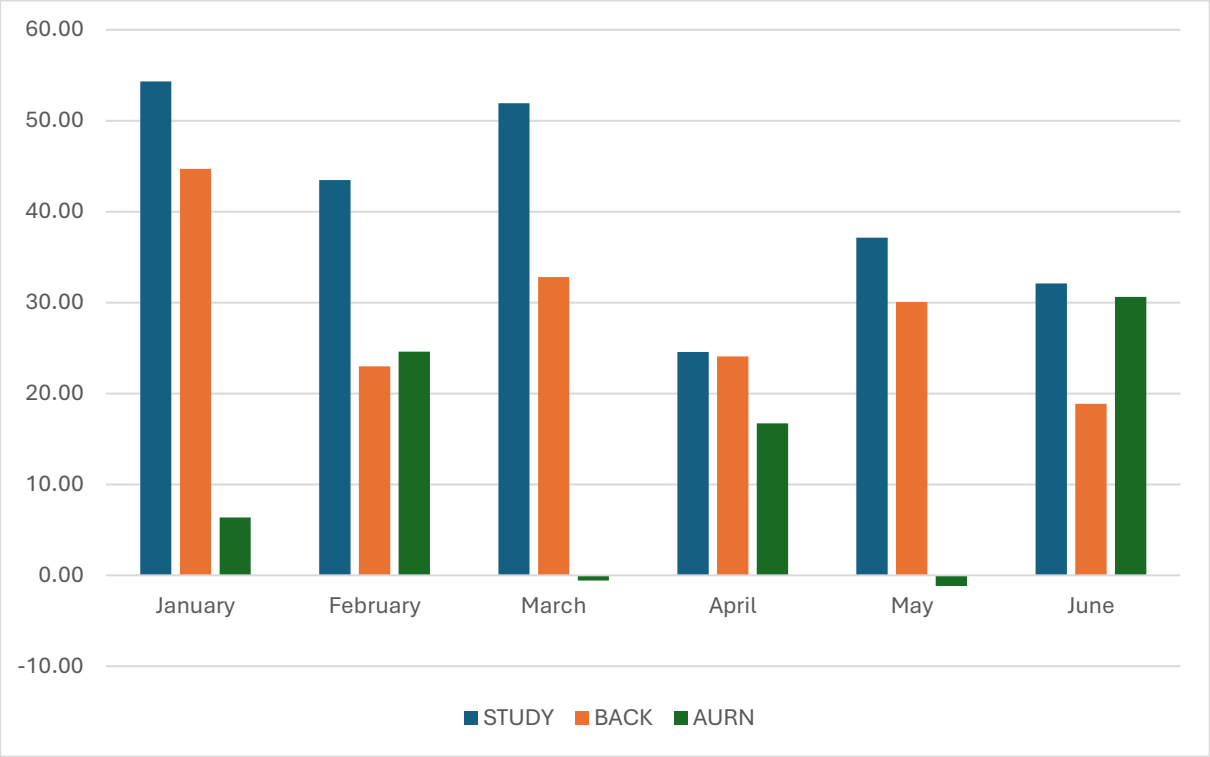

Fig. 21 - % difference in monthly average PM_{10} readings 2023 - 2024

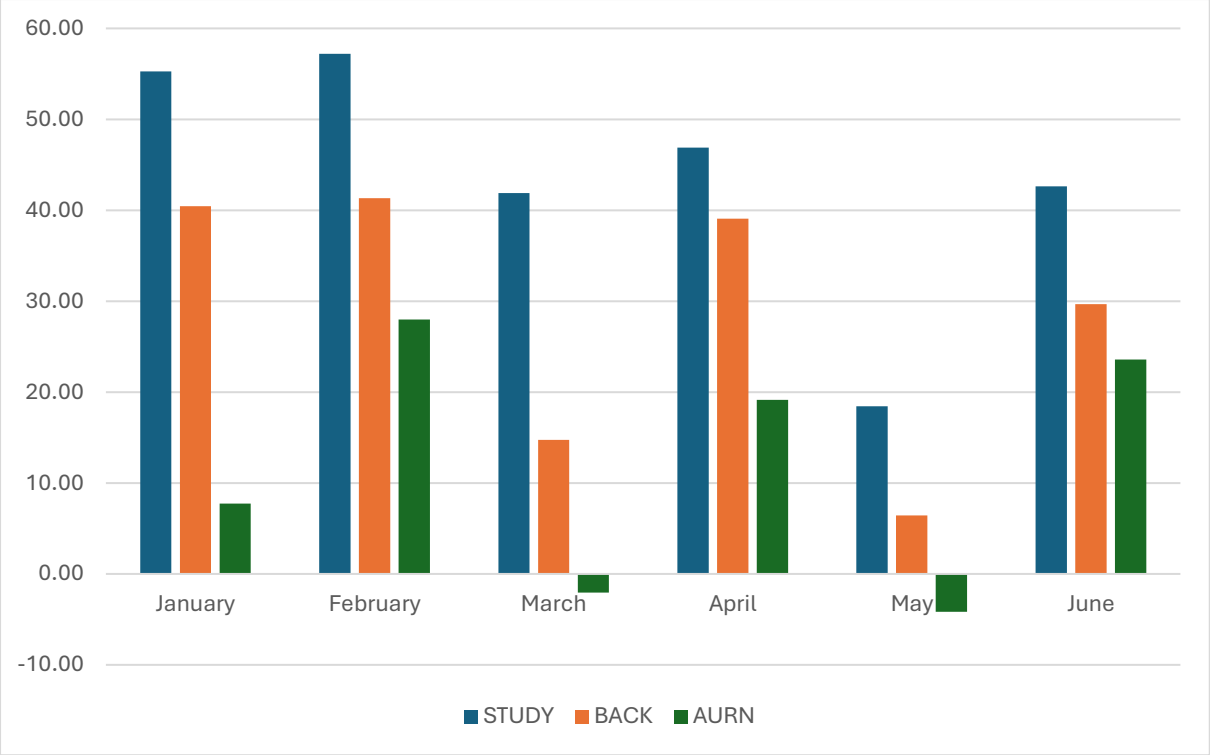

Fig. 22 - % difference in monthly average $PM_{2.5}$ readings 2023 - 2024

Individual variability of monitors is considerable, hence the use of averages to draw larger picture conclusions. It is clear AURN monitors are far less susceptible to localised variations – this is likely due to the higher degree of accuracy and technology of the equipment.

Behaviour surveys demonstrated limited evidence that the behavioural campaign had a positive impact on burning habits. The proportion of respondents using their appliance for aesthetic or principal heating purposes decreased (2.5% and 9.4% respectively). Pre-knowledge questions demonstrated a good level of foundational knowledge from respondents: only 11% of respondents indicated no knowledge of the Government's Clean Air Strategy (32% no answer) and only 14% did not know what fine Particulate Emissions were (0.6% no answer). Positive news was present in the form of 82.1% of respondents taking one or more "positive" actions for improving their burning habits, however it was not possible to establish whether this was due to the campaign, or whether they would have taken this step anyway. 40% of respondents had seen one or more of DC's campaign communications, but only 1 respondent had attended a Creating Cleaner Air Communities event, with one further respondent unsure. Analysis of responses to behaviour questions demonstrated that positive changes in behaviour were occurring. 14% more people were aware of HETAS registration and whether their appliance had it or not. Fewer people were using their appliance as their main source of heating or for aesthetic purposes, with use as additional warmth being the increasing use (13%). Whilst respondents reported sweeping chimneys and servicing appliances less often, the proportion of responses indicating an appropriate sweeping/servicing intervals (circa annually) increased (10% and 15% respectively); although this did not reduce the number of people not sweeping/servicing (this was low to begin with). The

number of respondents burning seasoned wood, and waste wood and offcuts, had both reduced (by 2%), however these questions attracted a high rate of "not answered" (circa 14% and 18% for beginning/closing surveys respectively). Few conclusions can be drawn from a question asking for how long residents seasoned their firewood due to changes in the questions asked and options available for answering. Lastly, despite the good prior knowledge demonstrated in the opening survey, respondents demonstrating knowledge of the dangers of poor burning habits (both to their homes and the environment) improved, with those answering "all of the above" increased by 7%, and those answering "none of the above" decreasing by 3%. The disparity in response rate, however, should be noted. 172 valid responses were received for the beginning survey, but only 67 for the ending survey. A fully summary of responses is provided in Appendix 4.

A further confounding factor encountered can be seen from weather data gathered for January 2022 – June 2024. In summary, it demonstrates clearly that October 2022 – March 2023 experienced far cooler temperatures than the same period a year later (*fig. 23* and *fig. 24*): with 2022/23 0.8°c above the 30 year climate average, and 2023/24 1.6°c above the same measure.

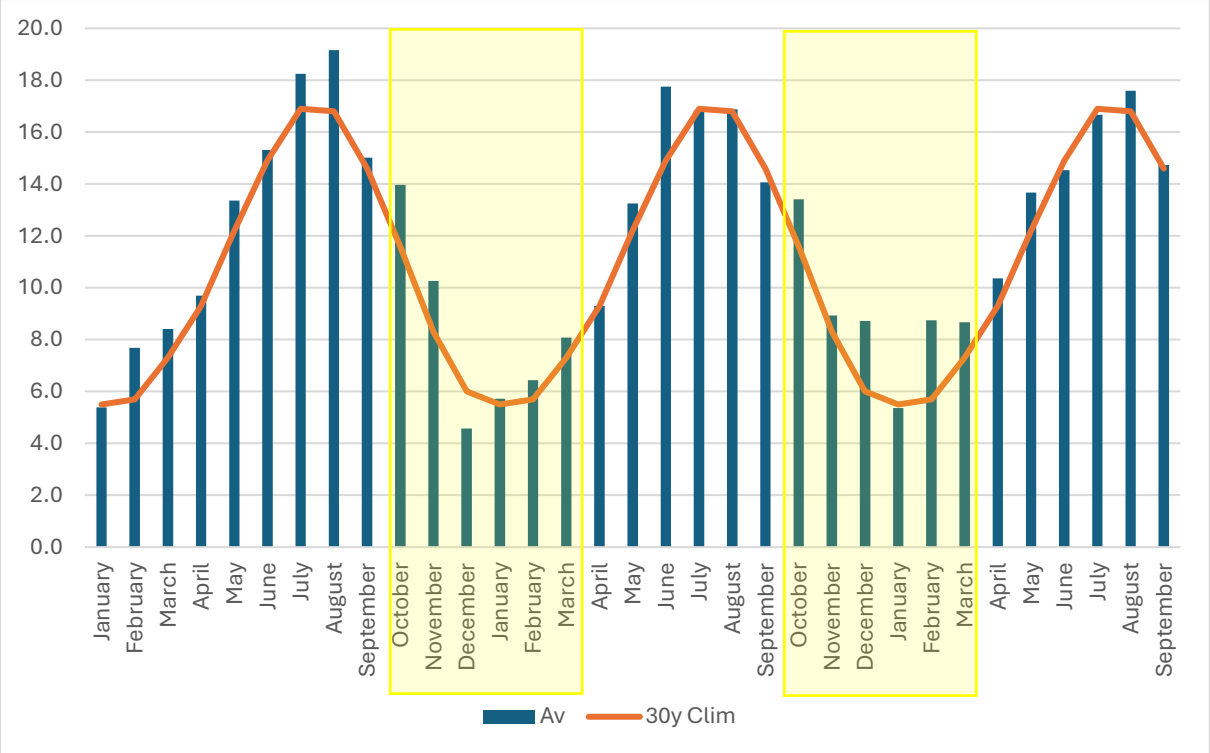

Fig. 23 - Average monthly temperature and monthly 30y climate average, January 2022 – September 2024

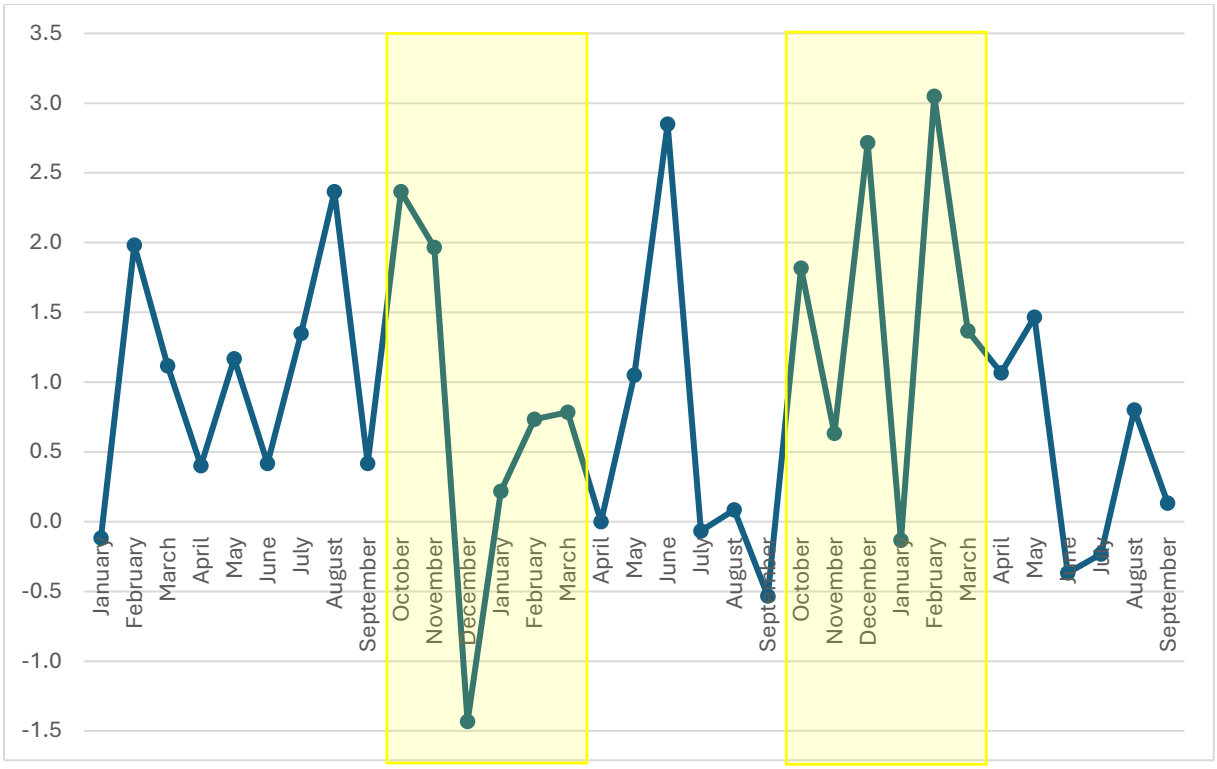

Fig. 24 - Difference between (°c) average monthly temperature and monthly 30y climate average, January 2022 – September 2024

The variability in individual monitor measurements, the comparative low-technology of AQMesh pods in comparison to AURN monitors and the difference in weather between the two winter periods in question lead the report to urge caution when drawing conclusions from the data. A wider study on the same topic would be a future avenue for consideration, particularly given the potential variability within human behaviour and other influencing factors on burning behaviours such as fuel prices and weather.

Outputs and Benefits

The principal measurable output of the project is the significant quantities of data from air quality monitoring and surveys. The collected evidence, as discussed in the previous section, demonstrates a possibility that actions undertaken by DCEP had a meaningful impact on the levels of $PM_{2.5}$ and PM_{10} pollution in study areas. Whilst is it not possible to fully conclude this, it is demonstrable that areas in which action was taken have shown a greater decrease between winter 22/23 and winter 23/24 than non-study sites. An improvement in air pollution is a valuable outcome, and in some cases the improvements exceeded a 50% reduction. Any reduction in air pollution is a valuable outcome, as the effect on the general health of the public in the locality will improve.

Improvements have also been seen in fuel burning habits given the responses to surveys. It is believed that this is largely due to the tone of messaging and promotion of the benefits of the good burning habits specifically to the user. Rather than focussing on air quality, advice and promotions primarily focussed on heating efficiency and fuel efficacy with air quality added at the end as a "bonus". Partners such as HETAS were invited to community events, and DEFRA "Burn Better" campaign materials were used, meaning information was easily available and easily signposted to. Whilst it is difficult to conclusively draw conclusions of causality, the comparative low cost for the promotions, and the positive initial air quality data demonstrate potential significant benefit to the use of such methods to improve burning habits.

The principal benefits of having conducted the project include an improved knowledge and understanding of PM monitoring and data processing; an improved capacity to measure air quality parameters in future; improved knowledge and understanding of air quality pollutants within the council; improved knowledge and understanding of positive burning practices in the wider community; and improved understanding of effective behaviour change methods available on a limited budget. A key driver of this project was the impact upon air quality at limited cost: budgeting shows a total expenditure on promotion to be £4000 which generated approximately 70000 impressions.

Difficulties encountered in the project stem from a foundational error in considering the scale of the project. The project should have been designed on a smaller scale to more closely control variables outside of the project, and monitor more efficiently within one locality, rather than study three at once. This would have had numerous further benefits too. Siting monitors and ensuring relevant study locations would have been simpler, and one, key, community partner may have been able to further assist with this. Consequently, communication from DC to local community and elected officials may have been improved and allowed for a better understanding of local politics and political influence by the project team. Due to the scale, this understanding was complicated and thus relationships were not used to their fullest extent. The length of the project also may have caused a reduction in the engagement between the initial and closing surveys, although these delays were not solely scale-based (local and general elections delayed publication of the closing survey by five months).

Technical matters caused further issues: monitor 945 recorded no data from March – June 2024: a key period for the project. Whilst this did not affect the overall conclusions

drawn from the project, it limited the data available for our smallest study locality. Issues arose from attendees at Creating Clear Air Communities events co-oping the evening to platform personal beliefs, and anti-council sentiment too. The Bridport CCAC event – the best attended of the events - was significantly disrupted by members of the public interrupting speakers, asking questions off topic from that being discussed, platforming climate scepticism and “fifteen-minute city” beliefs. Others misunderstood the purpose of the event, limiting their take-away, and others aired personal grievances with wider council policy or decisions outside the remit of the event. There was also attendance from individuals with similar strongly held beliefs at the Maiden Newton event, albeit in smaller numbers with significantly less disruption caused. It is likely that those attending to understand the project and what information was meant to be conveyed would have their comprehension and understanding significantly disrupted by these interventions – a reflection being that a modified format to the event assisted in keeping items running to time and preventing interruptions at the Maiden Newton event.

Should future projects be carried out, careful consideration would be given to the above difficulties to prevent their recurrence. In hindsight, providing dedicated training and tools for a member of the project staff to install and maintain monitors would likely have been more efficient than employing other DC teams to undertake that particular area of work: often processes for procuring services took a matter of months due to the conflicting priorities. Relationships with the software provider for data analysis would need to be reviewed, as a loss of data for a key period of the project reduces the overall accuracy and validity of that collected. Further oversight would be needed over both surveys to ensure identicality of pre- and post- study questions, and an improved method of tracking interaction with promotional materials would be required to effectively measure the reach of the Burn Better campaign. The principal improvement to move conclusions from correlative to causal would need to be some form of speciation for the PM pollution encountered at study locations. This would allow better conclusions to be drawn as to the efficacy of any project looking to affect a behaviour, as the reliability of self-reporting is known to be less accurate (as individuals may answer how they think they “should” answer, rather than how they generally do). Statistical comparison of data sets is also necessary to progress understanding of the impact of the differences in weather, and the significance of the difference made by the campaign compared to background and AURN monitors.

Financial Performance

Financial information for the project is provided in *Table 2* below.

High Level Financial Summary				
	£ RDEL Defra grant	**£ CDEL Defra grant**	**£ Match Funding**	**£ Total**
Original application values	£3,000 printing and posting £500 venues £500 social media £2,000 decommissioning Total £6,000	£44,222	JM@50 hrs BFJ@180 hrs DN@20 hrs KD@40 hrs Total £22,620	£72,842
Total planned spend to date	£6,000	£44,222	£22,620	£72,842
Total actuals spend to date	-£6,614.4	£2,497	£16,084	£11,966.

Signatories

This report has been reviewed and cosigned by:

Sam Crowe	Director of Public Health
Graham Duggan	Head of Service for Community and Public Protection
Janet Moore	Service Manager for Environmental Protection
Darren Naraine	Team Leader for Environmental Protection

Appendix 1: Project Submission Documents

APPENDIX B: AIR QUALITY GRANT 2021/22 SUBMISSION SUMMARY
LA Name: *Dorset Council*

Please provide a summary of your submission on this form and attach it in the Online Technical Questionnaire. Please limit the summary to the text box provided.

The amount of grant funding requested is **£53,339.40**, with 81% of this being capital and 19% revenue (as broken down in the finance table provided). The cost of the wider project is £59,876, with the remainder being provided by Dorset Council as match funded staff costs.

The objective of the project is to increase the level of knowledge of $PM_{2.5}$ and ultimately reduce $PM_{2.5}$ emissions by changing behavioural attitudes to solid fuel burning. There is increasing local public concern around $PM_{2.5}$ in Dorset, and it is recognised that currently there is little information in relation to current concentrations, how concentrations vary across the County and the magnitude of contributions from different sources relate to the overall emissions. The project will use a combination of additional monitoring, and a public awareness programme to achieve these objectives.

Although the project will be implemented solely by Dorset Council, it will build on monitoring already underway by Public Health, thus furthering collaborative working across disciplines.

The main benefits from the project relate to reduced emissions from solid fuel burning, but also awareness raising more generally. Reduced emissions should ultimately reduce pollutant ($PM_{2.5}$) concentrations within solid fuel burning areas, and therefore improve health, but this will not be quantifiable or measurable.

It is also anticipated that the public awareness work will be built on in the future (if funding allows) and expanded to a more ambitious, and potentially regional awareness campaign in line with public health priorities. This project will test out messaging, and methods of awareness raising in a cost-effective way.

Q04 Strategic Alignment

The objective of the project is to increase the level of knowledge of $PM_{2.5}$ and ultimately reduce $PM_{2.5}$ emissions by changing behavioural attitudes to solid fuel burning. There is increasing local public concern around $PM_{2.5}$ in Dorset, and it is recognised that currently there is little information in relation to current concentrations, how concentrations vary across the County and the magnitude of contributions from different sources relate to the overall emissions. The project will use a combination of additional monitoring, and a public awareness campaign to both increase knowledge and provoke behaviour change.

The application will deliver against the first objective as set out in the tender documentation, paragraph 1.1.1, in particular by improving '*knowledge and awareness of air pollutant emissions and/ or concentrations*'. The project will improve knowledge and information about $PM_{2.5}$, in relation to concentrations and sources across Dorset, and outline the steps that can be taken by individuals to reduce their impact on $PM_{2.5}$ from solid fuel burning. The project will also respond, to some extent, to increasing local concern around $PM_{2.5}$.

Evidence, including that set out in the WHO Global Air Quality Guidelines[1], suggests that particulate matter is the principal driver of chronic human health effects relating to air pollution. PM_{10} can penetrate into the upper airways, while $PM_{2.5}$ can penetrate deeper into the lungs. Both fractions contain much smaller particles which, although they have very little mass, are far more numerous and can penetrate all areas of the lungs and even pass into the bloodstream, or directly into the brain. The impact of air pollution on health varies, depending on the pollutants present, the time of exposure and the existing health of the person. However, black carbon and ultra-fine particles, both related to combustion sources, have been identified by WHO as being of particular concern.

National Policy

The Clean Air Strategy sets out a wide range of actions by which the UK Government will seek to reduce pollutant emissions and improve air quality. Actions are targeted at four main sources of emissions: Transport, Domestic, Farming and Industry. The Strategy highlights that emissions to air from solid fuel use are significant. Burning wood and coal in open fires and stoves makes up 38% of the UK's primary emissions of fine particulate matter ($PM_{2.5}$), and is, therefore, a potentially significant source of primary $PM_{2.5}$ which Dorset Council could address. However, activity data relating to domestic burning, such as the amount and quality of fuel used, frequency of burning or number of homes with solid fuel stoves or fireplaces, are known to be highly uncertain, especially at a local level.

The Strategy contains a number of actions to be implemented at national level to reduce emissions from this sector, including:

- Legislating to prohibit the sale of the most polluting fuels;
- Ensuring that only the cleanest stoves are available for sale by 2022;
- Making changes to existing smoke control legislation to make it easier to enforce;

[1] World Health Organization, 2021.WHO global air quality guidelines: particulate matter ($PM_{2.5}$ and PM_{10}), ozone, nitrogen dioxide, sulfur dioxide and carbon monoxide. https://apps.who.int/iris/handle/10665/345329

- Giving new powers to local authorities to take action in areas of high pollution;
- Working across government to look at opportunities to align work on air quality, clean growth and fuel poverty; and
- Develop a dedicated communication campaign targeted at domestic burners to improve awareness of the environmental and public health impacts of burning.

In February 2020, Defra published the response to its consultation on "cleaner domestic burning of solid fuels and wood". This has proposed legislation[2] to phase out the sale of traditional house coal over a two year period and to ban the sale of unseasoned or wet wood in volumes of less than 2m^3. Sale of anthracite (smokeless coal) or manufactured solid fuels will continue, with a requirement that they conform to a standard of no more than 2% sulphur and emit no more than 5g smoke per hour. While a robust direct comparison is not possible (different metrics, different sampling techniques etc), these standards are considerably higher (in terms of sulphur content and allowed PM emissions) than those for road fuels and vehicle emission standards.

At the same time, the Environment Bill is proceeding through Parliament. This proposes changes to the Clean Air Act 1993 which expand and clarify the application and enforcement of Smoke Control Areas (SCAs). The Bill also requires that the Government set an annual mean target for $PM_{2.5}$, as well as long term environmental targets.

The project therefore aligns with the Clean Air Strategy, the emerging Environment Bill and represents a project which will improve the evidence base in relation to $PM_{2.5}$ concentrations and sources within Dorset, and also begin to improve local air quality by delivering air pollutant emissions reductions from solid fuel burning, critically, with the ability to share this best practice. It is judged that this project will form the basis for future more ambitious behavioural change projects, providing a platform from which to better communicate actions which the public can take to reduce $PM_{2.5}$ emissions.

Local Air Quality Management in Dorset and wider strategic alignment

Prompted by the Review and Assessment process, Air Quality Management Areas (AQMAs) have been declared in Chideock in 2007, and High East Street, Dorchester in 2009. In Dorchester, the annual mean objective for NO_2 has been met at all monitoring locations both within and outside of the AQMA since 2015. Significant exceedances of the annual mean NO_2objective remain in Chideock. Monitoring suggests that concentrations are reducing, however, there are still exceedances at properties to the west of the village centre, where the road is on a steep gradient and there are properties very close to the road. There is also significant public concern within Chideock with regards to air quality.

Work to improve air quality in Chideock, in conjunction with Highways England, is ongoing and the Council is in the process of updating its air quality action plan, with a consultation draft having been published. The plan notes that, although air pollution policy is currently driven by exceedances of the NO_2 annual average objective, the greater health impact of $PM_{2.5}$ is acknowledged. This is because at present the legal limits for $PM_{2.5}$ are higher than the World

[2] The Air Quality (Domestic Solid Fuels Standards) (England) Regulations 2020 (https://www.legislation.gov.uk/ukdsi/2020/9780348210194)

Health Organization's (WHO) health-based guideline limit (both existing and previous) and are met in most places in the UK. However, as the WHO recognises, the health evidence shows that there is no safe level of $PM_{2.5}$, so any concentration-based target for $PM_{2.5}$ does not fully reflect the health evidence. Measures to reduce NO_2 will also largely reduce traffic related PM, although measures are likely to be focussed on traffic related sources only. For this reason,

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the Action Plan takes a more strategic approach and also contains measures which should help in reducing concentrations of PM, such as reducing emissions from solid fuel burning. This project therefore also aligns with the local strategic direction of the Council on air quality to work towards reducing emissions more generally across the district.

The Council notes that its priorities are, in collaboration with others, to work *in pursuit of the achievement of the air quality objectives*, and also to reduce emissions more generally across the district through collaborative working with other policy areas such as transport, public health, planning and work underway to tackle the Climate Emergency declared in Dorset. By taking this more strategic approach, air quality and the associated health outcomes should improve more generally across Dorset.

Dorset has seen an increase in public awareness on air quality. Particularly in Chideock, residents are highly active in relation to communicating their concerns. This concern spans both the objective exceedance for nitrogen dioxide, caused predominantly by traffic on the A35, as well as $PM_{2.5}$ for which there are very little data available. The Council understands the need to generate quantified data on $PM_{2.5}$, and at the same time reduce emissions of $PM_{2.5}$. Public health colleagues within Dorset also have a keen interest in $PM_{2.5}$ and ongoing partnership working will be further enhanced through this project, which will build on work already undertaken by Public Health on measurements of $PM_{2.5}$.

Dorset Council have consistently submitted comprehensive local air quality management reports to Defra including reporting on actions to improve air quality. This project will be included in their LAQM reporting requirements as a further measure.

During and following implementation of the project, the Council will make full use of its existing communications networks to disseminate the results. Dorset Council proactively collaborate with other local authorities in the area, in particular Bournemouth, Christchurch and Poole Council, to share best practice in local air quality monitoring, reporting, analysis of data and implementation of solutions. Dorset Council will also disseminate the information with residents, using existing networks to form the basis for locally driven action. More widely, Dorset Council will provide Defra with a succinct case study for inclusion on its website, which will clearly set out the impacts of the project and how it can be implemented elsewhere, and would also be willing to present it as part of an air quality event (for example a workshop, or other IAQM event IAPSC etc). It is judged that this project could, over time, make a relatively large impact on solid fuel burning emissions, which are a large proportion of locally derived $PM_{2.5}$ emissions, and therefore resulting emissions and concentrations reductions. The project will be implemented in the next year, with any resulting emissions reductions occurring in the longer term. It is a project which could be easily implemented across a wider network of local authorities, with wider benefits for air quality across those areas.

Q05 Delivering Air Quality Benefits and Social Value Why is the Project Needed?

Evidence, including that set out in the WHO Global Air Quality Guidelines[3], suggests that particulate matter is the principal driver of chronic human health effects relating to air pollution. PM_{10} can penetrate into the upper airways, while $PM_{2.5}$ can penetrate deeper into the lungs. Both fractions contain much smaller particles which, although they have very little mass, are far more numerous and can penetrate all areas of the lungs and even pass into the bloodstream, or directly into the brain. The impact of air pollution on health varies, depending on the pollutants present, the time of exposure and the existing health of the person. However, black carbon and ultra-fine particles, both related to combustion sources, have been identified by WHO as being of particular concern.

Particulate pollution has health effects even at very low concentrations – indeed no threshold has been identified below which no damage to health is observed. For this reason, $PM_{2.5}$ standards (the exposure-reduction approach) have been set to reduce population exposure in addition to air quality objectives which are aimed at hotspots. It is understood that Defra is considering the development of a Population Exposure Reduction Target under the Environment Bill, potentially including a "continuous improvement" obligation for Local Authorities to help drive down population exposure to $PM_{2.5}$.

Dorset Council's options for action on $PM_{2.5}$ are limited and need to be supported by relevant local information. Available evidence is notoriously uncertain for domestic solid fuel use, particularly in terms of activity levels (i.e., what proportion of households are burning sold fuel, what fuel and how often they are burning it, and in what appliances).

There is a very wide variation in emissions from wood burning, with a range of factors influencing the amount of pollution which is produced[4]. The two most significant factors that increase emissions of particulate matter are the moisture content of the wood and the appliance which is used (open fire, stove etc). Modern stoves circulate air within them in a way which significantly increases the efficiency of the combustion process, resulting in a cleaner burn than open fires. In open fires, the air flow is largely uncontrolled and this increases the extent of incomplete combustion. When trees are felled, they contain as much as 70% water, depending on the species. When wood with high moisture content ("wet wood") is burned, the emissions of particulate matter are far higher than when burned dry. The heat output is also significantly reduced and gives rise to the build-up of sooty deposits on the inside of the stove and chimney, increasing the risk of chimney fires.

Wood burning could be either as a primary heat source (potentially in areas of higher social deprivation) or a secondary heat source, suggesting that most wood is burned for its aesthetic value. However, there are no data on the proportion of the population using solid fuel for either a primary or a secondary heat source. In Bristol, survey work undertaken as part of the ClairCity project[5] showed that for the great majority users in the Bristol area, wood is a secondary heating fuel, with the primary fuel being gas or, in some cases, oil. This suggests that

[3] World Health Organization, 2021.WHO global air quality guidelines: particulate matter (PM2.5 and PM10), ozone, nitrogen dioxide, sulfur dioxide and carbon monoxide. https://apps.who.int/iris/handle/10665/345329

[4] Call for Evidence on Domestic Burning of House Coal, smokeless Coal, Manufactured Solid Fuel and Wet Wood (January 2018)

[5] Further details of this four year European Project can be found at http://www.claircity.eu/bristol/ Survey data obtained from Bristol City Council.

these users could therefore be amenable to a behavioural change intervention. However, it is recognised that in a rural area, there may be a greater proportion of the population using solid fuel as their primary heat source.

Dorset is a rural area, which does not have any Smoke Control Areas declared. Anecdotally, there are likely to be locations where solid fuel burning (particularly wood) is high, but there is very little evidence on levels of wood burning. This project will increase the evidence base on $PM_{2.5}$ through a

monitoring campaign, as well as provide information to the public on solid fuel burning in order to bring about changes in behaviour.

Description of the Project

The objective of the project is to increase the level of knowledge of $PM_{2.5}$ and ultimately reduce $PM_{2.5}$ emissions by changing behavioural attitudes to solid fuel burning. There is increasing local public concern around $PM_{2.5}$ in Dorset, and it is recognised that currently there is little information in relation to current concentrations, how concentrations vary across the County and the magnitude of contributions from different sources relate to the overall emissions. The project will use a combination of additional monitoring, and some aspects of behaviour change to achieve these objectives. These are described in more detail below.

Work package 1: Monitoring

The particulate monitoring will be undertaken using sensors which will provide short term concentrations and are cost effective enough to have multiple sites in order that a comparison of different locations will be possible. There are a variety of low-cost sensor systems that are commercially available, the majority of which are based on sensor technologies provided by Alphasense. For this project, the AQMesh small sensor systems (pods) are proposed. These samplers are also being used in other work monitoring background $PM_{2.5}$ across Dorset. In addition to $PM_{2.5}$, the sensors will also measure PM_{10} and PM_1. PM is measured using a light-scattering optical particle counter (similar in nature to the Palas Fidas). The AQMesh system has been installed and successfully operated in Breath London[6], one of the largest city-wide hyperlocal networks, and is a proven technology.

The sensors are provided as "factory calibrated" – prior to shipping from the manufacturer, each individual sensor is characterised in terms of sensitivity and offset. These data are unique to each sensor and are utilised by the AQMesh processing algorithm to apply corrections related to crossinterferences and environmental conditions. Factory calibration should be sufficient for this project, but it is not sufficient to ensure the accuracy of measurements, particularly over a period of longer than 12 months.

It is possible to operate the pods from solar and battery power. For this project it is envisaged that solar power will be used for ease of installation. It is envisaged that the AQMesh pods will be fixed to items of street furniture, such as a traffic sign or lighting column. The pod has a dimension of 225mm x 220mm x 235mm and weighs 2kg. If necessary, installation can also take

[6] www.breathelondon.org

place at building facades, railing and posts using "stand-off" brackets to avoid interactions with surfaces close to the pod.

AQMesh pods require minimal maintenance in normal use, and they are designed to cope with harsh outdoor conditions for long periods. It is, however, possible that a sensor may fail and will require replacement. For PM, this will entail the pod being sent back to the manufacturer.

Daily QA/QC checks will be carried out in order to identify any equipment failures. Any equipment failures notified on the day of the identified failure, subject to weekends and public holidays. Confirmation will also be provided of actions taken to rectify repairs on the day following the repair, subject to weekends and public holidays.

Proposed Monitoring Strategy

The monitoring strategy has been designed to make best use of the features of the AQMesh sensors; in particular their size, which provides flexibility regarding site selection, and their ability to provide high time-resolution measurements. This latter feature makes the optimum network design different to that for lower time-resolution instruments because it allows the analysis of data from multiple sites,

alongside appropriate meteorological measurements, which can identify individual sources or sourcegroups.

The monitoring strategy has the following broad aims:

- To provide an understanding of key emission sources of $PM_{2.5}$ in Dorset; and
- to provide an indication of how concentrations across Dorset compare against relevant air quality standards.

As the AQMesh is not a reference sampler, the measurements can only be considered indicative with respect to strict compliance assessment, but this does not detract from their ability to inform a picture of concentrations and across Dorset, as was seen in the Breath London network.

The monitoring strategy is based around the installation of six AQMesh pods for 12 months. Precise siting locations will be agreed at the outset of the project, but it is considered that the current AQMesh pods located at schools across Dorset will provide regional background concentrations. Three of the additional pods will be located in areas where it is thought that high solid fuel burning occurs, and three pods will be located at roadside locations. In order to identify potential locations of high solid fuel burning, HETAS (Heating Equipment and Testing Approval Scheme) registration information will be used, which will be obtained from building control within the council. Data relating to new installations are available from HETAS, which is the only specialist organisation approving biomass and solid fuel heating appliances, fuels and services. However, as it is not a requirement to register a new installation with HETAS, this will not cover all installations but will provide a good indication of where installations are clustered. Dorset has a number of off gas areas (nongasmap.org.uk) which will also be included in the decision making process.

Analysis of Data

Data are provided by Acoem by way of an app, which can then be manipulated by other software packages such as excel or R. The analysis of the monitoring data will be contracted out. The analysis will look for correlations of the sites against available meteorological data to show concentrations in different wind directions, differences between the site types and therefore likely contributions from specific sources such as traffic (i.e., if the concentrations are highest when the wind is in the direction of the road, this infers the additional contribution of the road). Analysis of temporal variation will also be undertaken, for example whether there are times of the day or week where concentrations are highest (at solid fuel burning sites, this may equate to particularly cold periods, or weekend evenings during the winter, roadside sites may see an increase at peak hours or during school holidays). The report will cover the 12-month monitoring period of monitoring. ***Work package 2: Public Awareness Raising in Relation to Solid Fuel Burning***

This work package will be implemented alongside monitoring. It will complement work being undertaken at a national level, for example the Burn Better information campaign, launched by Defra in 2020 to raise awareness about the impact of domestic burning and reduce air pollution from domestic burning. This campaign encourages solid fuel users to make positive changes to their burning habits, including using better quality fuels, getting their chimney swept or upgrading their appliances. Advice on wood burning stoves highlights that reducing emissions will also provide other benefits to the householder. Burning dry wood will not only reduce emissions but maximise efficiency and reduce the risk of chimney fires. Government information contains advice around the following areas:

- Fuel use; considering burning less, buying 'ready to burn' fuel (this logo will provide a guarantee of good quality dry wood), season freshly chopped wood before burning (consider using a moisture meter), using approved solid fuels instead of house coal and not burning treated wood or household rubbish; and
- Maintenance; service your stove annually and get your chimney swept.

It will also use other available materials and toolkits including that produced by Global Action Plan. These messages will be localised, and disseminated using a number of methods including:

- The local media, in particular the Dorset Echo;
- Engagement directly with local residents groups; • Leaflets at relevant Council offices; and • Social media campaigns.

Dorset Council's communication and press office team will be utilised in this part of the project and staff time for the communication officer has been included.

As solid fuel burning is largely a winter issue, the materials will be prepared prior to the end of August 2022 with campaigns to start in September 2022.

Work Package 3: Survey of Behaviour

Existing structures will be used to undertake a short online survey of solid fuel use. For example, Dorset Council has existing contacts and structures for engaging with the public, which can be utilised for this package of work. Questions to be asked will include whether the respondent undertakes any solid fuel burning, and if so, what appliance they use, what fuel they

use, and how often they use it. Questions about the awareness of the impact of solid fuel burning will also be included.

Work Package 4: Evaluation and Knowledge Transfer

A final report will be provided which will draw together findings from pollution data, the analysis, the public awareness raising work and where relevant, provide recommendations for future work and resources required. This report will provide the basis of the evaluation, and will provide the evidence on which knowledge transfer, particularly to other local authorities, will happen.

It is difficult to quantify the outcomes of projects aimed at behavioural change. For interventions that are aiming to change travel behaviour, there is some literature which provides an indication of the sorts of modal shift which might be expected from a particular measure (although the actual outcome will be dependent on a wide variety of factors which are often difficult to take into account). There are, however, much fewer studies examining the association between interventions to reduce solid fuel burning. At this stage, there are no data on the current use of solid fuel burning in Dorset. It is therefore impossible to provide any quantifiable figures on either current levels of emissions/ concentrations of $PM_{2.5}$ or the impacts of a public awareness campaign. It is, however, hoped that by undertaking this project, this lack of data will improve in the future.

Expected secondary effects

There will be a number of wider positive benefits of measures to be implemented on solid fuel burning in Dorset. Encouraging correct stove and fireplace use will also have health and safety benefits (lower fire and carbon monoxide poisoning risks). Lower wood fuel use could result in increased gas use which may result in an increase in greenhouse gas emissions. However, for "casual" wood users this impact is likely to be minimal. Where wood is used as a primary heat source, users could switch to gas heating (higher GHG emissions) or to electrical heating (including solar and Air Source Heat Pumps) which has the potential to be zero carbon, although there may be issues around fuel poverty.

Work being undertaken through the Dorset Action Plan on Renewable Energy, and that for Buildings (both being undertaken in response to the Climate Emergency) will be supported, to reduce emissions of $PM_{2.5}$ from the domestic, and commercial, sector across the Dorset area. These include projects to both maximise energy efficiency and increase renewable energy in these sectors. Projects being undertaken by Low Carbon Dorset are assisting in delivery of these aims.

Social Value

Although monitoring $PM_{2.5}$ *per se* is unlikely to bring direct benefit to the local economy and community, interventions such as the public awareness campaign are likely to bring benefits to the community in terms of environmental improvement and health, which will have knock on effects on the local economy (reduced costs in relation to the health service, less days missed from work, increased spending within the local economy as the population is healthier and more affluent). The outcome may also impact on social inequality, as the worst air quality is

often in the least affluent areas. The awareness campaign will ensure that vulnerable groups, including low income households are not affected in an inequitable way.

Q06 Value for Money

Grant Funding and Financial Breakdown

The amount of grant funding requested is **£53,339.40**, with 81% of this being capital and 19% revenue (as broken down in the finance table provided). The cost of the wider project is £59,876, with the remainder being provided by Dorset Council as match funded staff costs. This will cover project managing and implementing the monitoring programme, providing the public awareness campaign on solid fuel burning (including an input from the comms team), managing the analysis of the monitoring programme and undertaking a survey of solid fuel burning behaviour. The main capital cost is the monitoring programme, which will build on equipment already available within Dorset Council (public health currently run 6 AQMesh analysers which will be recalibrated with new PM sensor cartridges) with a further 6 pods being added to the programme for 12 months at roadside and solid fuel burning locations. The project budget also includes an evaluation of the project and knowledge transfer, which will be undertaken by staff within Dorset Council. In line with the grant programme, Dorset Council will include £6,536 in staff costs (minimum) which equates to 8 weeks spread over the Environmental Protection Team and 3 weeks of a G10 Comms officer (approximately 1 week to undertake the public awareness work, 1 week to undertake a survey on solid fuel burning behaviour and 1 week to undertake the evaluation of the survey and public awareness work).

Staff costs have been calculated by combining salary and on costs and dividing by hours worked per year. The team includes Coralie McGowan who has been included as she is responsible for air quality within Dorset, has wide ranging experience in both monitoring and engagement with the public and has long standing working relationships with residents' groups. Coralie will therefore be able to undertake many of the tasks with minimal supervision and hence provide excellent value for money. However, an average of the whole team has been costed, in order that Environmental Health Officers, Technical Officers and Janet Moore (Service Manager) can also be involved providing the most cost-effective cover for different tasks.

The monitoring will be contracted out and hence costs for that element are based on quotes from the AQMesh supplier obtained while writing this grant application. Analysis of the monitoring will also be contracted out, and again a ballpark quote has been obtained.

The draft financial breakdown is as follows. Exact costings will be known once the contract has been tendered in line with Dorset Council Procurement rules:

Element of Project	Revenue Cost	Capital Cost	Match Funding	Total Cost of Grant Applied for
Work Package 1 - Monitoring	£1,028.60	£40,725.00	£1,028.60	£41,753.60
Work Package 1 - Monitoring Analysis	£8,500.00			£8,500.00
Work package 2 - Public Awareness Campaign	£1,028.60		£1,835.94	£1,028.60

Work package 3 - Survey of behaviour in relation to solid fuel burning	£1,028.60		£1,835.94	£1,028.60
Work package 4 - Monitoring and Evaluation	£1,028.60		£1,835.94	£1,028.60
Total	**£12,614.40**	**£40,725.00**	**£6,536.42**	**£53,339.40**

Procurement Strategy

Dorset Council's procurement strategy sets out the Council's approach to procurement activity to ensure that it was effective and represented the best value to the residents of the Council's local authority area. This overarching Corporate Procurement Strategy sets out the framework within which all procurement is to be conducted throughout the Council. By acting within this framework best value for money will be delivered, and funds will be spent in a correct, transparent and effective way.

Benefits arising from the Project

The main benefits from the project relate to reduced emissions from solid fuel burning, but also awareness raising more generally. Reduced emissions should ultimately reduce pollutant ($PM_{2.5}$) concentrations within solid fuel burning areas, and therefore improve health, but this will not be quantifiable or measurable. It is, however, considered that this project is a very costeffective way of delivering improvements.

Value for Money

It is considered that the project provides an opportunity to build on work already underway in Dorset, by way of the 6 current AQMesh pods at background locations within schools; these data will be included in the data analysis and replacement cartridges will ensure that the data is of the highest quality, hence providing a cost-effective way to get the most of the additional monitoring. External contractors will be procured to undertake the data analysis and provide an indication of correlations of the sites against available meteorological data to show concentrations in different wind directions, differences between the site types and therefore likely contributions from specific sources such as traffic or solid fuel burning. By using specialist air quality consultants, this will ensure that the maximum amount of the information will be gained from the data collected, for use both in responding to resident concerns and providing background for future work. Consultants will deliver the analysis in a much more cost-effective way than could be undertaken in house.

Although not quantifiable, emissions (and resulting concentration) improvements are likely to be widespread across Dorset, hence providing health benefits across a wide geographical area.

Q07 Deliverability

Janet Moore (Service Manager Environmental Protection) will have overall responsibility for project delivery, including procurement. She has extensive prior experience of delivering projects to time and budget. These include delivering the regulatory enforcement requirements associated with the London 2012 Olympics and Para-Olympics at the Sailing venue in Weymouth and Portland including LOCOG specifications on advertising and trading. More recently she has project managed projects addressing local health inequalities and measures to improve community health, welfare and safety. Resource (in terms of time) has been allowed for in the budget and internal project management tools will be used to ensure that the project is delivered to both time and budget. Janet will be assisted by Coralie McGown who will liaise closely with the chosen contractors and provide project management assistance. Coralie will be starting an Associate Project Manager Apprenticeship (Level 4) in 2022, which will also provide background for this project. Progress with the monitoring aspects of the project will be reviewed on a monthly basis, although contractors will be reviewing data more frequently (issues with data collection will be flagged daily). Any concerns about delivery within the timescale set out will be communicated immediately to Defra (via phone or email), and will also be reported within the quarterly reporting process. Annex B, staff costs spreadsheet provides an indication of the resources committed to delivering the project. This assumes 40 days of input from the Environmental Protection team, which has been costed based on an average hourly rate of £26.51, which will include time spent on managing all aspects of the project. The project will be delivered within the Environmental Protection team, without the need for external partners. This does not, however, mean that collaboration will not occur both within Dorset Council (a key stakeholder being public health) and with neighbouring authorities such as Bournemouth, Christchurch and Poole Council. Likewise, although no formal public consultation is included as part of the project, the key requirement of the project is public awareness raising, and it is thought that the consultation being undertaken for the recent review of the Air Quality Action Plan will be built on, and that members of the public will be surveyed in relation to solid fuel burning activity.

The following represents a timeline for all stages of the project, which is also summarised in a Gantt Chart. This may need to be refined as the project proceeds. This therefore represents a draft project plan.

WP1: March – May 2022: Procurement period, identifying locations of monitoring and gaining relevant permissions

This period of time will include the procurement process for monitoring, the specification of exact locations (which will be based on a number of factors such as for the solid fuel burning sites, the number of HETAS registrations or whether the village is off gas or not). This time period will also be used to ensure that any permissions are in place (for example for mounting the units on lampposts).

WP1: 1 June 2022 – 31 May 2023 Monitoring period – indicative timescale

12 months of monitoring will be undertaken to ensure that all seasonal variations are accounted for, and that a full analysis at the end of the project can be undertaken. Any issues with data loss or drift are flagged up automatically by the supplier, but Dorset Council will review monitoring data on a monthly basis.

WP2 & WP3: June to August 2022: Public Awareness Campaign Design and Survey Design

The public awareness campaign will be planned, utilising existing information from Defra and other local authorities. The methods by which the information will be disseminated will also be finalised. A short survey will also be planned to coincide with the start of the campaign.

WP2 & WP3: September to December 2022: Public Awareness Campaign and survey undertaken just prior to and during peak Solid Fuel Burning season

The public awareness campaign and survey will be implemented as per the planned process.

WP1: June 2023 to July 2023 Monitoring Data Analysis

The procurement process for the analysis of the monitoring data will be commenced.

WP1: June 2023 to July 2023 Monitoring Data Analysis

Following 12 months of monitoring the analysis as outlined in Q05 will be undertaken and written up into a report which is public friendly and can be used for knowledge transfer.

WP4: July 2023 to August 2023: Evaluation Process

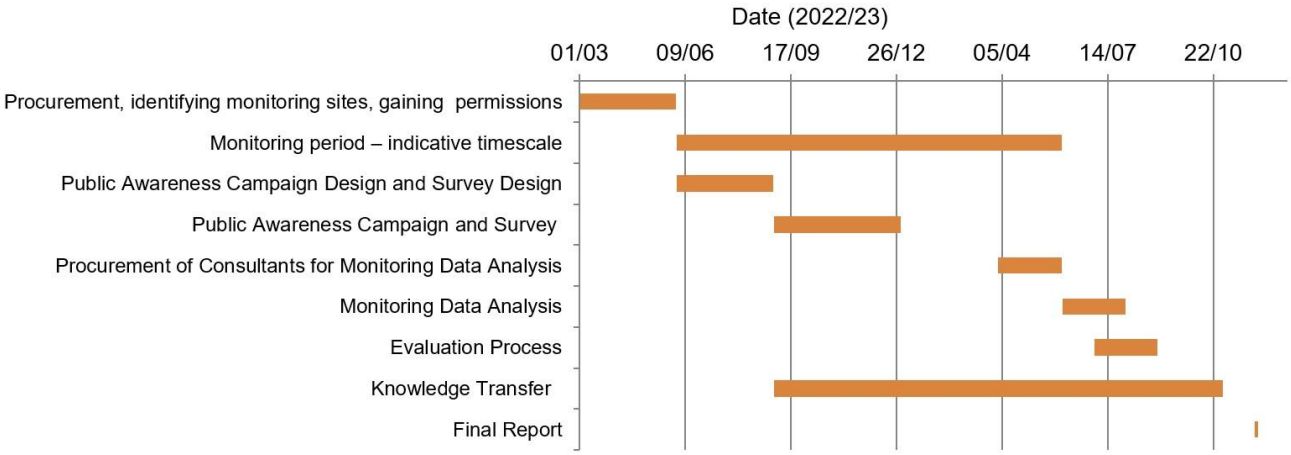
The evaluation process will entail an evaluation of the project delivery, as well as the project outcomes (in particular the analysis of monitoring data, but also any feedback from the public awareness work and success in getting articles in the local press etc). The evaluation report will be undertaken by the Council.

WP4: August 2023 to September 2023: Knowledge Transfer

Knowledge Transfer will be undertaken over the course of the project where opportunities arise, but mainly at the end of the project once the final report has been written evaluating the outcomes. However, lessons learnt can be shared prior to this, and opportunities will be taken to do this. Coralie McGown will be responsible for knowledge transfer, which may also go on longer than this project plan suggests if further opportunities arise.

August 2022 – December 2023: Reporting to Defra

Quarterly reports throughout the time period of the project and final evaluation report, following completion of the monitoring.



Assumptions which delivery of the project relies on and associated Risks to delivery of the project

This project relies on a smooth delivery of monitoring, which will run alongside a public awareness campaign and survey of residents. Close working with the communications team within Dorset Council will ensure that delivery happens to the timescales set out above. Another assumption on which the project relies is effective project management. This risk to delivery is mitigated by naming Janet Moore as responsible for the project. Janet is experienced in implementing projects to time and budget and will also ensure that there is political support for delivery.

A further risk is in staffing holiday periods, change of staff, or current staff not having enough time to implement the project fully. This risk will be mitigated through effective project management (to ensure the project works around holidays etc.) and ensuring that there is enough overlap if staff changes occur within the project. Coralie works closely with Janet and can cover the overall project management role should Janet either be on leave, or be unavailable for an extended period of time.

Risk Register

The following table outlines the main risks to the project, the probability of occurring and the proposed mitigation.

Risk	Risk to Project	Probability	Mitigation
Technical issues with monitoring	Project not implemented in full	Small	Monitoring supplier offers warrantee and there are processes in place to ensure

			that technical issues are flagged up automatically.
Requirement for licenses for mounting monitoring on lampposts	Would delay project implementation	Medium	The process will be started as soon as Defra announce successful grant applicants
Project Management	Ineffective project management would delay project implementation	Small	Well qualified staff involved, procurement of suitable contractors with experience
Unavailability of key members of staff due to personal circumstance, injury or illness	Delay to project implementation	Small	Other qualified members of staff available, in particular Janet Moore and Coralie McGown work very closely together.
Key member of staff position becomes obsolete	Delay to project implementation	Medium	Other qualified members of staff available.
Covid-19 restrictions causing potential delay to the project	Delay to implementing monitoring, public awareness work delayed or requires different way of engaging with public	Medium	Contingency in time if elements of the project need to be postponed.
Poor performance of contractor	Quality of delivery	Small	Use of contractors who have undertaken work within Dorset and therefore have a track record with the Council. Robust procurement process

Dorset Council's Anti-Fraud, Corruption and Bribery Strategy sets out Dorset Council's commitment to tackling fraud, corruption and bribery. It specifies the actions the Council promotes to prevent such acts, and sets out the roles and responsibilities of Councillors and employees in minimising the risk of fraud, corruption and bribery and reporting any suspicions they have. The Strategy provides a 10 step response plan for any issues of concern involving Council employees. Dorset Council is committed to achieving high standards of integrity and accountability; such, the Council's Anti-Fraud, Corruption & Bribery Strategy sets out a zero tolerance approach to any such acts and records the Council's clear commitment to deal with any cases robustly.

Once the project has concluded, the AQMesh pods will still be available to the Council. As just the sensor cartridges can be changed they will become and even more cost effective method of monitoring. Therefore $PM_{2.5}$ monitoring is likely to be an ongoing activity for the council. It is

also anticipated that the public awareness work will be built on in the future (if funding allows) and expanded to a more ambitious, and potentially regional awareness campaign in line with public health priorities. This project will test out messaging, and methods of awareness raising in a cost-effective way.

Q08 Monitoring, Evaluation and Knowledge Transfer

Confirmation of Defra's reporting requirements

Dorset Council will comply with all reporting requirements including quarterly reports, final report, finance reconciliation and the appropriate use of the Defra logo to acknowledge receipt of funding from Defra.

The final report will be made available for inclusion on the Air Quality Hub and will also be made available to interested parties, which are likely to include neighbouring local authorities, elected members and residents groups.

Monitoring and Evaluation

A monitoring and evaluation plan will be written at the outset of the project and will include assessing progress against the project plan included in Q05, in particular the following key deliverables:

- Key target dates for the work package 1 on Monitoring (in relation to commencement of the monitoring in particular);
- Key target dates for the work package 2 on Public Awareness work to ensure that it is correctly timed for winter sold fuel burning;
- Delivery of defra's reporting requirements; and
- Evaluation of the behavioural change.

The project will be judged on the implementation of both work packages within the timeframe outlined in the initial Project Plan as well as the potential outcomes of the programme in terms of behavioural change. Where delays have occurred in the project plan, the reasons for this will be detailed in the evaluation of the project, in order that this information can be used for better planning of future projects.

The project will be tracked through direct communication with the contractors on a regular basis (regular update calls at key points in the project plan will be factored in to discuss progress). The Project Manager will use excel as a tasks and issues tracker to ensure successful delivery of the work packages in terms of both time and budget. In terms of reporting this progress, Quarterly Reports will be issued to Defra which will include the following:

- Any changes to the project which have arisen in the implementation phase;
- A brief description of the progress in relation to key milestones and timescales of the Project Plan.
- Issues and risks faced;
- Project outputs and benefits;
- Financial performance against anticipated project spend; and • Any knowledge transfer activities either completed or planned.

A final report will also be issued which sets out the summary, the aims of the project and work undertaken, and will evaluate how successful the project has been. This will also include the knowledge transfer activities to both other local authorities and to Defra. The outcomes of the monitoring analysis will be appended to the final report. The final report will be completed

within 6 months of the project end and will highlight all best practice and lessons learned and include a case study which could be published on the Air Quality Hub, to provide a succinct summary for local authorities wishing to implement a similar project. Other observations to inform and help other local authorities will also be included.

The evaluation has been fully costed in the figures outlined in Q06 and will be undertaken by the Council.

How data and evidence will be shared with the public and stakeholders

The outcomes of the project will be shared with the public through a variety of methods. The outcomes of the monitoring study (which will be written up and summarised in a report by the contractors) in particular will be of interest the public. Dorset Council will make the report available on line, will include an overview of the outcomes in LAQM annual reporting, but importantly will engage directly with residents groups through existing networks and meetings. Some of the benefits of this sort of engagement is in the Council being more proactive on air quality topic areas which are growing in public concern, but haven't traditionally been included in statutory work on air quality. Other benefits may be behavioural change for other sources of $PM_{2.5}$ (such as traffic), as people become more aware of the issues, and sources.

In terms of other local authorities, the outcomes of the project, particularly in relation to lessons learnt and best practice, will be disseminated initially to neighbouring authorities, for example Bournemouth, Christchurch and Poole Council. This will be undertaken through regular meetings, which include knowledge transfer on the agenda. It is anticipated that this dissemination of project outcomes could be undertaken via a short presentation. Where helpful, Dorset Council will attend any other meetings which are deemed useful for knowledge transfer to other local authorities. This may be through the Institute of Air Quality Management (IAQM), Investigation of Air Pollution Standing Conference (IAPSC) or other similar conferences. Budget has been included by way of staff time to cover this element of the project. If requested, Dorset Council will also speak to Defra directly about the outcomes of the project, for example at a local authority workshop event.

A critical stakeholder will be public health colleagues, who have already started undertaking some work on $PM_{2.5}$, and for which this work will build on monitoring units already in place at background sites at schools. It may be that the outcomes of this project can be build on by public health colleagues who will be kept informed through regular meetings and other engagement. It is also likely that public health colleagues may be able to assist in the dissemination of outcomes to the public and other local authorities, and this avenue will be explored.

In all cases (ie the public, public health and other local authorities) the key engagement will be at the end of the project, particularly when the outcomes of the monitoring are known and the analysis has been undertaken. However, all groups will be kept informed on the progress of the project, both through regular engagement (i.e., not specific to this project) and through the LAQM reporting process.

Appendix 2: Quarterly Reports

A copy of the final quarterly report is demonstrated here which is constituted of previous quarterly reports, i.e. the first report was added to by the second etc. Any or all of the quarterly reports may be provided to enquirers by the authors by reasonable request.

Quarterly reports were submitted until April 2024, when it was anticipated that the final quarter (to July) would coincide with the submission of this report. Due to local and national elections, this was delayed.

Air Quality Grant 2021/22 - Progress Report

Grant Determination Number 31/5979 and 31/5980

itt_9158 and itt_9157

Contents

Introduction

Reporting Requirements

In the Invitation to Apply for grants under the Air Quality Grant Scheme 2021/22, local authorities awarded a Grant are asked to provide progress reports on the supported project(s) after the grant has been paid to the authority. The form set out below should be used to report quarterly progress for the duration of the project in all cases.

A final progress report detailing the outcomes and evaluation of the project will be required within 6 months of the project reaching completion. Failure to submit a final evaluation report may result in Defra requiring repayment of Grant funding by the Recipient. This report must be presented in a format ready for publication. There is no set template for the final report, the type of evaluation will vary depending on the objectives set within individual projects, the outputs created, and the outcomes envisaged. As a minimum, the final report should set out:

- The project summary and aims.
- Work undertaken and an assessment of how work may have differed from the initial proposal.
- Whether this was a Sole or Joint Proposal and a review of the benefits and challenges of the chosen delivery model.
- An assessment on whether the project was effective and achieved its objectives and milestones.
- An assessment of how the outcomes of the project will be delivered or maintained longer term.
- Details of stakeholder engagement.
- Sharing of best practice or lessons learned.
- A financial breakdown of how the funding was used and a financial reconciliation of the funding awarded (NB this can be provided in the final report, or if the data is considered commercially sensitive, please provide as an annex marked “Not for Publishing”).

How to complete the quarterly report form

- **Section 1 – Project Overview**: Please enter contact details and complete the project summary details each quarter.
- **Sections 2 - Provide a brief description of the project, and Section 3 – Project air quality objectives**: Please complete in line with the proposal submitted to Defra at the time of application (September/October 2021).
- **Sections 4 onwards** – Please complete each quarter with relevant updates; you may add or remove quarters as relevant depending on the length of your project. These sections provide the opportunity to give an update on progress as well as any changes to the programme.
- The information in the report is cumulative so please add to previous quarterly responses and do not edit or delete them.
- If the project extends beyond 2 years, please insert new quarters as necessary and the RAG status table in section 5 should be duplicated to add additional quarters.
- Reports are due within 1 month of the end of each quarter. For example, the Quarter 1 report, covering activity up to the end of June, should be returned by the end of July.

- Please return completed progress reports to: Air.Quality@defra.gov.uk

1. Project overview

Guidance: *Please provide the Project and Contact Details lead, project status, and High level financial summary as requested in the tables below.*

Project and Contact details	
Lead Local Authority Name	Dorset Council
Project Partners	Public Health Dorset, Highways
Our Ref: ecm	Please enter details included in your award letter
Key Contact Details: **Name, position, email, telephone**	*Redacted*
Copy list	If any emails should be cc'd in communications, please enter the email address here.

High Level Financial Summary				
	£ RDEL Defra grant	**£ CDEL Defra grant**	**£ Match Funding**	**£ Total**
Original application values	12,614.40	40,725.00	6,536.42	59,875.82
Total planned spend to date	12,614.40	40,725.00	6,536.42	59, 875.82
Total actuals spend to date	0	44,222.00	JM @50hr =2247 BFJ @160hr = 2280 DN @20hr=600 Total=£5127	47,544
Predicted total project cost at project completion	12,614.40	44,222.00	6,536.42	63,372.82
Predicted over/ underspend at project completion	0	2,497	0	3,497

Project status	
Project Start date	17/5/22.
Project end date	June 2024 – Final report to Defra by August 2024
Is the project complete	No
If not complete, what is the current RAG rating?	Amber (Enter as appropriate)

Please record RAG status history below

RAG	Criteria Description	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8
Green	Successful delivery of the project/programme to time, cost and quality appears highly likely and there are no major outstanding issues that at this stage appear to threaten delivery significantly.	☐	☐	☐	☐	☐	☐	☐	☐
Amber / Green	Successful delivery appears probable however constant attention will be needed to ensure risks do not materialise into major issues threatening delivery.	☐	☐	☐	☐	☐	☐	☐	☐
Amber	Successful delivery appears feasible but significant issues already exist, requiring management attention. These appear resolvable at this stage and if addressed promptly, should not present a cost/schedule overrun.	☒	☒	☒	☒	☒	☒	☒	☐
Amber / Red	Successful delivery of the project is in doubt with major risks or issues apparent in several key areas. Urgent action is needed to ensure these are addressed, and to establish whether resolution is feasible.	☐	☐	☐	☐	☐	☐	☐	☐
Red	Successful delivery of the project appears to be unachievable. There are major issues on project definition, schedule, budget required, quality or benefits delivery, which at this stage do not appear to be manageable or resolvable. The project may need re-baselining and/or overall viability re-assessed.	☐	☐	☐	☐	☐	☐	☐	☐

2. Provide a brief description of the project

Guidance: *Please provide a brief description of the project and its aims including planned activities, outputs, and anticipated benefits. Please include details of project partners and division of work. This section should be completed once and reflect the initial goals set out in your application*.

Please write your answer here.

There is increasing local public concern around $PM_{2.5}$ in Dorset, and it is recognised that currently there is little information in relation to current concentrations, how concentrations vary across the County and the magnitude of contributions from different sources relate to the overall emissions.

The project will use a combination of additional monitoring, and a public awareness campaign to increase knowledge and information about $PM_{2.5}$; provoke behaviour change and ultimately reduce $PM_{2.5}$ emissions within solid fuel burning areas by outlining steps that can be taken by individuals to reduce their impact on $PM_{2.5}$ from solid fuel burning. The project will also respond, to some extent, to increasing local concern around $PM_{2.5}$.

Although the project will be implemented solely by Dorset Council, it will build on monitoring already underway by Public Health, thus furthering collaborative working across disciplines.

It is also anticipated that the public awareness work will be built on in the future (if funding allows) and expanded to a more ambitious, and potentially regional awareness campaign in line with public health priorities. This project will test out messaging, and methods of awareness raising in a cost-effective way.

Work package 1: Monitoring

The monitoring strategy has the following broad aims:

• To provide an understanding of key emission sources of $PM_{2.5}$ in Dorset; and
• to provide an indication of how concentrations across Dorset compare against relevant air quality standards

Procurement period, identifying locations of monitoring and gaining permissions- May 2022- June 2022

Commencement of the procurement programme to purchase 6 new AQmesh small sensor systems and arrange the recalibration of 4 existing pods.

The 4 pods are currently located at schools across Dorset and provide regional background concentrations.

Three further locations have been identified where it is thought high solid fuel burning occurs and two pods will be installed at each location in order to measure both roadside and

background levels. Permissions have been sought by the relevant agency to install and run the pods.

In addition to $PM_{2.5}$, the sensors will also measure PM_{10} and $PM_{1,}$
alongside appropriate meteorological measurements, which can identify individual sources or source-groups.

Monitoring Period June 2022 – May 2023

The monitoring period is over 12 months to ensure all seasonal variations are accounted for. Any issues with data loss or drift are flagged up automatically by the supplier but Dorset Council will review the monitoring data on a monthly basis

.

Analysis of Data July & August 2023

At the end of the 12 month monitoring period the analysis of the monitoring data will be contracted out. The analysis will look for correlations of the sites against available meteorological data to show concentrations in different wind directions, differences between the site types and therefore likely contributions from specific sources such as traffic (i.e., if the concentrations are highest when the wind is in the direction of the road, this infers the additional contribution of the road). Analysis of temporal variation will also be undertaken, for example whether there are times of the day or week where concentrations are highest (at solid fuel burning sites, this may equate to particularly cold periods, or weekend evenings during the winter, roadside sites may see an increase at peak hours or during school holidays). The report will be written up as public friendly and be used for knowledge transfer

Work package 2: Public Awareness Raising in Relation to Solid Fuel Burning – Autumn/ Winter 2022

This work package will be implemented alongside monitoring. It will complement work being undertaken at a national level. The campaign will encourage solid fuel users to make positive changes to their burning habits by including information on better quality fuels, upgrade, servicing and maintenance of appliances, chimney housekeeping, energy efficiency and public health.

These messages will be localised, and disseminated using a number of methods including:

- The local media, in particular the Dorset Echo;
- Engagement directly with local resident's groups;
- Leaflets at relevant Council offices; and
- Social media campaigns.

Work Package 3: Survey of Behaviour – Autumn 2022 & Autumn 2023

Existing structures will be used to undertake a short online survey of solid fuel use at the start and end of the project. For example, Questions to be asked will include whether the respondent undertakes any solid fuel burning, and if so, what appliance they use, what fuel they use, and

how often they use it. Questions about the awareness of the impact of solid fuel burning will also be included.

Work Package 4: Evaluation and Knowledge Transfer - August & September 2023

A final report will be provided which will draw together findings from pollution data, the analysis, the public awareness raising work and where relevant, provide recommendations for future work and resources required. This report will provide the basis of the evaluation, and will provide the evidence on which knowledge transfer, particularly to other local authorities, will happen.

Outcomes

It is difficult to quantify the outcomes of projects aimed at behavioural change. There are few studies examining the association between interventions to reduce solid fuel burning. At this stage, there is no data on the current use of solid fuel burning in Dorset. It is therefore impossible to provide any quantifiable figures on either current levels of emissions/ concentrations of $PM_{2.5}$ or the impacts of a public awareness campaign. It is, however, hoped that by undertaking this project, this lack of data will improve in the future.

Expected secondary effects

There will be a number of wider positive benefits of measures to be implemented on solid fuel burning in Dorset. Encouraging correct stove and fireplace use will also have health and safety benefits (lower fire and carbon monoxide poisoning risks). Lower wood fuel use could result in increased gas use which may result in an increase in greenhouse gas emissions. However, for "casual" wood users this impact is likely to be minimal. Where wood is used as a primary heat source, users could switch to gas heating (higher GHG emissions) or to electrical heating (including solar and Air Source Heat Pumps) which has the potential to be zero carbon, although there may be issues around fuel poverty.

Work being undertaken through the Dorset Action Plan on Renewable Energy, and that for Buildings (both being undertaken in response to the Climate Emergency) will be supported, to reduce emissions of $PM_{2.5}$ from the domestic, and commercial, sector across the Dorset area. These include projects to both maximise energy efficiency and increase renewable energy in these sectors. Projects being undertaken by Low Carbon Dorset are assisting in delivery of these aims.

3. Project air quality objectives

Guidance: *Please indicate which study area(s), emissions source(s) and pollutants are relevant to this project. Please enter any comments as needed.*

Study Area(s)	Y/N?	Comments (please include details of data collection in relation to study area)
Clean Air Zones/ Low Emission Zones		
Emissions Abatement Technology		
Remote Sensing		
Smoke Control Areas		
Communication	Y	
Monitoring	Y	
Modelling	Y	
Behavioural Change	Y	
Fleet Improvement		
Traffic Management		
Vulnerable groups (schools, hospitals etc)		
Other (Please confirm)		
Emission Source	Y/N?	Comments
Cars		
HGVs		
Buses		
Boats and waterways		
Trains		
Biomass		
Domestic burning	Y	
Industry		
Other		
Pollutant	Y/N?	Comments
NO2		
PM10	Y	
PM2.5	Y	
Other		

4. Changes to project

Guidance: *If the project has changed from what was set out in your application (i.e. outputs have changed, delivery methods have changed, delays etc.) please set out what changes have been made, why they were necessary and what impact they have on the overall project plan (i.e. new or moved milestones, new outputs/benefits). If the changes have altered the original project plan, please include a revised project timeline clearly marking where changes to timing have been made.*

Quarter 1 – end of June 2022

The procurement of the new monitoring pods and recalibration of the existing pods has been subject to a delay, chiefly because of the loss of the project leader, Coralie McGown and associated expertise. A replacement lead is now in place, Ben Jones.

The timeline set out in the application for Work package 1 – Procurement period, identifying locations of monitoring and gaining permissions; monitoring and analysis has therefore changed as follows

Procurement and installation: May – July 2022.

Monitoring period: August 2022-July 2023

Monitoring Analysis: August & September 2023

This will also have a knock-on effect on **Work Page 4, Evaluation and Knowledge Transfer, Monitoring which will occur in September, October and November 2023.**

Quarter 2 – end of September 2022

There has been a delay in obtaining agreement from various stakeholders (town and parish councils) to install the pods. This has now been resolved. This has again pushed back the timeline for monitoring.

Quarter 3 – end of December 2022

The installation of the air quality monitoring pods has been successful, and all pods are now installed and monitoring air quality in locations, despite significant delays and difficulties in their obtaining and installation.

Quarter 4 – end of March 2023

Monitoring Jan 2023 – Dec 23 – final survey Jan/ Feb 2024. Analysis Jan/ march 2024. Final Report June 2024.

Quarter 5 – end of June 2023

No changes.

Quarter 6 – end of September 2023

No changes.

Quarter 7 – end of December 2023

Decision was taken to extend the monitoring to end of March 2024 for both comparison purposes (Jan-Mar 2023/2024) and due to elections resulting in inability to effectively consult given timeframes required for further publicity around burn better.

Quarter 8 – end of March 2024

Please write your update here.

(Please add/amend delete quarters as necessary until the project is complete)

5. Progress to date

Guidance: *Please provide a brief description of the work carried out to date (500 words or less), with reference to key milestones. This should include whether the project is proceeding in accordance with the estimated timescales of the most up to date project plan*.

Quarter 1 – end of June 2022

Equipment and materials have been sourced and placed on order from ACEOM, with a lead time of three to four weeks. The locations of the new AQMesh Pods have been determined by analysing HETAS registrations (limitations in that they won't include all new sites, or existing locations, but useful to narrow down areas), off gas network areas (https://www.nongasmap.org.uk/); complaints; traffic data and local knowledge.

Specific lamppost information and installation specifications are close to being finalised and final quote being sourced ready for installation in July and commencement of monitoring in August.

Quarter 2 – end of September 2022

Equipment and materials have been sourced, ordered and received from ACEOM with six new pods ready to be installed at the end of October. Existing pods have been collected and returned to the manufacturer for service, repair and recalibration. Exact pod sites have been determined, and five of six of the site owners have confirmed and are ready for installation.

There were many meetings with our communication and consultation colleagues over the summer period to discuss the drafting and rollout of the resident's survey on solid fuel use. The starting survey (there will be another one at the end of the monitoring period to analyse and behaviour change) has been designed and is ready for publication. The scope for and number of homes to receive the survey marketing material has been identified. and the letter informing them of the study has been drafted. This is ready for roll-out at the beginning of November.

Quarter 3 – end of December 2022

Air quality monitoring pods have now been installed and are collecting data at the proposed sites. Agreements have been established with sites to allow for one year's data collection, meaning collection will continue until December 2023.

The survey to analyse behaviour has been completed by a significant number of respondents with a range of burning behaviours, and the response are due to be analysed shortly. It would

appear that the survey marketing strategy was successful given the short timeframe the survey was live for.

Quarter 4 – end of March 2023

Air quality monitoring pods have been successfully activated and are collecting monitoring data. Minor teething issues were identified with one of the monitoring pods, however this was resolved without the loss of data.

Early conversations around the marketing campaign for behaviour change have been held with our communications team, and generally revolve around the promotion of existing literature from partner agencies.

Quarter 5 – end of June 2023

Behaviour change campaign preparation has begun and community information evenings in collaboration with Transport, Climate and Ecology, Housing and HETAS are being arranged. Venues and dates have been secured in each locality utilising town and parish council venues. Monitoring continues.

Quarter 6 – end of September 2023

3 community information evenings have been held (with the final evening in Swanage in early October) and, despite some intrusion from organised conspiracy theorists many have left with positive action to take to improve burning practices. Questions exist around action others can take depending on their circumstances.

Quarter 7 – end of December 2023

Community events concluded with mostly positive outcomes in October. Further promotion and publicity carried out to December for burn better programme via social media and website, as well as targeted publicity to surveyed areas directing residents towards website.

Quarter 8 – end of March 2024

Please write your update here.

(Please add/amend delete quarters as necessary until the project is complete)

6. Issues and risks faced

Guidance: *Please provide a brief description of any issues and risks faced or anticipated that may affect or have affected project outcomes or the timescales for delivery. Please also provide details of how you have addressed or intend to address these issues/risks. If you report amber, amber/red, or red in your RAG status for section 5, please indicate what action will be taken to return the status to green. (500 words or less).*

Quarter 1 – end of June 2022

In the period between submitting the proposal application and receiving confirmation of the successful bid, Dorset Council's Air Quality, Coralie McGown left our employment. She had been tasked with both operational and monitoring responsibilities in the various work packages. In finding a suitable replacement to take on these works with have incurred a delay to work package 1 which consequently means work page 4 will also be delayed.

Since April we have appointed a new Team Leader to replace Coralie McGown who will oversee the lead officer, Ben Jones who sits within their team. Janet Moore will retain overall responsibility for the project.

Quarter 2 – end of September 2022

Principal issue has been surrounding communication and community buy-in when determining appropriate locations to site pods. Multiple attempts at communication have been made, and often replies are not received without prompting. The turn- around for the servicing and repair of existing pods has been longer than expected, as was the budgetary requirement for buying new pods and calibration of old pods.

Quarter 3 – end of December 2022

Principal issue during Q3 was the implementation of the siting of pods which included run-over from issues experienced in Q2. Some locations did not confirm consent to install until December 2022, and some siting issues were discovered only when installation teams arrived on site. These were quickly resolved however due to staff ingenuity and professionalism. Once installed, all pods were instantly operational.

Quarter 4 – end of March 2023

No issues or risks.

Quarter 5 – end of June 2023

Issues faced largely were around scale and scope of information evenings, and the willingness of other council teams and external agencies to participate. Five participants were secured providing sufficient content to run the evenings.

Further challenge came from ensuring our message to be advertised was widely and deeply felt, but expert advice from our comms team proved very helpful.

Quarter 6 – end of September 2023

Principal challenge existed in the number of attendees to the events that wished to express their own (incorrect and/or conspiratorial) beliefs on the council's platform, and did so disrespectfully and rudely making presenters uncomfortable. This required a re-format of the evening for the second event, which proved more successful but still attracted some whom were not present for the purpose of the meeting. Further challenge arose by the absence of certain teams who would be better placed to answer questions resulting in further research being required to answer queries from event attendees.

Quarter 7 – end of December 2023

Minor challenges existed in cost-effectiveness of certain methods of publicity and promotion of materials for burn better – mailing of leaflets proved too expensive therefore alternative found in form of letter directing residents to website and use of digital resources.

Quarter 8 – end of March 2024

Please write your update here.

(Please add/amend delete quarters as necessary until the project is complete)

7. Project outputs and benefits

Guidance: *Please outline what data and evidence you have collected in relation to activities undertaken. Please provide a summary of any observations/conclusions that can be drawn from these activities, and in particular, details of any observed or estimated benefits such as reductions in emissions and/or pollutant concentrations. Please set out how actual outputs and benefits compare to anticipated outputs and benefits, as detailed in the project application, explaining any differences.*

(Electronic copies of any completed outputs should be submitted alongside this form.)

Quarter 1 – end of June 2022

None at present.

Quarter 2 – end of September 2022

None at present

Quarter 3 – end of December 2022

Early data output is too narrow to be of use at this stage, however does confirm pods are in good working order and target pollutants are present at monitoring sites.

Quarter 4 – end of March 2023

Pods continue to collect data effectively with target pollutants in sufficient quantities.

Quarter 5 – end of June 2023

No outputs measured

Quarter 6 – end of September 2023

Engagement from community events circa 100 people (excluding those deliberately attending to disrupt). Survey data analysis with 6month air quality data analysis showing correlations between burning behaviours reported and $PM_{2.5}$ concentrations - I.e. changing concentrations match time-of-year data and time-of-day data.

Quarter 7 – end of December 2023

No outputs measured.

Quarter 8 – end of March 2024

Please write your update here.

(Please add/amend delete quarters as necessary until the project is complete)

8. Financial Performance

Guidance: *Please provide details of the anticipated project spend at this stage of the project as well as the actual project expenditure. Please explain the reasons for any difference between these figures and provide an overview of how any overspend/underspend will be dealt with.*

Quarter 1 – end of June 2022

The initial cost of new monitoring equipment and updating of existing equipment is estimated to be broadly in line with the provided budget, and if overspend is to occur this is likely to be well within 10% of the total expenditure budget. Final quote to be confirmed prior to installation.

Total spending so far has been on preparatory work for work package one including meetings between officers, collecting data, sourcing quotes and dealing with anomalies. Spend is detailed under the match funding element at £700 to date.

Quarter 2 – end of September 2022

The 6 new pods have been purchased. Infrastructure costs were more expensive than initially anticipated for several reasons: supplier costs had increased since previous purchase of pods; significant maintenance was required to the four existing pods; and additional specifications were required. This chiefly required the ordering of solar panels for powering the pods as mains connection in the lampposts would have required significant administration and posed safety and feasibility issues.

Quarter 3 – end of December 2022

Officer revenue costs relating to future planning.

Quarter 4 – end of March 2023

Installation costs, not accounted for in bid have now been paid. Officer revenue costs for the planning of the awareness raising campaign and community events.

Officer time on monitoring working order of pods.

Quarter 5 – end of June 2023

Officer revenue cost in setting up the behaviour change campaign.

Quarter 6 – end of September 2023

3 Community events – venue costs, material costs and officer time and on costs.

Quarter 7 – end of December 2023

Officer revenue costs on community event feedback and analysis.

Quarter 8 – end of March 2024

Please write your update here.

(Please add/amend delete quarters as necessary until the project is complete)

9. Knowledge transfer

Guidance: *Please provide an evaluation of the project against the plans for knowledge transfer detailed in your application (500 words or less). This should include an overview of which stakeholders will be involved and the mechanisms for engagement (e.g. reports, meetings, presentations, etc.). If knowledge transfer activities have not yet been completed, please provide an overview of the preparatory work undertaken and any lessons learnt to date which will form part of the knowledge transfer.*

Quarter 1 – end of June 2022

In terms of providing suitable monitoring sites, and areas at which to focus our behaviour change interventions, we have identified the 3 locations in Dorset that are likely to have relatively high incidences of solid fuel burning sites. These are Swanage, Maiden Newton and Bridport. Assessments have been made as detailed in section 5

Quarter 2 – end of September 2022

There have been a number of email exchanges with various stakeholders either informing them of the project, its aims and expected outcomes or requesting permission to house the monitoring units. These include the relevant town and parish councils, ward councillors and the Dorset Council Portfolio Holder for Community and Public Protection Service

In terms of preparation for the survey, colleagues in our communication and consultation service have been working closely with us through written exchanges and online meetings, in developing the materials required so that the resident's information is targeted, informative and will provide an optimum response rate.

Quarter 3 – end of December 2022

There has been further communication with stakeholders about the project, including specific technical reasoning for the siting of monitoring units. These include the relevant town and parish councils, ward councillors, private bodies, and the Dorset Council Portfolio Holder for Community and Public Protection Service

Colleagues in our communication and consultation service have continued to work closely with us through the survey period. We continue to collaborate as we move into data analysis.

Quarter 4 – end of March 2023

Colleagues in our communication and consultation service have continued to feed into the process and consult on best practice moving forwards.

Quarter 5 – end of June 2023

Colleagues in our communication and consultation service have continued to feed into the process and consult on best practice moving forwards.

Quarter 6 – end of September 2023

Communication with public during events has been mixed in terms of success (from initial anecdotal evidence), however further analysis to be carried out on feedback survey data. Further behaviour change and public advice to be provided as part of campaign.

Quarter 7 – end of December 2023

Please write your update here.

Quarter 8 – end of March 2024

Please write your update here.

(Please add/amend delete quarters as necessary until the project is complete)

10. Signatory

Name of Officer at the local authority:

Janet Moore

Name of Local Authority:

Dorset Council

Date:

25/04/2024

Appendix 3: Air Quality Monitoring Data

Monthly summaries of data are shown here for simplicity due to significant quantities of data. Specific data can be obtained from the author upon reasonable request.

						2022						
PM10	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
943												
944												
945												
946												
947												
948												
STUDY												
1766	10.34	9.31	17.22	8.22	7.37	5.86	4.15	6.74	6.63	2.04	11.94	23.68
1767	49.91	14.37	40.49	28.93	18.62	11.11	6.93	10.14	25.79	10.46	7.00	26.16
BACK			28.85	18.58	12.99	8.48	5.54	8.44	16.21	6.25	9.47	24.92
BORN												
MACK						10.00	8.84	12.27	9.05	9.82	10.05	12.24
HONI			25.34	12.21	8.98	9.82	8.36	10.25	9.35	10.43	10.59	11.70
AURN			25.34	12.21	8.98	9.91	8.60	11.26	9.20	10.13	10.32	11.97

						2023						
PM10	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
943	39.04	26.11	28.08	10.48	7.91	4.76	4.17	3.96	5.08	3.31	3.55	4.01
944	24.48	21.28	19.71	13.81	12.07	12.06	10.62	9.51	13.79	10.39	10.37	13.45
945	44.87	40.88	30.80	23.07	21.03	10.97	14.68	15.86	20.35	26.27	18.74	32.45
946	24.56	31.65	28.20	14.23	14.39	12.94	15.27	27.88	19.03	18.42	18.98	27.79
947	52.58	59.58	41.77	20.25	16.65	14.50	14.87	14.33	14.62	8.54	11.77	13.01
948	31.51	19.26	33.88	16.06	23.87	10.05	13.26	13.19	18.53	20.43	18.26	21.32
STUDY	36.17	33.13	30.41	16.32	15.99	10.88	12.14	14.12	15.23	14.56	13.61	18.67
1766	26.92	19.00	20.79	13.80	17.18	10.06	8.59	5.82	8.36	8.87	8.74	15.22
1767	18.73	13.58	16.49	12.23	11.15	8.36	6.48	6.11	8.19	6.89	7.92	8.99
BACK	22.83	16.29	18.64	13.01	14.17	9.21	7.53	5.97	8.27	7.88	8.33	12.10
BORN												
MACK	12.23	11.73	9.01	10.92	10.08	12.88	7.57	7.10	13.50	9.26	8.43	8.81
HONI	11.39	10.53	10.04	11.18	11.04	13.53	7.83	6.93	13.42	8.92	8.98	9.43
AURN	11.81	11.13	9.53	11.05	10.56	13.20	7.70	7.01	13.46	9.09	8.71	9.12

			2024			
PM10	Jan	Feb	Mar	Apr	May	Jun
943	4.27	3.62	3.48	2.94	3.76	3.33
944	13.82	16.21	15.22	11.91	12.14	8.06
945	20.01	23.80				
946	24.75	30.66	20.77	17.39	13.64	10.60
947	15.15	15.64	14.78	12.44	9.00	6.00
948	21.19	22.40	18.85	16.86	11.71	8.96
STUDY	16.53	18.72	14.62	12.31	10.05	7.39
1766	15.02	15.66	14.73	11.64	11.71	8.42
1767	10.23	9.43	10.32	8.12	8.10	6.53
BACK	12.62	12.55	12.53	9.88	9.91	7.47
BORN						
MACK	11.03	8.30	9.91	8.99	10.38	9.27
HONI	11.08	8.49	9.25	9.42	10.98	9.05
AURN	11.06	8.39	9.58	9.20	10.68	9.16

	2022											
PM2.5	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
943												
944												
945												
946												
947												
948												
STUDY												
1766	5.11	2.61	9.31	4.14	3.22	2.19	1.70	3.16	2.54	0.75	3.78	12.68
1767	16.20	4.18	17.43	8.83	5.96	3.55	2.43	4.10	5.82	3.84	2.17	8.70
BACK	10.65	3.40	13.37	6.48	4.59	2.87	2.06	3.63	4.18	2.29	2.97	10.69
BORN	14.28	8.67	17.88	11.27	9.31	8.67	6.96	7.81	6.54	7.70	8.84	13.78
MACK						5.06	4.30	5.47	4.95	5.14	5.91	9.16
HONI			18.78	8.32	5.57	5.47	4.50	5.26	5.11	5.35	6.00	8.53
AURN	14.28	8.67	18.33	9.79	7.44	6.40	5.25	6.18	5.53	6.06	6.92	10.49

						2023						
PM2.5	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
943	22.31	15.34	13.09	8.35	6.50	4.95	4.07	3.91	4.98	3.08	3.25	3.55
944	12.15	13.03	9.18	9.66	7.88	9.16	5.53	5.46	8.54	5.67	5.56	6.79
945	21.98	19.04	13.30	13.58	9.84	8.30	7.64	7.74	8.99	8.31	8.04	9.58
946	13.89	15.25	13.37	9.94	8.44	8.97	7.92	12.38	11.00	9.09	9.16	11.45
947	26.61	26.40	17.24	12.47	9.86	10.43	9.48	10.87	10.64	5.70	8.37	8.03
948	17.44	12.84	13.61	9.77	8.05	7.87	6.55	5.99	9.94	7.79	8.18	8.77
STUDY	19.06	16.98	13.30	10.63	8.43	8.28	6.87	7.72	9.02	6.61	7.09	8.03
1766	16.70	13.31	10.82	10.85	9.01	8.23	5.18	4.37	6.69	5.74	6.00	8.16
1767	10.84	9.52	8.19	7.71	6.53	6.58	4.39	4.26	5.96	4.67	5.15	5.39
BACK	13.77	11.42	9.50	9.28	7.77	7.40	4.79	4.32	6.32	5.20	5.58	6.78
BORN	12.37	10.85	9.89	10.99	9.40	10.01	5.92	5.69	9.32	6.78	7.47	5.84
MACK	8.52	8.47	5.95	7.65	6.21	7.52	3.90	3.75	7.36	5.31	5.05	5.58
HONI	7.55	7.34	6.33	7.67	6.72	8.39	4.20	3.90	7.20	4.93	5.24	5.69
AURN	9.48	8.89	7.39	8.77	7.44	8.64	4.67	4.45	7.96	5.67	5.92	5.71

			2024			
PM2.5	Jan	Feb	Mar	Apr	May	Jun
943	3.90	2.98	3.24	2.56	3.86	3.30
944	7.82	6.43	8.22	5.59	9.10	5.57
945	8.27	8.00				
946	11.34	11.89	10.87	8.50	9.00	6.33
947	10.94	7.84	8.52	5.81	5.45	3.25
948	8.88	6.44	7.77	5.77	6.96	5.30
STUDY	8.52	7.27	7.73	5.65	6.87	4.75
1766	9.61	8.32	9.59	6.57	8.48	5.58
1767	6.78	5.08	6.61	4.74	6.07	4.83
BACK	8.20	6.70	8.10	5.65	7.27	5.21
BORN	8.43	7.22	8.72	7.29	8.59	6.34
MACK	7.04	4.74	6.73	5.40	6.53	5.13
HONI	7.13	4.63	5.99	5.59	7.29	5.53
AURN	7.53	5.53	7.15	6.09	7.47	5.67

Temperature Monitoring Data

		Chivenor			Hurn			Yeovilton			Average				
	Month	Max	Min	Av	Max	Min	Av	Max	Min	Av	Max	Min	Av	30y Clim	Diff
2022	Jan	9.8	3.3	6.6	9.5	0.2	4.9	9.0	0.5	4.8	9.4	1.3	5.4	5.5	-0.1
2022	Feb	11.1	5.5	8.3	11.2	3.3	7.3	11.2	3.8	7.5	11.2	4.2	7.7	5.7	2.0
2022	Mar	13.2	4.5	8.9	12.6	3.6	8.1	13.1	3.5	8.3	13.0	3.9	8.4	7.3	1.1
2022	Apr	14.8	5.7	10.3	15.2	3.8	9.5	14.9	3.8	9.4	15.0	4.4	9.7	9.3	0.4
2022	May	17.2	9.8	13.5	18.4	8.3	13.4	18.1	8.4	13.3	17.9	8.8	13.4	12.2	1.2
2022	Jun	19.9	10.9	15.4	21.0	10.0	15.5	20.6	9.5	15.1	20.5	10.1	15.3	14.9	0.4
2022	Jul	22.8	13.6	18.2	24.7	12.3	18.5	24.3	11.8	18.1	23.9	12.6	18.3	16.9	1.4
2022	Aug	24.2	13.9	19.1	25.5	12.9	19.2	25.7	12.8	19.3	25.1	13.2	19.2	16.8	2.4
2022	Sep	19.1	11.6	15.4	19.9	9.8	14.9	19.8	9.9	14.9	19.6	10.4	15.0	14.6	0.4
2022	Oct	17.5	11.0	14.3	18.0	9.6	13.8	17.9	9.8	13.9	17.8	10.1	14.0	11.6	2.4
2022	Nov	13.2	8.2	10.7	13.7	6.4	10.1	13.2	6.9	10.1	13.4	7.2	10.3	8.3	2.0
2022	Dec	8.5	2.3	5.4	8.0	0.4	4.2	7.8	0.4	4.1	8.1	1.0	4.6	6	-1.4
2023	Jan	9.8	3.8	6.8	9.1	1.2	5.2	9.0	1.4	5.2	9.3	2.1	5.7	5.5	0.2
2023	Feb	10.4	3.7	7.1	10.4	1.5	6.0	10.6	2.0	6.3	10.5	2.4	6.4	5.7	0.7
2023	Mar	11.3	5.6	8.5	10.9	4.9	7.9	11.0	4.8	7.9	11.1	5.1	8.1	7.3	0.8
2023	Apr	13.6	6.2	9.9	13.7	4.0	8.9	13.7	4.6	9.2	13.7	4.9	9.3	9.3	0.0
2023	May	18.1	8.9	13.5	19.0	7.5	13.3	18.5	7.5	13.0	18.5	8.0	13.3	12.2	1.1
2023	Jun	22.4	12.9	17.7	23.9	11.9	17.9	23.4	12.0	17.7	23.2	12.3	17.8	14.9	2.9
2023	Jul	19.8	13.7	16.8	21.1	12.8	17.0	20.7	12.9	16.8	20.5	13.1	16.8	16.9	-0.1
2023	Aug	20.1	13.9	17.0	21.3	12.2	16.8	21.4	12.4	16.9	20.9	12.8	16.9	16.8	0.1
2023	Sep	21.5	13.6	17.6	2.5	12.0	7.3	22.3	12.5	17.4	15.4	12.7	14.1	14.6	-0.5
2023	Oct	17.1	10.6	13.9	17.4	9.0	13.2	17.2	9.2	13.2	17.2	9.6	13.4	11.6	1.8
2023	Nov	12.3	7.4	9.9	12.2	4.6	8.4	11.9	5.2	8.6	12.1	5.7	8.9	8.3	0.6
2023	Dec	11.5	7.1	9.3	11.4	5.3	8.4	11.3	5.7	8.5	11.4	6.0	8.7	6	2.7
2024	Jan	9.1	3.2	6.2	8.6	1.4	5.0	8.5	1.4	5.0	8.7	2.0	5.4	5.5	-0.1
2024	Feb	11.5	6.6	9.1	11.7	5.3	8.5	11.8	5.6	8.7	11.7	5.8	8.8	5.7	3.1
2024	Mar	12.0	5.9	9.0	12.2	4.6	8.4	12.3	5.0	8.7	12.2	5.2	8.7	7.3	1.4
2024	Apr	13.6	7.6	10.6	14.1	6.4	10.3	14.0	6.5	10.3	13.9	6.8	10.4	9.3	1.1
2024	May	18.0	9.8	13.9	18.1	8.8	13.5	18.4	8.9	13.7	18.2	9.2	13.7	12.2	1.5
2024	Jun	18.2	11.1	14.7	20.5	8.8	14.7	19.7	8.9	14.3	19.5	9.6	14.5	14.9	-0.4
2024	Jul	20.1	12.8	16.5	21.7	12.1	16.9	21.4	11.9	16.7	21.1	12.3	16.7	16.9	-0.2
2024	Aug	20.9	14.2	17.6	22.3	13.2	17.8	22.2	12.8	17.5	21.8	13.4	17.6	16.8	0.8
2024	Sep	18.2	11.9	15.1	19.0	10.3	14.7	18.3	10.7	14.5	18.5	11.0	14.7	14.6	0.1

Appendix 4: Survey Invitations, Questions and Responses

An overall summary of data are shown here for simplicity due to significant quantities of data. Specific data can be obtained from the author upon reasonable request.

Prior Knowledge Questions (beginning survey only)

	Beginning	
Are you aware of the Government's Clean Air Strategy?	n	%
No, I have never heard of it	18	10.5
Yes, I have heard of it and have some idea of what it covers	65	37.8
Yes, I am fully aware of the strategy and what it covers	34	19.8
(Blank)	55	32.0
Have you ever heard of fine Particulate Emissions?		
No, I do not know what they are	24	14.0
Yes, I have some idea of what they are	89	51.7
Yes, I am fully aware of fine particulate emissions and their health impacts	58	33.7
(Blank)	1	0.6

Comparable Behaviour Questions (beginning and end surveys)

	Beginning		End		
What appliance do you have?	n	%	n	%	Change %
Woodburning or multi-fuel stove	121	70.3	46	68.7	-1.7
Open fireplace	40	23.3	18	26.9	3.6
Multiple appliances	10	5.8	3	4.5	-1.3
Not answered	1	0.6	0	0.0	
Is your appliance HETAS registered?					
Yes	74	43.0	33	49.3	6.2
No	9	5.2	9	13.4	8.2
Don't know	89	51.7	25	37.3	-14.4
Not answered	0	0.0	0	0.0	
What is the function of your appliance(s)?					
It provides extra warmth in addition to the main source of heating	129	75.0	59	88.1	13.1
It is the main source of heating	29	16.9	5	7.5	-9.4
It is for aesthetic purposes only	12	7.0	3	4.5	-2.5
Not answered	2	1.2	0	0.0	
How often do you sweep your chimney?					
0-6 months	12	7.0	0	0.0	-7.0
6-12 months	94	54.7	35	52.2	-2.4
1-2 years	50	29.1	26	38.8	9.7
More than 2 years	10	5.8	3	4.5	-1.3

The chimney isn't swept		5	2.9	2	3.0	0.1
Not Answered		1	0.6	1	1.5	
How often do you service your appliance?						
Every 0-6 months		6	3.5	0	0.0	-3.5
Every 6-12 months		36	20.9	24	35.8	14.9
Every 1-2 years		34	19.8	8	11.9	-7.8
More than 2 years*4	**			0	0.0	
I do not have my stove serviced		49	28.5	19	28.4	-0.1
N/A (Open Fireplace)		47	27.3	16	23.9	
What fuel do you burn?						
Firewood (i.e. logs)		147	85.5	56	83.6	-1.9
Coal		9	5.2	7	10.4	5.2
Briquettes*1		11	6.4	4	6.0	-0.4
Not Answered		5	2.9	0	0.0	
Are your logs seasoned?						
Seasoned logs		137	79.7	52	77.6	-2.0
Unseasoned logs		5	2.9	3	4.5	1.6
Not Answered		30	17.4	12	17.9	
Where do you source your firewood?						
National supplier		2	1.2	2	3.0	1.8
Local supplier		98	57.0	35	52.2	-4.7
Wood you find/collect (ie/ fallen branches, locally felled trees)		36	20.9	16	23.9	3.0
Waste wood (ie off cuts, pallets)		9	5.2	2	3.0	-2.2
Not Answered		27	15.7	12	17.9	
How long do you season for?						
0-6 months		5	2.9	2	3.0	0.1
6-12 months		25	14.5	7	10.4	-4.1
1-2 years		63	36.6	11	16.4	-20.2
2-4 years*2		17	9.9	8	11.9	2.1
Not Answered/I don't season*3		39	22.7	26	38.8	16.1
I don't use wood I find or collect myself/Not Answered		23	13.4	13	19.4	6.0
Which of the following do you believe to be true?						
Burning the wrong fuels in stoves and fireplaces can significantly affect air quality and health		17	9.9	7	10.4	0.6
Regularly maintaining your stove / fireplace can increase its efficiency and reduce the risk of chimney fires		20	11.6	5	7.5	-4.2
All of the above		127	73.8	54	80.6	6.8
None of the above*5		8	4.7	1	1.5	-3.2

**1 – Assumed to be any form of briquette*

**2 – Error caused "2 years" to be answerable with both "1-2 years" and "2-4 years"*

**3 – Change in question between beginning and end surveys meant this was closes comparison available*

**4 – Option not available for beginning survey*

**5 – Option not available for beginning survey, but answer not compulsory so includes those not answering*

Campaign Influence Questions (end survey only)

	End	
Which, if any, of the following Dorset Council communications have you seen in the last 12 months related to solid fuel burning?	n	%
None of the above	40	59.7
Social media posts	1	1.5
Letter to your household	11	16.4
Burning habits survey	6	9.0
Printed flyers or posters	1	1.5
Email	1	1.5
Total 1 method	20	29.9
Social media posts, Letter to your household	1	1.5
Printed flyers or posters, Letter to your household, Burning habits survey	1	1.5
Letter to your household, Burning habits survey	2	3.0
Social media posts, Printed flyers or posters	1	1.5
Social media posts, Printed flyers or posters, Letter to your household	1	1.5
Letter to your household, This Survey, Household Fuel Survey	1	1.5
Total 1 or more method	27	40.3
Have you attended any of Dorset Council's Creating Cleaner Air Communities information events in the last 12 months?		
Yes	1	1.5
No	65	97.0
Don't know	1	1.5
Which of the following statements are true for you in the last 12 months?		
None of the above	10	14.9
I have had my chimney swept	13	19.4
I use my appliance less regularly	4	6.0
I have had my appliance serviced	1	1.5
I have seasoned my wood for longer than I have previously	1	1.5
I have stopped using an unsuitable fuel in my appliance (e.g. treated wood, wet wood, household waste)	2	3.0
Total 1 method	21	31.3
I have had my chimney swept, I have had my appliance serviced	15	22.4
I have had my chimney swept, I use my appliance less regularly	3	4.5
I have had my chimney swept, I have seasoned my wood for longer than I have previously	3	4.5
I have had my chimney swept, I have changed my fuel to Woodsure "Ready to Burn" approved suppliers	1	1.5
I have had my chimney swept, I have stopped using an unsuitable fuel in my appliance (e.g. treated wood, wet wood, household waste), I have changed my fuel to Woodsure "Ready to Burn" approved suppliers	1	1.5

Total 2 method	23	34.3
I have had my chimney swept, I have had my appliance serviced, I have stopped using an unsuitable fuel in my appliance (e.g. treated wood, wet wood, household waste)	1	1.5
I have had my chimney swept, I have had my appliance serviced, I have seasoned my wood for longer than I have previously	5	7.5
I have had my chimney swept, I have had my appliance serviced, I have changed my fuel to Woodsure “Ready to Burn” approved suppliers	1	1.5
Total 3 method	7	10.4
I have had my chimney swept, I have had my appliance serviced, I use my appliance less regularly, I have stopped using an unsuitable fuel in my appliance (e.g. treated wood, wet wood, household waste)	1	1.5
I have had my chimney swept, I have had my appliance serviced, I have changed my fuel to Woodsure “Ready to Burn” approved suppliers, I have seasoned my wood for longer than I have previously	1	1.5
Total 4 method	2	3.0
I have had my chimney swept, I have had my appliance serviced, I use my appliance less regularly, I have stopped using an unsuitable fuel in my appliance (e.g. treated wood, wet wood, household waste), I have changed my fuel to Woodsure “Ready to Burn” approved suppliers	1	1.5
Total 5 method	1	1.5
All of the above	1	1.5
Total 1 or more	55	82.1

Survey invite letters:

Environmental Protection Team
County Hall, Colliton Park, Dorchester, DT1 1XJ
01305 221000
www.dorsetcouncil.gov.uk

Address

Date: 03 November 2022
Ref: Air Quality Survey
Officer: Environmental Protection
01305 221000
envhealth@dorsetcouncil.gov.uk

Dear Household

Dorset Council's Environmental Protection team is responsible for monitoring pollution levels in Dorset.

Earlier this year, the team were awarded funds from Defra to investigate air pollution, particularly the levels of particulate matter emissions across the Dorset Council area.

What are we doing?

As part of this project, we will be setting up **a monitoring station** in your area to help us record and analyse different particulate matter emissions in the air. To help inform our study we have compiled **a short survey which we would like your household to be part of.**

Why should I take part?

To accurately analyse data we collect, we need a better understanding of the types of heating fuel being burnt in houses surrounding our monitoring pods. Any information you can provide will help us understand what is (and isn't) impacting on air quality in your area.

Who can take part?

Only one response is needed per household. We ask that one adult over the age of 18 responds on behalf of your whole household.

How do I take part?

Please type the link below into your internet browser, or scan the QR code, to access our online survey.

www.dorsetcouncil.gov.uk/air-quality-survey

The survey should take around **5 minutes**, and on completing your household will have the opportunity to enter a prize draw for a **£100 shopping voucher** (terms and conditions apply).

By taking part, you will play a valuable role in helping us make sure air quality in Dorset remains high. Any information you provide us with is protected by law and will be treated as confidential.

If you would like to request a paper copy of the survey or have any questions, please contact us.

Thank you for your time.

Yours faithfully,

Janet Moore - Service Manager Environmental Protection, Dorset Council


Dorset Council
Published by Orlo · Just now ·
Do you use a wood burning stove or fireplace?
If so, we invite you to take part in our survey
http://orlo.uk/dorset-council-survey_xxxxx
As part of a Defra funded project, we're looking to better understand the types of fuels being used to heat homes in your area.
Survey results will be added to our study and also help with work being done across the country.
By taking part in the survey you will also help us identify what support is needed to help residents increase the efficiency of their solid-fuel burning whilst reducing its impact on air quality.
Like
Comment
Share

Appendix 5: Promotional Materials and Publications

Air Quality Awareness Comms Campaign – evaluation

Comms activity log/metrics:

Activity	Channel	Evaluation metrics	Notes
Raise awareness of the project amongst target households	• Dorset Council website • Email to local ward members • Email to town and parish councils • letters to 'target households' (letter 1)	Letter 1 metrics below	
Launch solid-fuel burning survey (opening survey)	• citizen space survey • Dorset Council website	**Days survey open for:** 02 Nov 22 – 31 Jan 23	
Encourage participation in survey	• Letter to 'target households' • Social media (organic and paid for) • Email to local ward members • Email to town and parish councils • Prize draw incentive	**Letters sent to households (letter 1):** 1,689 **Facebook advert (14 Nov – 22 Dec)** • Total ad impressions: 55,377 • Total ad reach: 10,244 • Links clicked: 593 • Total spend: £210.77 **No. of survey responses:** 360	View letter 1 View sample Facebook advert
Promote community engagement events	• printed posters at key contact sites • social media (paid for and organic) • emails to 'target households' • Events webpage – Eventbrite / Dorset Council website • Email to town and parish councils • Featured in local 'what's on' directories • Email to local community groups	**No. of Facebook events created:** 3 **No of Facebook adverts:** 3 • **Reach:** 6,312 • **Event responses:** 41 **No. of email invites sent:** 547 • **No. of opens:** 315 / 58% • **No. of clicks:** 13 / 2.4%	View poster View sample Facebook post View email

Deliver community engagement events	• Face-to-face events	**No. of events hosted:** 3 **No. of attendees:** 100	
Share advice and best practice in relation to solid fuel burning	• Social media posts (incl. sharing Defra / Hetas content) • Solid fuel burning advice page – Dorset Council website • Letter to 'target households' • Email to 'target households'	**No. of social media posts:** 7 **Webpage metrics:** • **Views:** 93 • **Active users:** 62 **No. of letters sent (letter 2):** 1,689 **No. of emails sent:** 535 • **No. of opens:** 282 / 53% • **No. of clicks:** 30 / 5.6%	View sample Facebook post View sample Instagram post View letter 2 View email
Launch household fuel survey (closing survey)	• citizen space survey • Dorset Council website	**Days survey open for:** 25 Jul 24 – 30 Sept 24	
Encourage participation in survey	• Letter to 'target households' • Social media • Email to local ward members • Prize draw incentive	**No. of letters sent to households (letter 3)**: 1,689 **No. of social posts relating to survey**: 3 • **No. of impressions:** 483 impressions **No. of survey responses:** 286	View letter 3 View sample NextDoor post

Full breakdown of metrics:

Opening survey

- **Days survey open for:** 02 Nov 22 – 31 Jan 23
- **No. of letters sent to households**: 1,689
- **No. of Facebook adverts:** 1 (14 Nov – 22 Dec)
  - **Total impressions**: 55,377
  - **Total reach**: 10,244
  - **Links clicked**: 593
  - **Total spend**: £210.77

- **No. of survey responses:** 360

Community events

- **No. of events hosted:** 3
- **No. of attendees:** 100
- **No. of Facebook events created:** 3
- **No of Facebook adverts: 3**
  - **Reach:** 6,312
  - **Event responses:** 41
- **No. of email invites sent:** 547
  - **No. of opens:** 315 / 58%
  - **No. of clicks:** 13 / 2.4%
- **No. of feedback forms submitted:** 8

Solid fuel burning advice sharing

- **No. of web pages created:** 1
  - **No. of page views:** 93
  - **No. of unique visitors:** 62
- **No. of social media posts:** 7
  - Instagram (reach: 1,514)
  - X
  - Facebook (shared to community groups, reach unknown)
- **No. of letters sent to households:** 1,689
- **No. of emails sent:** 535
  - **No. of opens:** 282 / 53%
  - **No. of clicks:** 30 / 5.6%
  - **Most clicked link:**
    - Listed building guidance = 10
    - Healthy homes Dorset website = 8
    - Hetas advice hub = 8
    - Dorset Council EV webpage = 7
    - Feedback survey = 6
    - Burn better gov website = 6
    - DC climate pages / our plan = 2

Closing survey

- **Days survey open for:** 25 Jul 24 – 30 Sept 24
- **No. of letters sent to households**: 1,689
- **No. of social posts relating to survey**: 3 (Nextdoor)
  - **No. of impressions:** 483 impressions
- **No. of survey responses:** 286

Dorset Council
7 March ·

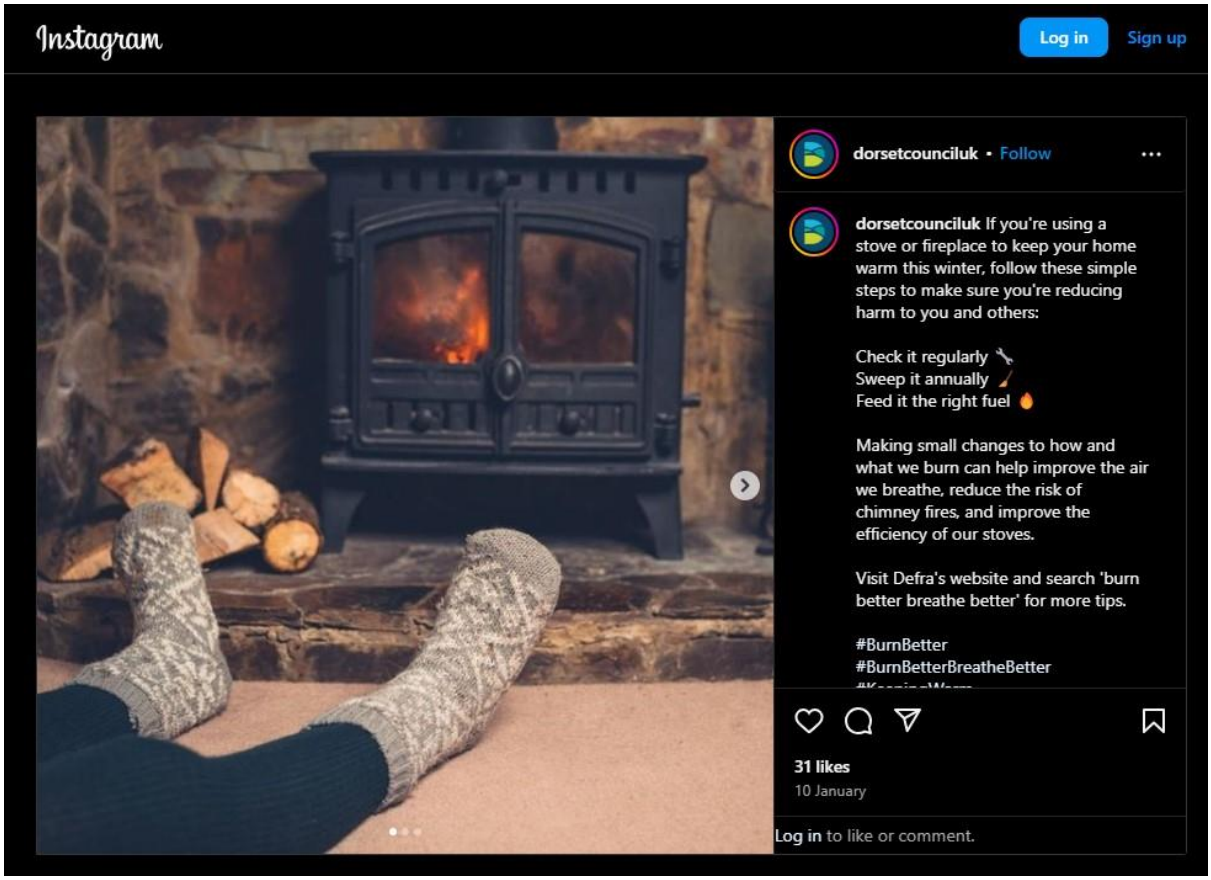
If you use a stove or open fire in your home, these simple steps from Defra can help you burn better for the environment, the community, and for your health 👇

- Check it regularly
- Sweep it professionally
- Feed it the right fuels

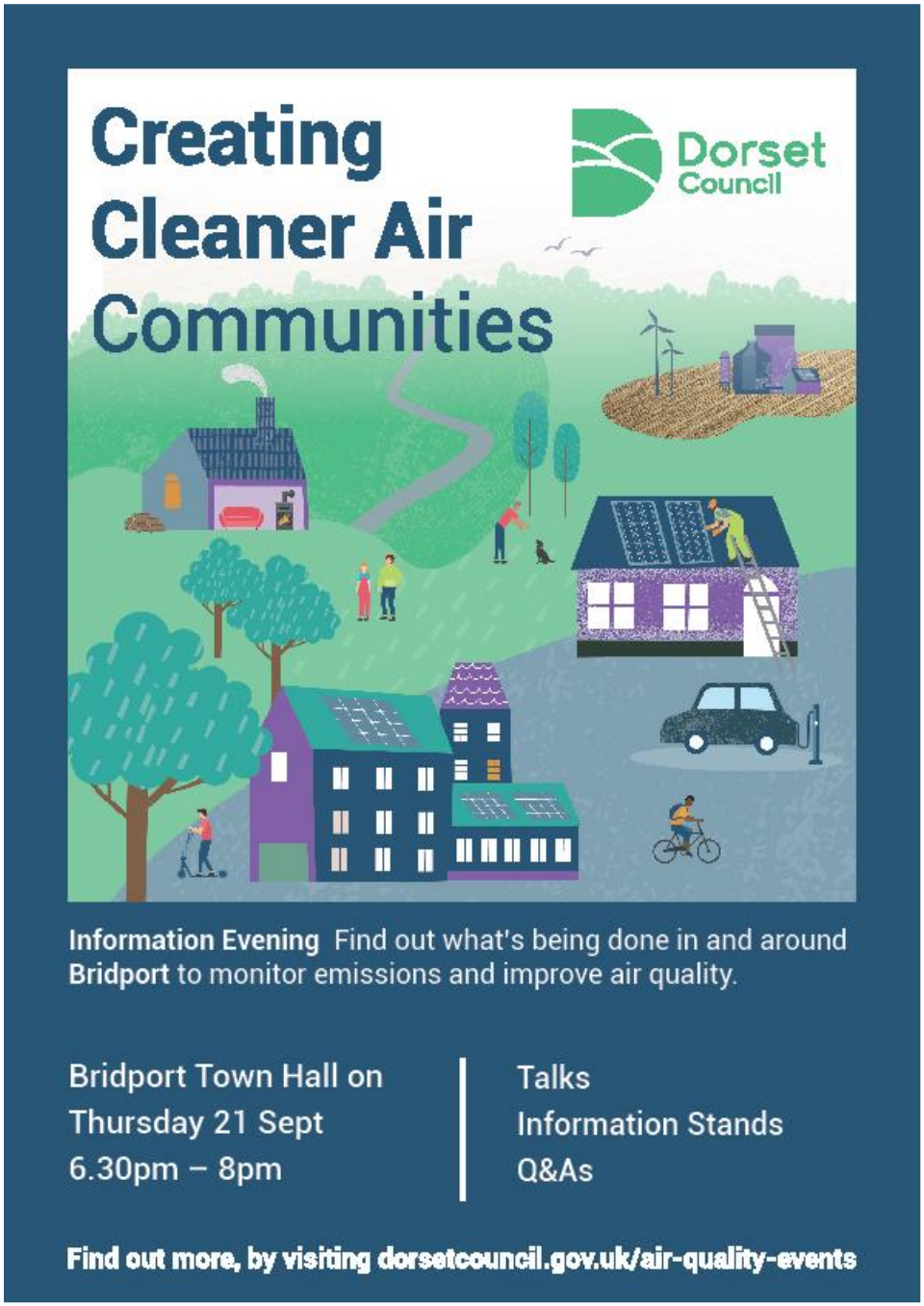
Good burning habits can also help your stove or open fire perform better, which means it will use less fuel and give off more heat 🔥

Learn more at https://uk-air.defra.gov.uk/library/burnbetter

#BurnBetter #BurnBetterBreatheBetter



Creating Cleaner Air Communities Advertising


Creating
Cleaner Air
Communities
Dorset Council
Information Evening Find out what's being done in and around Bridport to monitor emissions and improve air quality.
Bridport Town Hall on
Thursday 21 Sept
6.30pm – 8pm
Talks
Information Stands
Q&As
Find out more, by visiting dorsetcouncil.gov.uk/air-quality-events

Creating Cleaner Air Communities Leaflets

Department for Environment Food & Rural Affairs

How to get the most from your stove or open fire

A guide to buying, storing and seasoning wood

Burning wood can be a great source of heating for some rural homes. To get the most out of your wood fuel it needs to be dried and ready to burn. This will help you to:

- Get the most heat out of your stove or open fire
- Maximise efficiency, meaning you will burn less fuel
- Reduce the risk of chimney fires
- Reduce air pollution which is harmful to you and your neighbours

Most modern stoves are efficient, well designed pieces of equipment. The fire box and air flow controls are designed to get the most out of woodfuel with a moisture content of up to and including 20%.

Unseasoned or wet wood can:

- Be difficult to light or keep alight
- Damage your grate or stove, tarring the inside and blackening the glass
- Allow more tar and soot to accumulate in your chimney increasing maintenance costs and risk of chimney fire
- Create a lot of smoke
- Produce less heat

Green or freshly felled logs are not suitable for burning in a domestic stove or open fire until they have been dried to 20% moisture content or less.

burn right

woodsure READY TO BURN

More information on **regional** regulations & guidance at:
www.hetas.co.uk

LEAFLET NO.1 - Before Your Puchase HETAS Consumer Advice

QUICK CHECKLIST

(1) For the best advice, appliance quality and to stay safe **HETAS** recommend:
- Using a **HETAS Approved Retailer** showroom to buy your stove
- Purchasing a **HETAS Approved Appliance**
- Using a **HETAS Registered Installer** to fit your stove
- A **HETAS Registered Installer** or **HETAS Approved Servicing technician** to service your appliance annually
- A **HETAS Approved Chimney Sweep** to clean & maintain your chimney

(2) Ask **your solid fuel professional** for their **HETAS ID** to ensure they're registered and competent to carry out the required work

(3) Make sure the installation complies with **Building Regulations**: confirm this with the **HETAS Registered Installer** who commissioned your appliance

Once your new appliance, along with any associated systems has been fitted, please make sure you read our two other important Consumer Advice Leaflets before use:
After Your Purchase & **Protect Yourself from Carbon Monoxide**

Visit us online at **www.hetas.co.uk**
Call HETAS on **01684 278170**
Send an email to **Info@hetas.co.uk**

HETAS, Severn House, 5 Newtown Trading Estate, Green Lane, Tewkesbury GL20 8HD

Do I need my Chimney Lined?

The answer to this is often yes. Chimneys are lined for various safety-related reasons - newer chimneys may not require relining, but systems pre-dating 1965 often require a modern lining solution if:

- **The flue has lost integrity, causing smoke leaks**
- **Condensates or tar deposits are seeping through the chimney, causing staining to the building**
- **Lining with insulation needs to be added to improve appliance & flue operation, especially when the chimney is exposed to the outdoors on any of its walls.**
- **Defective flue systems may be eroded & coarse, causing resistance to flow of gases & resulting in poor updraught**
- **Larger chimneys/flues may affect appliance performance and require reduction in size. Some manufacturers specify smaller flues to operate more efficiently**

A chimney needs to remove all combustion products safely to the outside of the building. It works because the hot gases rise to escape to the cooler air outside. Factors such as running the appliance at a very slow rate or cold air leaking into the flue cool the gases and may affect chimney performance.

Lining Systems can replace flues in existing chimneys. Insulation may need to be added or integrated to improve draught efficiency - particularly for external situations. **We recommend you use a HETAS Registered Installer to carry out any lining work.**

Although Building Regulations do not require all existing chimneys to be lined, the installer must be satisfied a chimney is safe for use and may need to use a liner to achieve this.

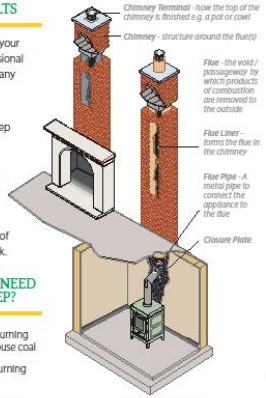
Any work on a chimney, including its liner in conjunction with installing a heating appliance must be undertaken by a Competent Person or approved by your local Building Control by law.

Any fireplace alteration carried out to make it suitable for use with another fuel e.g. gas to solid fuel is subject to Building Regulations.

CHIMNEY FAULTS

Before installing a liner, get your chimney swept by a professional chimney sweep to remove any soot and tar deposits.

If you already have a liner installed, a competent sweep can inspect for faults. Faults with a chimney and its liner can lead to various problems with the operation of a solid fuel appliance, and more importantly, put the safety of household occupants at risk.



HOW OFTEN DO I NEED TO USE A SWEEP?

- At least twice a year if burning wood or bituminous house coal
- At least once a year if burning smokeless fuels.

The best times to get a chimney swept are just before the heating season and after an extended period of shut-down.

If sweeping twice a year, the second time should be after the peak heating season.

FIND A SWEEP

For your nearest HETAS Approved Chimney Sweep, call **01684 278170** or use our search:
www.hetas.co.uk/find-chimney-sweep

Cover photo courtesy of Carlfred Fireplaces Ltd - Stockingham Eco

More information on **regional** regulations & guidance at:
www.hetas.co.uk

LEAFLET NO.2 - After Your Puchase HETAS Consumer Advice

QUICK CHECKLIST

(1) After fitting your stove, make sure your **HETAS Installer** has given you a:
- **certificate of compliance** or you have been told it will arrive in the post
- **notice plate** fitted and shown you where it is located
- copy of the **manufacturer's instructions** and
- **CO alarm** fitted correctly and informed you what to do if it activates

(2) Upon completion of the installation your installer will commission your appliance and provide you with a handover, including how to use it safely.

(3) Ask your **Approved Fuel Supplier** the questions listed in this leaflet.

(4) Primarily refer to **Manufacturer's Instructions** to operate an appliance. If topics are not covered or lack detail then use these leaflet guidelines.

(5) Observe our tips for **Staying Safe** & **Using and Maintaining your Stove**.

Please read our other important Consumer Leaflets before using your new stove:
Before Your Purchase & **Protect Yourself from Carbon Monoxide**

Visit us online at **www.hetas.co.uk**
Call HETAS on **01684 278170**
Send an email to **Info@hetas.co.uk**

HETAS, Severn House, 5 Newtown Trading Estate, Green Lane, Tewkesbury GL20 8HD

Staying Safe

Always use a **HETAS Registered Installer** or **HETAS Approved Servicing** technician for maintenance - they will spot problems and complete all work safely, in compliance with regulations.

Make sure you have a compliant Carbon Monoxide Alarm fitted before using your stove. Your **HETAS Registered Installer** should fit this. HETAS Advice Leaflet: **Protect Yourself from Carbon Monoxide** has more information.

Make sure you follow our safety checklist:

- **Always use the fuel recommended by the manufacturer for your type of appliance.**
- **Keep all combustibles, including logs, at a safe distance from a hot stove and hearth**
- **Keep permanent air ventilation grills clear at all times**
- **Do not "turn down the stove for the night" / slumber burn an appliance unless it is specifically designed to operate this way - refer to the manufacturer's instructions.**
- **Never leave an open fire unattended without a spark guard.**
- **Always use a securely fitted fireguard if the young, elderly or infirm are in the house.**
- **Have your appliance serviced regularly by a HETAS Registered Installer or HETAS Approved Servicing technician in accordance with Manufacturer's instructions (if instructions do not cover this, service at least once a year).**
- **We recommend contacting your insurer about your new stove as it may affect your insurance policy e.g. for thatched properties.**

Also remember to get your chimney swept at least **twice a year** when burning wood or bituminous house coal or if burning smokeless fuels at **least once a year**. For further details, see our leaflet "Before Your Purchase" or: **www.hetas.co.uk > Homeowner > FAQs**

HOW TO LIGHT A WOOD BURNING STOVE

Lighting a stove effectively takes practice - these steps provide good guidelines

1) **Fully open the primary air vent/ control and airwash controls**
2) **Light your fire. See an illustrated step-by-step guide to start a fire at: www.hetas.co.uk/lighting-a-fire**
3) **Leave the door ajar while the fire establishes and glass warms up. This helps avoid condensation build up.**
4) **Once the fire is going, add larger wood pieces (do not fill the chamber)**
5) **When the fire is established, close the door completely**
6) **Reduce primary air control to desired heat setting**
7) **If required, set the secondary air wash system to the desired setting**
8) **Maintain the fire frequently with small amounts of additional fuel**

LIGHT A MINERAL FUEL STOVE

1) **Start with a firelighter and a small amount of coal**
2) **Set main air control to maximum and any secondary controls to minimum unless manufacturer's instructions state otherwise.**
3) **Once the original fuel is fully alight, start building up the fuel in the grate without overfilling the chamber**
4) **Reduce the air intake once the whole bed of fuel is burning well**
5) **Add more fuel at a frequency that keeps a good bed of red hot coals**

BURN EFFICIENCY

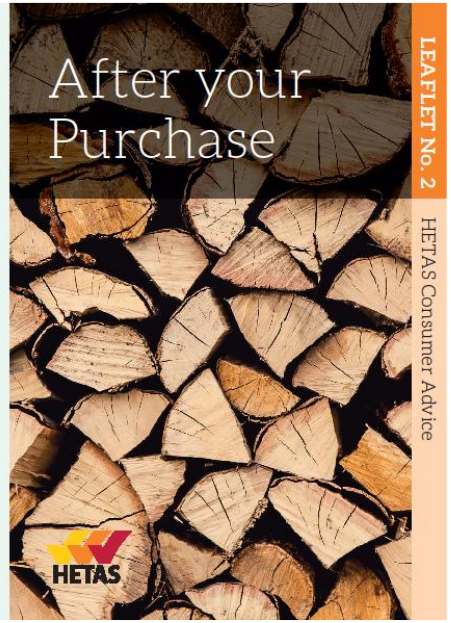
In the first instance always refer to your stove instruction manual - the following only gives general guidance:

An efficient burn of fuel providing heat to the room requires three things:

1) **Time - the combustion process needs time to occur. Incomplete combustion results in more smoke and carbon monoxide in flue gases - this both wastes energy and increases emissions**
2) **Turbulence - arrange fuel in a way that allows air and combustion gases to mix, without overfilling the appliance**
3) **Temperature - solid fuel burns efficiently at high temperatures with negligible smoke. If the temperature is too low your fuel will produce more smoke and less heat to warm the room**

Keep your fire healthy - watch for:

- **Vigorous flames** - reaching the appliance exit - do not maintain a vigorous flame once the appliance is up to temperature
- **Lazy flames** - moving across the space within the stove
- **Red hot embers** - very efficient, but may need to add more fuel before the embers die down



Early Symptoms of CO Poisoning

Early symptoms of carbon monoxide (CO) poisoning can be similar to many common ailments and easily be confused with flu, viral infections, food poisoning, or simply tiredness. Symptoms include:

- **Headaches**
- **Stomach pains**
- **Nausea**
- **Drowsiness**
- **Erratic behaviour**
- **Dizziness**
- **Visual problems**
- **Chest pains**
- **Tiredness**
- **Vomiting**
- **Loss of consciousness**

What to Do If You Suspect a CO Escape

If you suspect fumes are escaping from your combustion appliance into your home, or your carbon monoxide alarm goes off:

- Where an appliance is automatically fed with fuel, **turn it off**
- **Open the doors and windows** and ventilate thoroughly
- **Leave the property** immediately and don't return until your appliance or boiler has extinguished and any CO has dispersed
- **If you feel unwell**, go to your doctor, call NHS Direct on 111 (0845 4647 in some areas) or if it is urgent phone 999 for an ambulance. Tell them you feel your symptoms may be related to carbon monoxide poisoning

Before you re-use the appliance, have it inspected and the chimney checked by a HETAS Registered Installer, HETAS Approved Servicing and Maintenance Technician or Approved Chimney Sweep. Do not use the appliance until you are told it is safe to do so.

Your installer may need to fit a wall ventilator for extra combustion air. HETAS have approved a selection of vents, available to view at **www.hetas.co.uk /find-appliance**

QUICK CHECKLIST

More information on **regional** regulations & guidance at:
www.hetas.co.uk

LEAFLET NO.3 - Protect Yourself from CO
HETAS Consumer Advice

(1) After fitting your stove, make sure your **HETAS Installer** has fitted a **carbon monoxide alarm** in a location that is compliant with Building Regulations.

(2) If you suspect a **CO escape** turn your combustion **appliance off, open doors and windows** and **leave property** immediately. If you feel unwell, go to a doctor, call NHS Direct on 111 or in an emergency phone 999 for an ambulance.

(3) A CO alarm is not a substitute for:

- **correct appliance operation ***
- regular & effective **chimney sweeping ***
- **correct appliance installation & maintenance *** by a HETAS Registered Installer or Approved Servicing Technician

* Always follow the manufacturer's instructions.

Please make sure you read our two other important Consumer Advice Leaflets before you use your new stove:
Before Your Purchase & **After Your Purchase**

Visit us online at **www.hetas.co.uk**
Call HETAS on **01684 278170**
Send an email to **Info@hetas.co.uk**

HETAS, Severn House, 5 Newtown Trading Estate, Green Lane, Tewkesbury GL20 8HD

HETAS

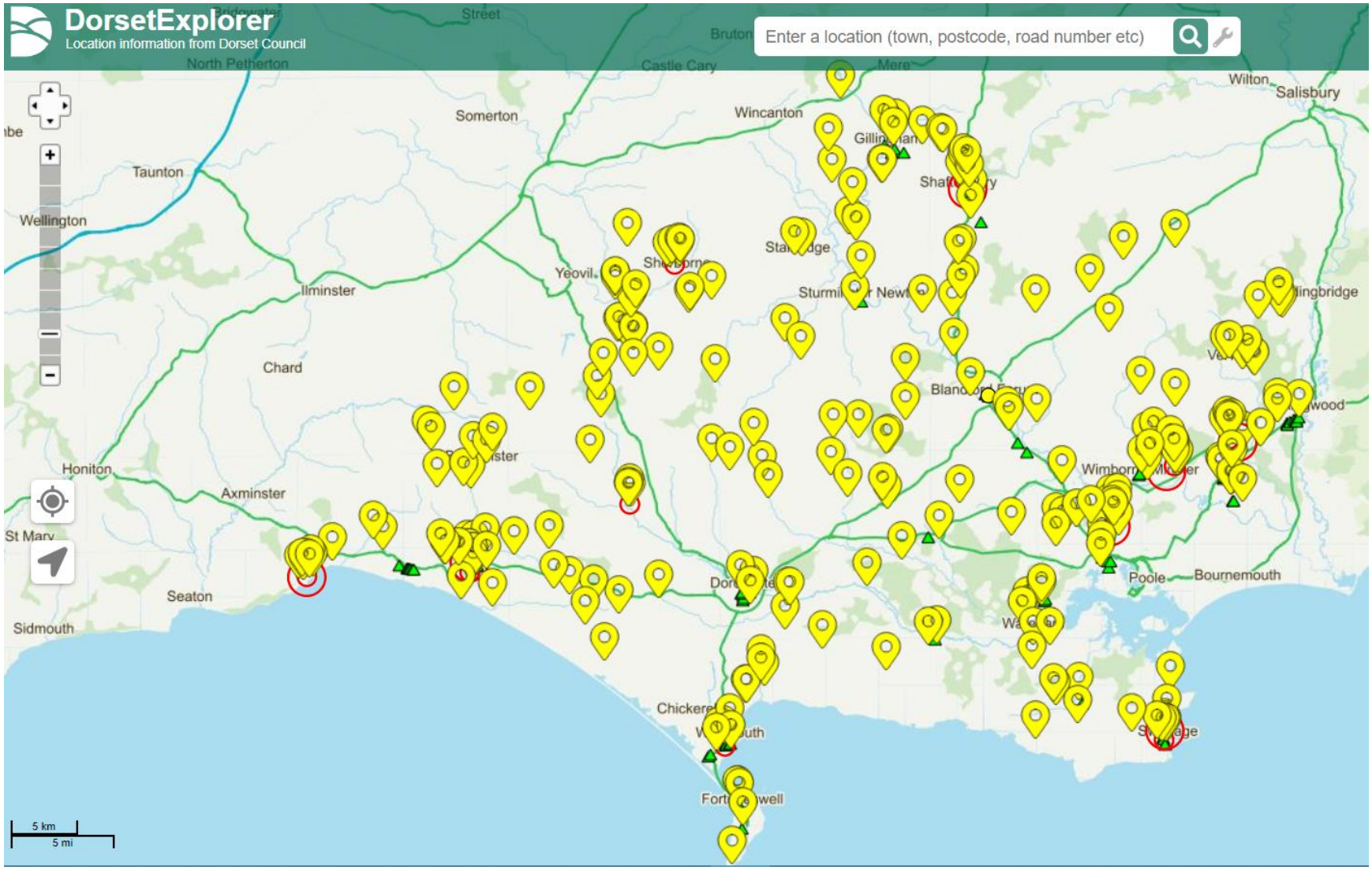
Protect Yourself from Carbon Monoxide

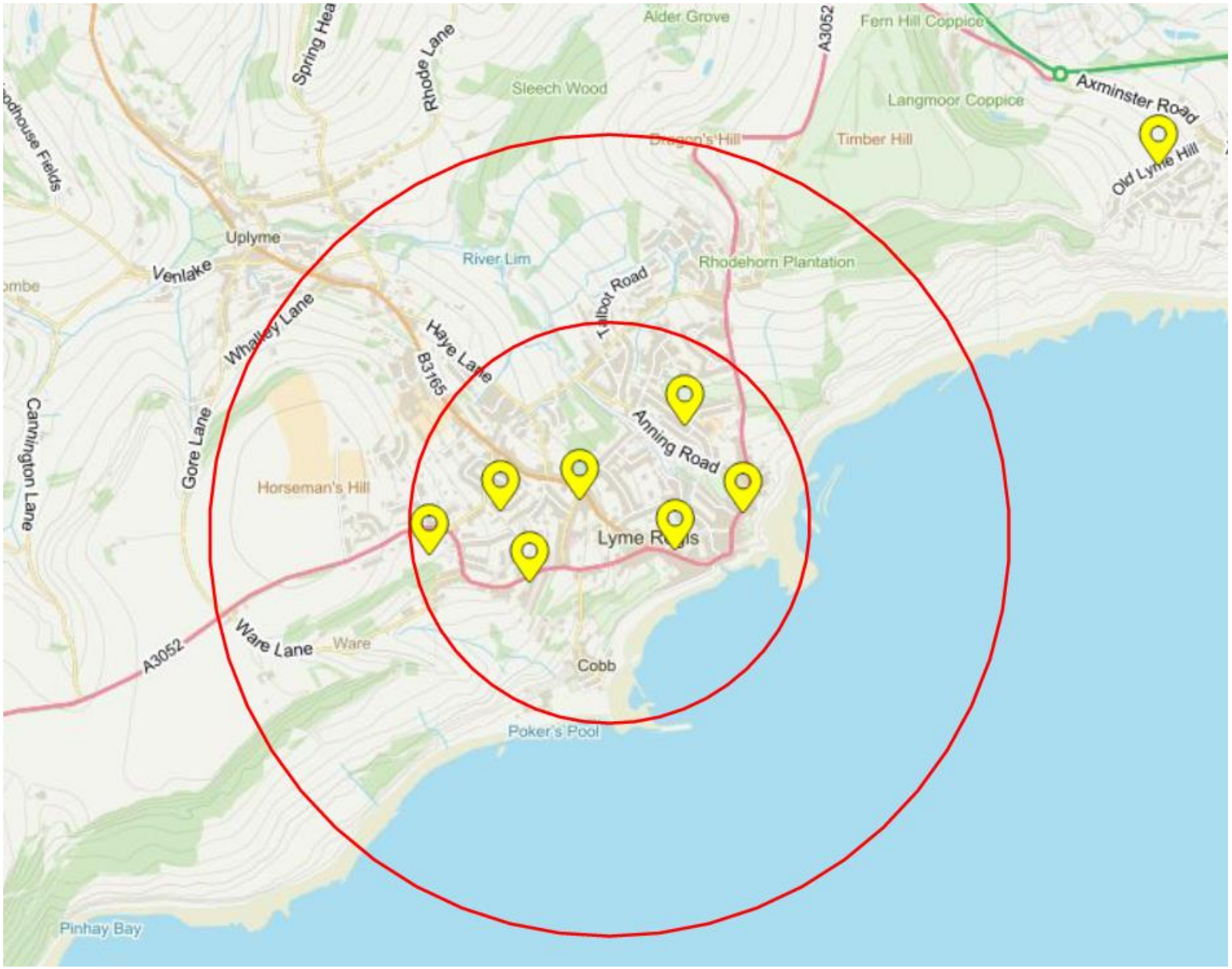
LEAFLET No. 3
HETAS Consumer Advice

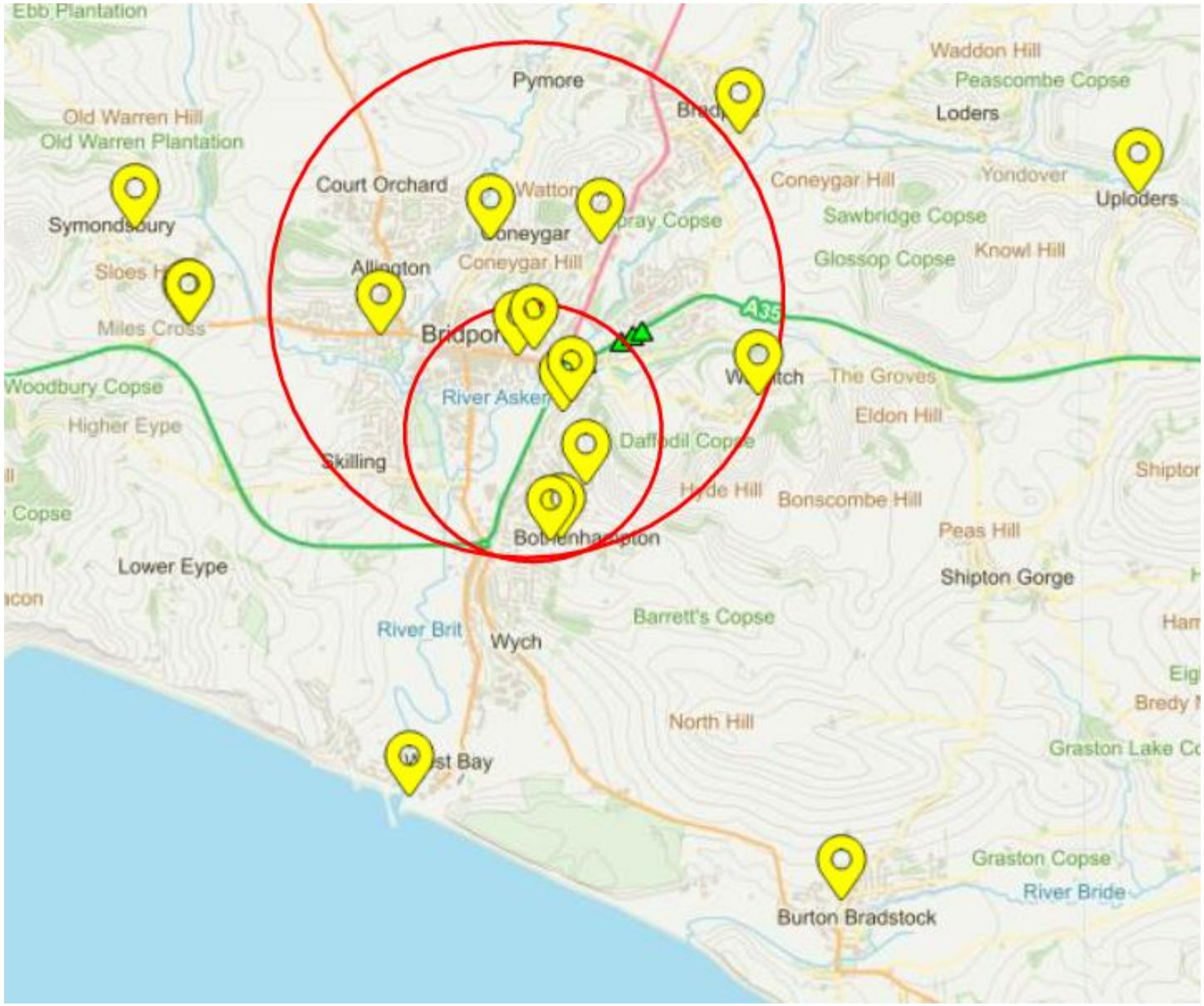
HETAS

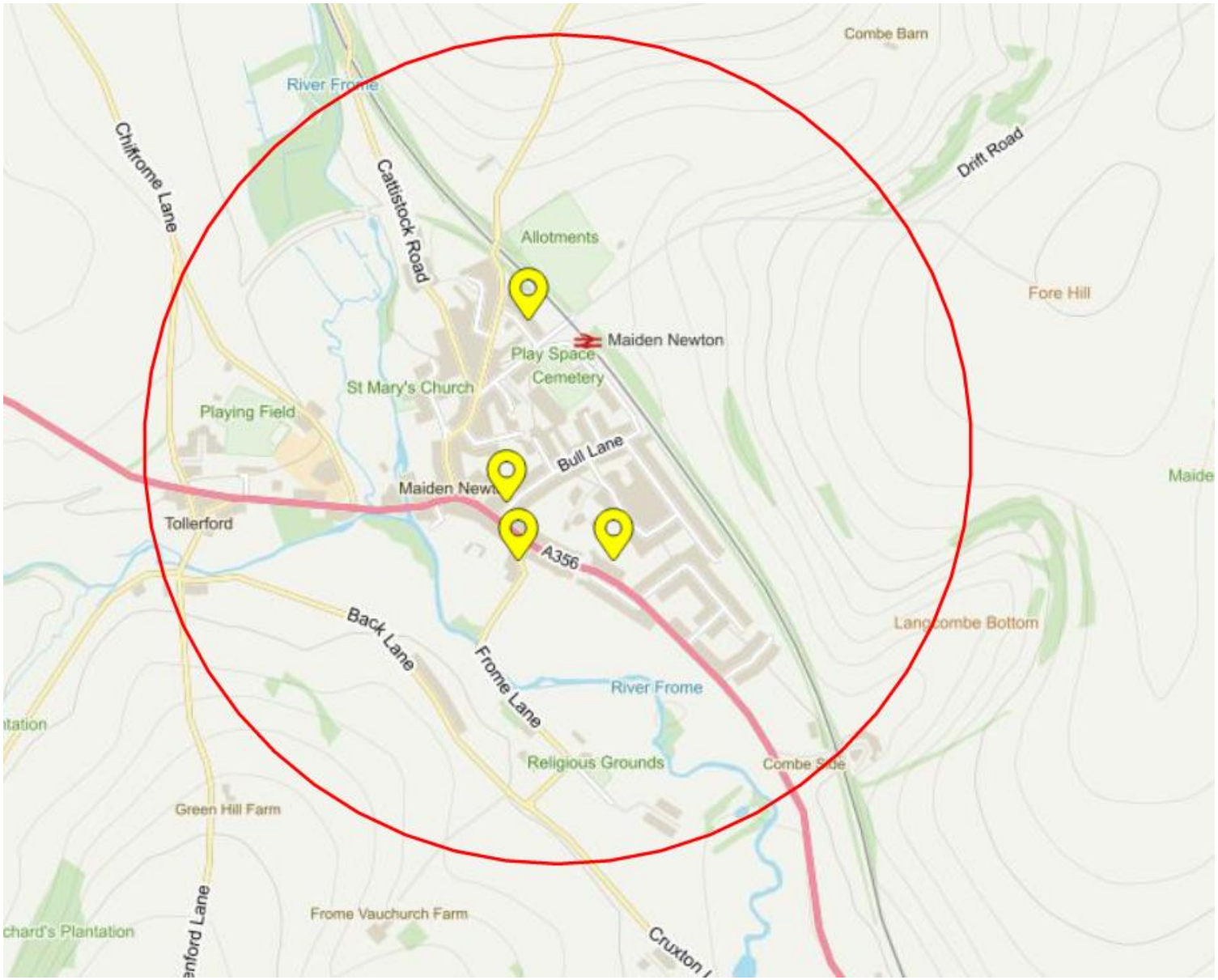
Appendix 6: AQMesh Pod Locations

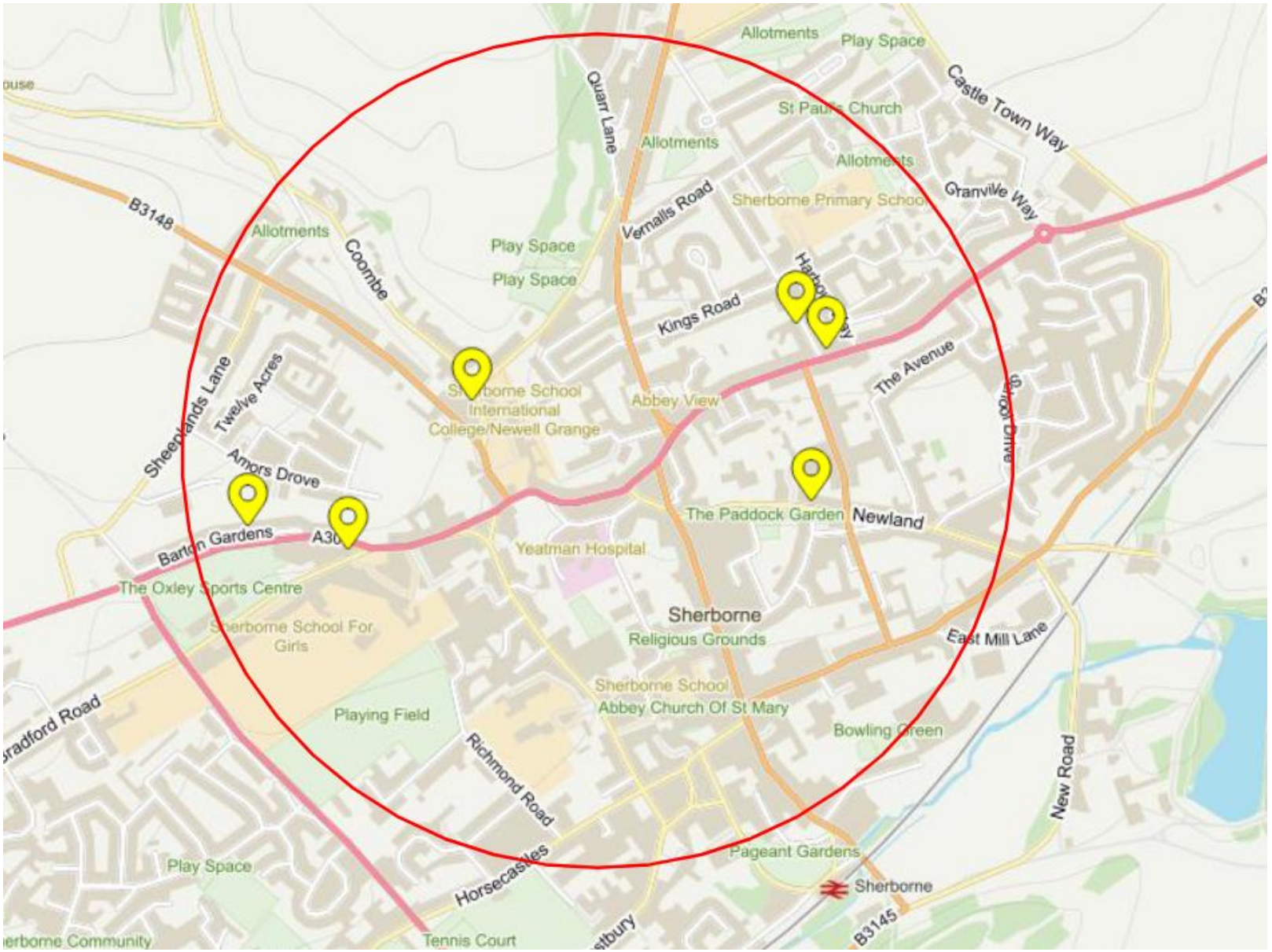
Known Woodburner Locations

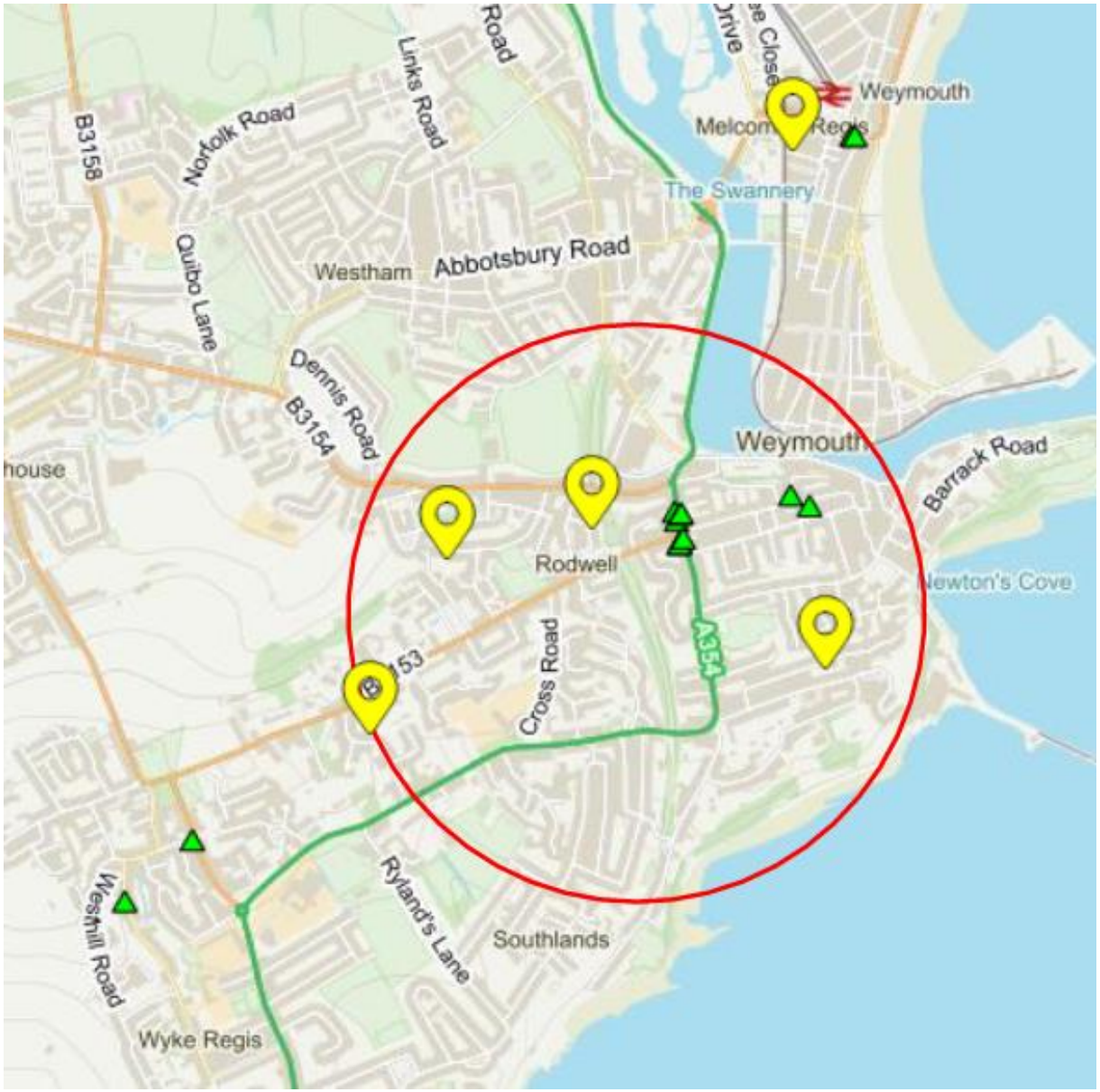


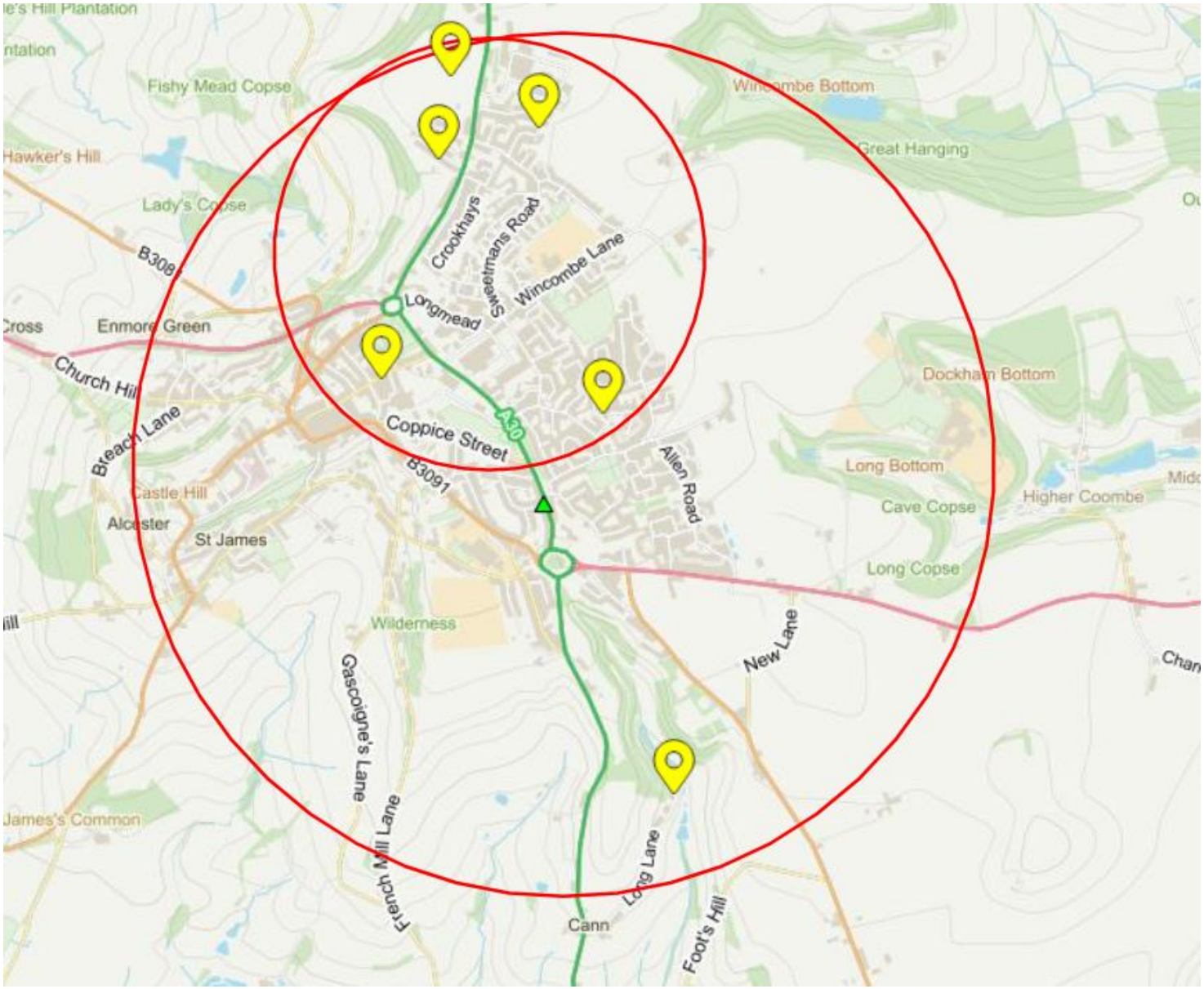

Alder Grove
Fern Hill Coppice
A3052
Axminster Road
Sleech Wood
Langmoor Coppice
Timber Hill
Old Lyme Hill
Uplyme
River Lim
Rhodehorn Plantation
Venlake
Whalley Lane
Talbot Road
Haye Lane
B3165
Gore Lane
Cannington Lane
Anning Road
Horseman's Hill
Lyme Regis
Ware Lane
Ware
A3052
Cobb
Poker's Pool
Pinhay Bay

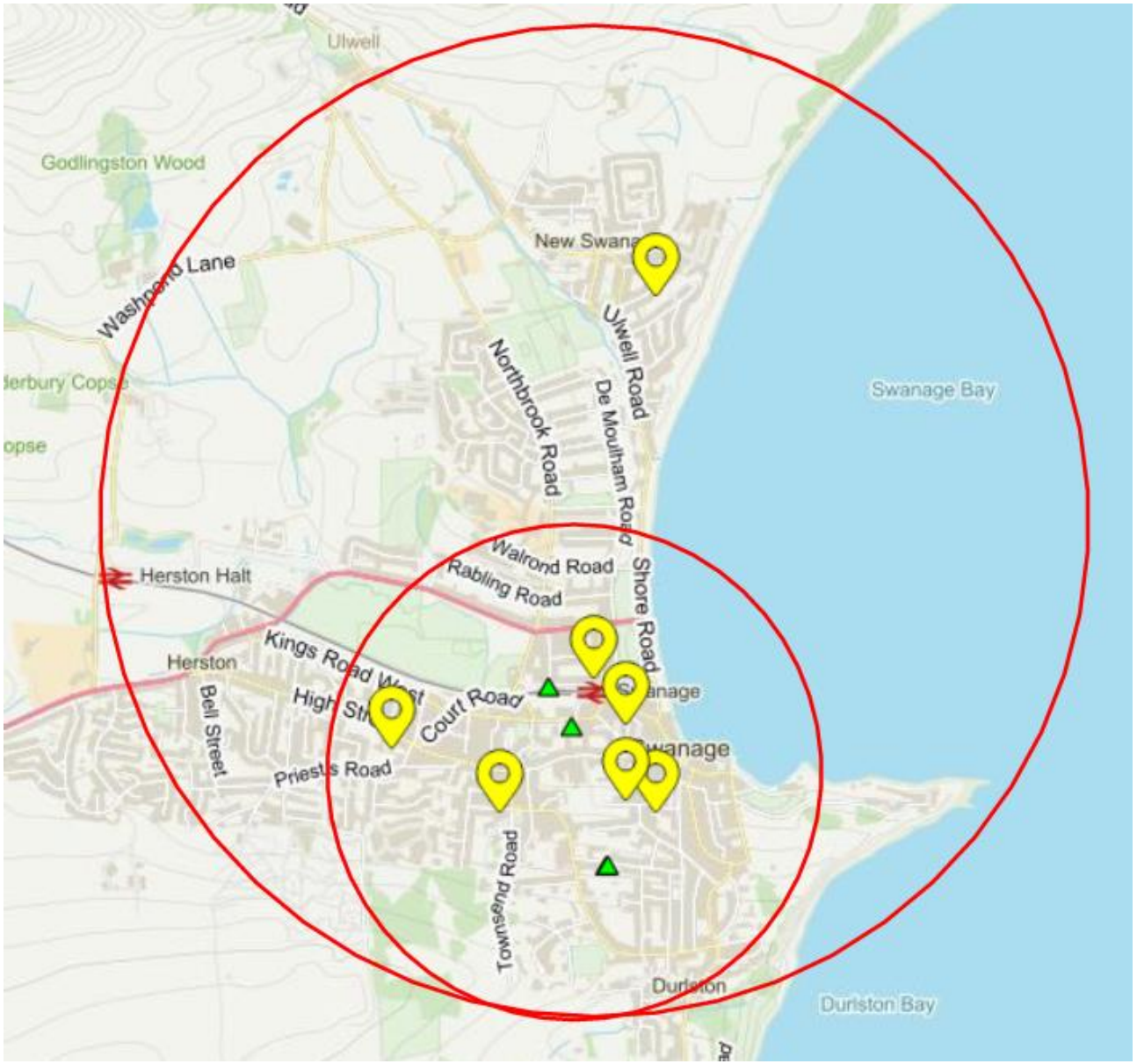

Ebb Plantation
Waddon Hill
Peascombe Copse
Pymore
Loders
Old Warren Hill
Old Warren Plantation
Court Orchard
Yondover
Uploders
Coneygar Hill
Sawbridge Copse
Symondsbury
Coneygar
Glossop Copse
Knowl Hill
Allington
Coneygar Hill
A35
Miles Cross
Bridport
The Groves
Woodbury Copse
River Asker
Eldon Hill
Higher Eype
Daffodil Copse
Skilling
Hyde Hill
Bonscombe Hill
Peas Hill
Lower Eype
Shipton Gorge
Barrett's Copse
River Brit
Wych
North Hill
Graston Lake
Graston Copse
River Bride
Burton Bradstock

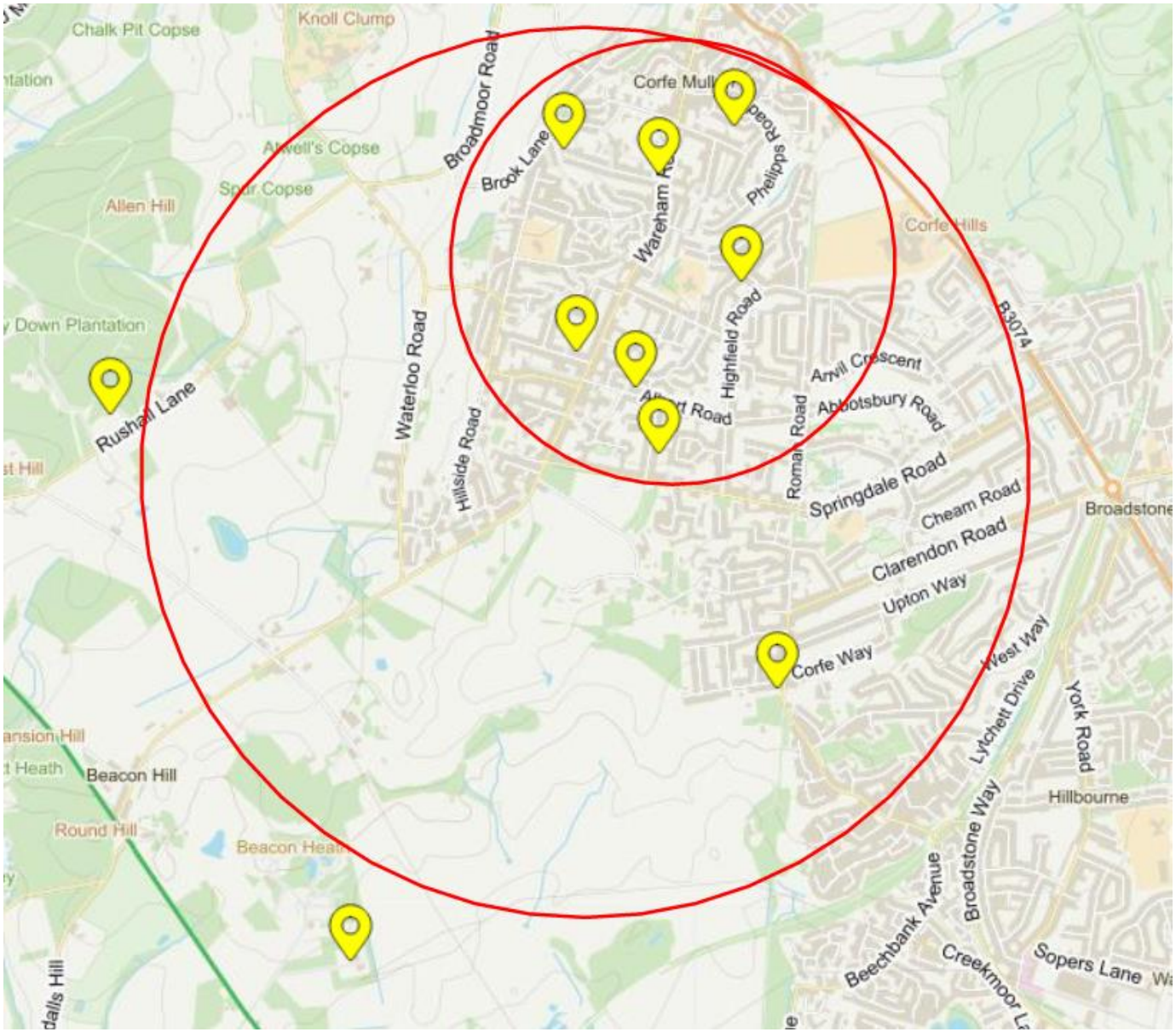

Combe Barn
River Frome
Chiltrome Lane
Cattistock Road
Drift Road
Allotments
Fore Hill
Maiden Newton
Play Space
Cemetery
St Mary's Church
Playing Field
Bull Lane
Maiden Newton
Tollerford
A356
Back Lane
Frome Lane
River Frome
Religious Grounds
Green Hill Farm
Frome Vauchurch Farm

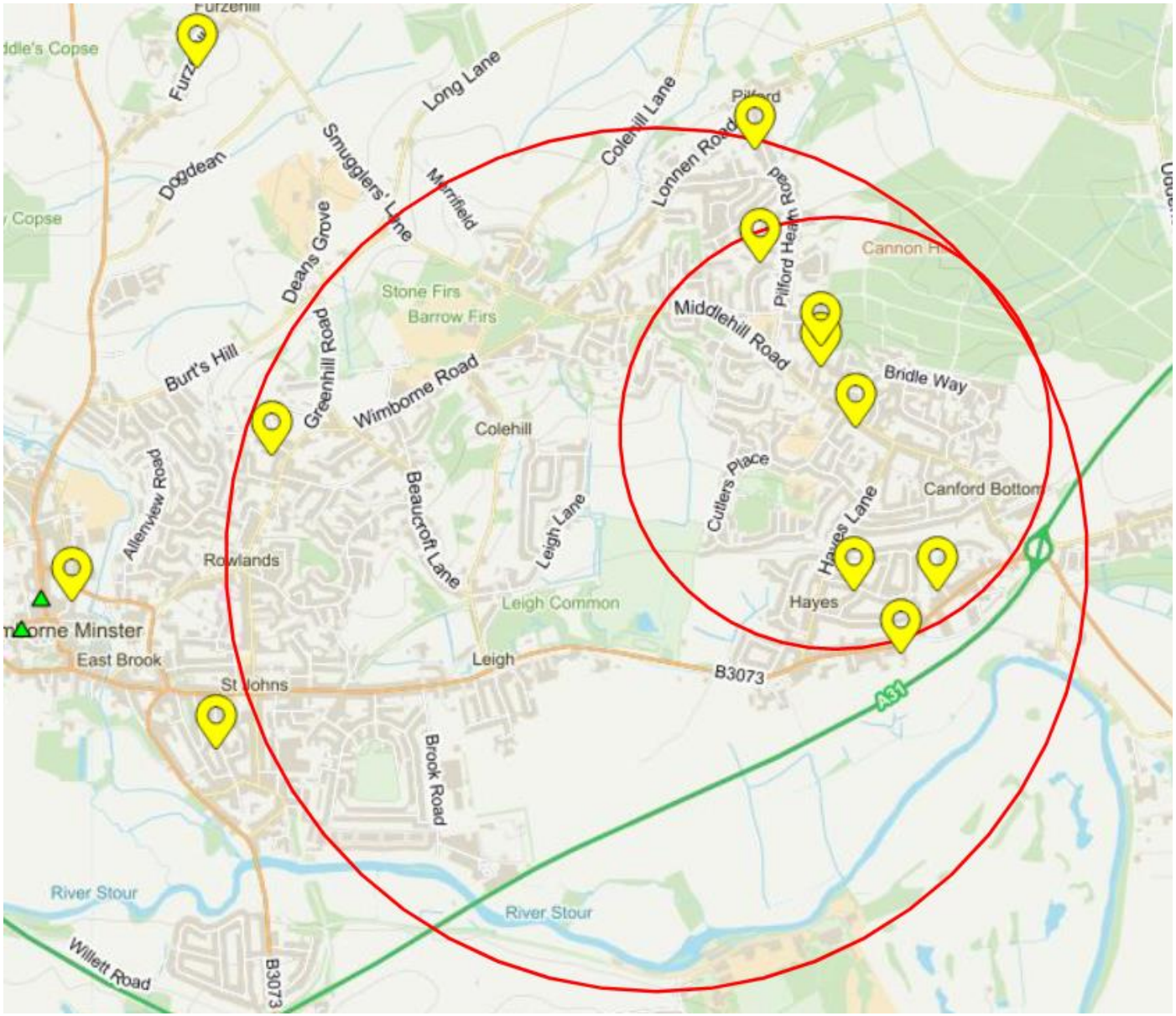

Allotments
Play Space
Castle Town Way
St Paul's Church
Quarr Lane
Allotments
Allotments
Granville Way
Sherborne Primary School
B3148
Allotments
Coombe
Play Space
Play Space
Vernalls Road
Kings Road
The Avenue
Sheeplands Lane
Twelve Acres
Abbey View
Sherborne School International College/Newell Grange
Amors Drove
The Paddock Garden
Newland
Barton Gardens
A30
Yeatman Hospital
The Oxley Sports Centre
Sherborne
Religious Grounds
Sherborne School For Girls
East Mill Lane
Sherborne School
Abbey Church Of St Mary
Playing Field
Bowling Green
Richmond Road
New Road
Pageant Gardens
Play Space
Horsecastles
Sherborne
Tennis Court
B3145

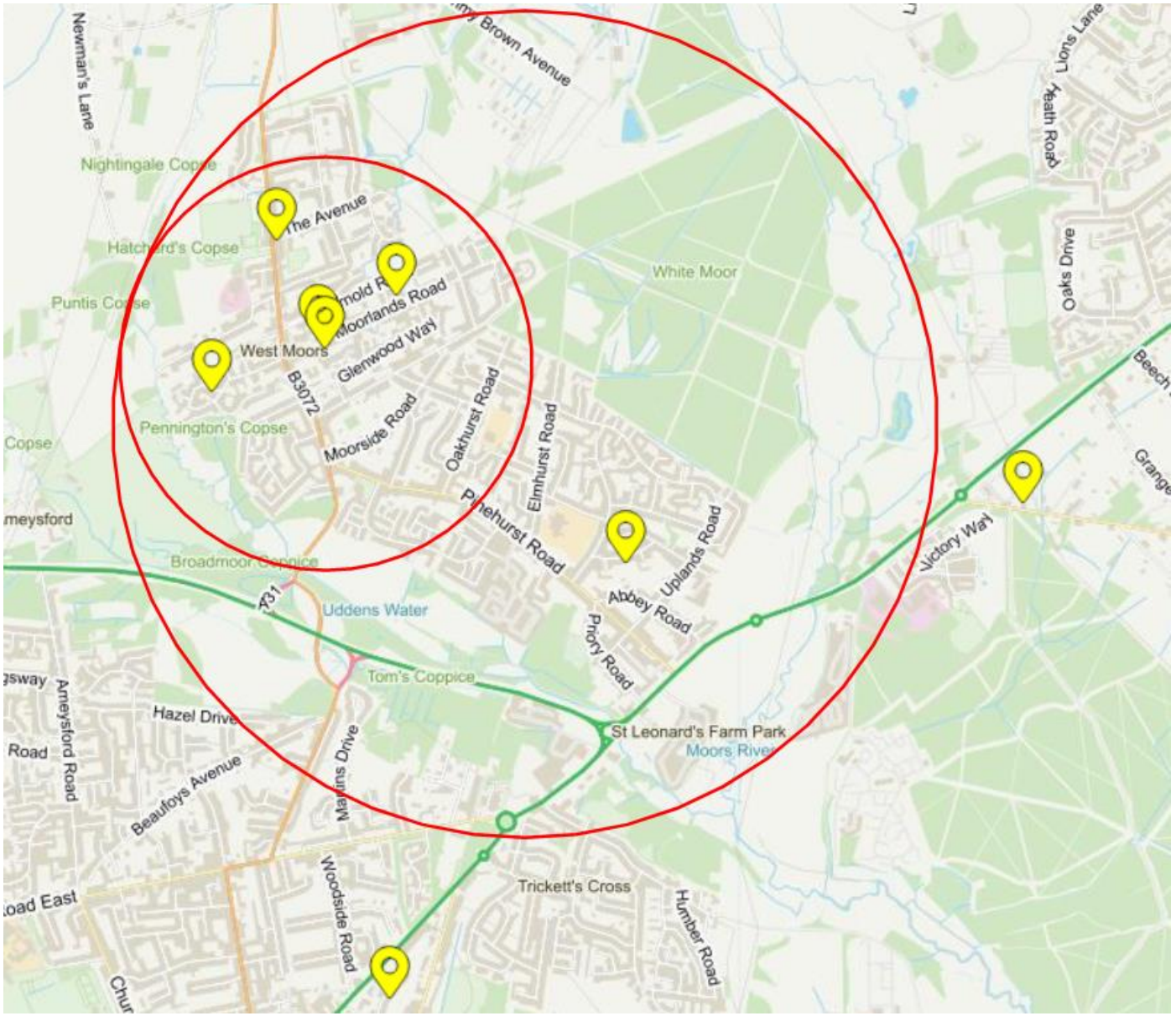

Weymouth
The Swannery
Abbotsbury Road
Westham
Quibo Lane
Dennis Road
B3154
B3158
Norfolk Road
Links Road
Weymouth
Barrack Road
Rodwell
Newton's Cove
A354
Cross Road
Ryland's Lane
Southlands
Westhill Road
Wyke Regis


Fishy Mead Copse
Hawker's Hill
Lady's Copse
B3089
Enmore Green
Church Hill
Breach Lane
Castle Hill
Alcester
St James
Crookhays
Sweetmans Road
Wincombe Lane
Longmead
Coppice Street
A30
B3091
Allen Road
Wilderness
Gascoigne's Lane
French Mill Lane
Cann
Long Lane
Foot's Hill
New Lane
Long Copse
Cave Copse
Long Bottom
Higher Coombe
Dockham Bottom
Great Hanging
Wincombe Bottom


Ulwell
Godlingston Wood
Washpond Lane
New Swanage
Ulwell Road
Northbrook Road
De Moulham Road
Swanage Bay
Herston Halt
Walrond Road
Rabling Road
Shore Road
Kings Road West
Herston
Court Road
Bell Street
Priests Road
Townsend Road
Durlston
Durlston Bay


Chalk Pit Copse
Knoll Clump
Broadmoor Road
Brook Lane
Corfe Mull
Phelipps Road
Allwell's Copse
Spar Copse
Allen Hill
Wareham Road
Corfe Hills
Down Plantation
Waterloo Road
Highfield Road
B3074
Rushall Lane
Hillside Road
Arnvil Crescent
Abbotsbury Road
Springdale Road
Cheam Road
Clarendon Road
Upton Way
Broadstone
Corfe Way
West Way
Lytchett Drive
York Road
Hillbourne
Beacon Hill
Round Hill
Broadstone Way
Beechbank Avenue
Creekmoor
Sopers Lane

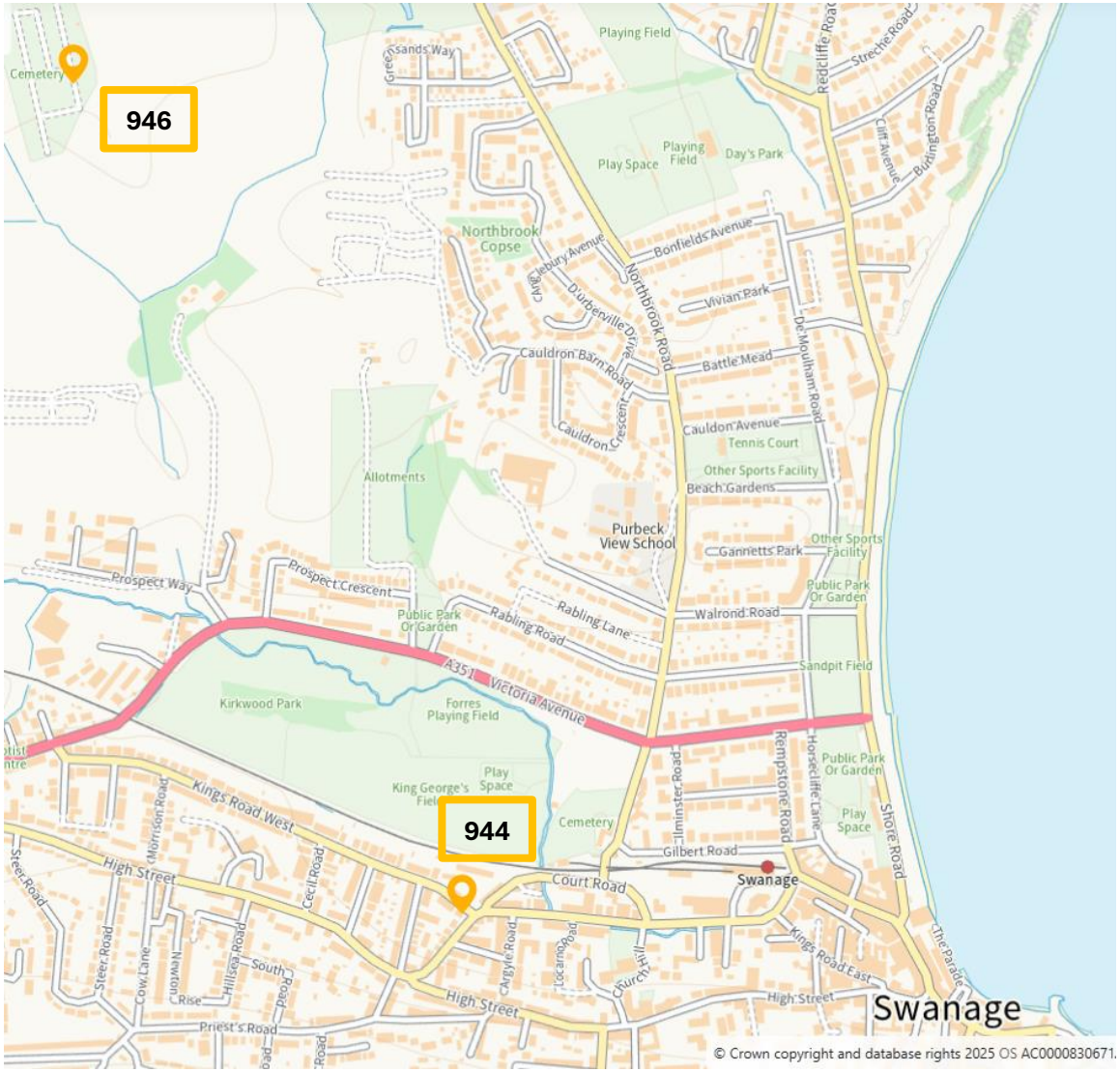

Long Lane
Colehill Lane
Lonnen Road
Pilford Heath Road
Smugglers' Lane
Merrifield
Deans Grove
Greenhill Road
Wimborne Road
Middlehill Road
Bridle Way
Cutlers Place
Hayes Lane
Canford Bottom
Hayes
Colehill
Stone Firs
Barrow Firs
Burt's Hill
Allenview Road
Beaucroft Lane
Leigh Lane
Rowlands
Leigh Common
East Brook
Leigh
B3073
A31
Brook Road
River Stour
Willett Road


Newman's Lane
Nightingale Copse
Hatchard's Copse
Puntis Copse
The Avenue
Moorlands Road
Glenwood Way
West Moors
B3072
Moorside Road
Oakhurst Road
Elmhurst Road
Pennington's Copse
Copse
Broadmoor Coppice
A31
Uddens Water
Tom's Coppice
Hazel Drive
Beaufoys Avenue
Meurs Drive
Woodside Road
Trickett's Cross
Humber Road
Priory Road
Abbey Road
Uplands Road
St Leonard's Farm Park
Moors River
White Moor
Oaks Drive
Victory Way
Lions Lane
Heath Road
Brown Avenue

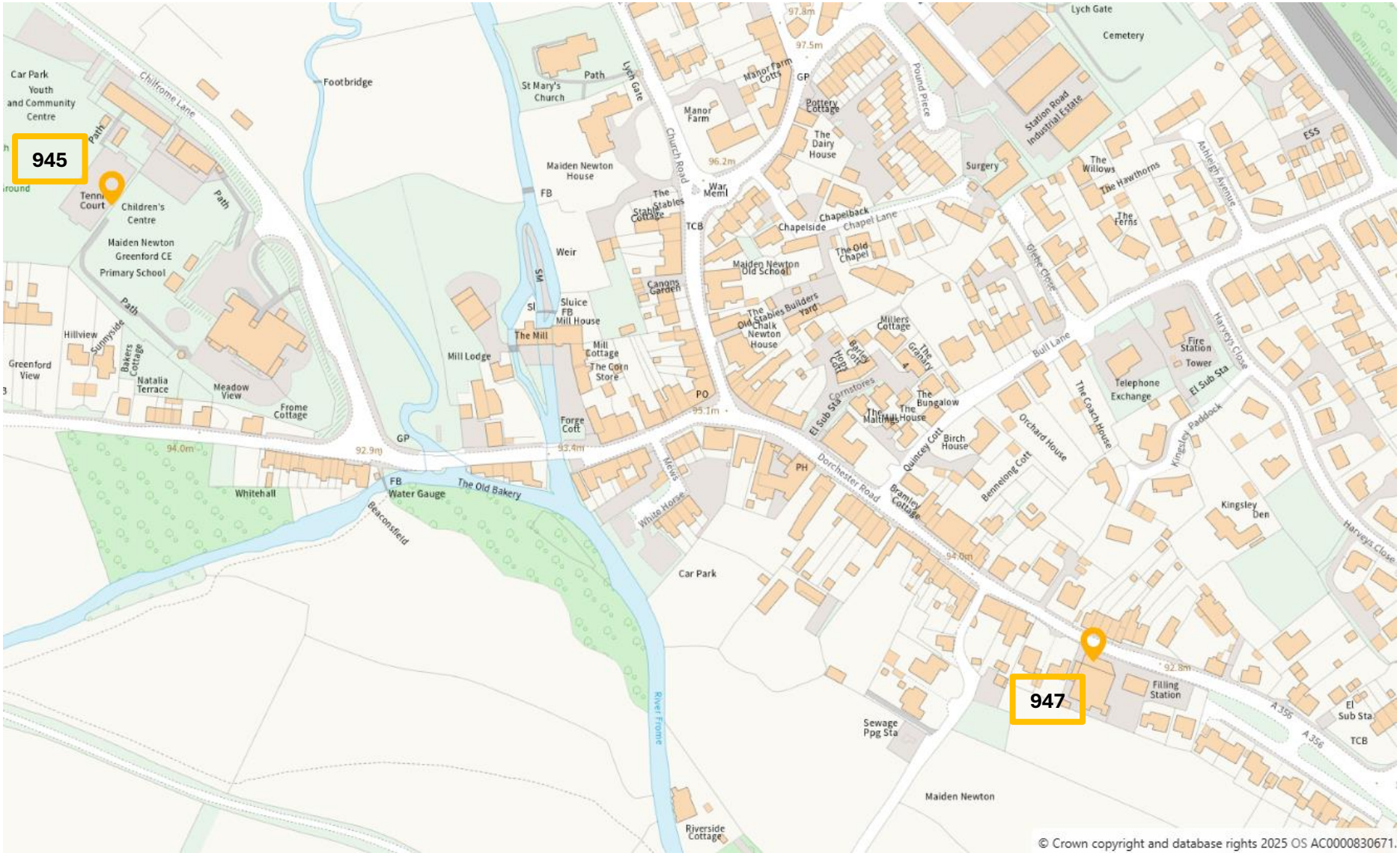
	No. stoves						
Cluster	Within 750m	Within 1500m	Other monitoring nearby	Background loc	Road loc	Possible major background source	Off gas network?
Lyme Regis	7	0	None	Roman Road	A3052	Seasalt	28-36%
				Langmoor Gardens/Seafront			51-58%
				The Cobb			
Bridport	7	5	East Road NOx tubes	Askers Meadow	A35	Seasalt	15-25%
				Lee Lane		Agriculture	25-35%
				Pymore Road			45-55%
Maiden Newton	4	0	None	Any away from road	A356	Agriculture	85-95%
Sherborne	6	0	None	Sherborne School Playing Fields	A30	Agriculture	25-35%
				Sherborne Castle			45-55%
Weymouth	4	1	NOx Tubes	Portland NOx Tube	A354	Seasalt	25-35%
			Boot Hill analyser	Radipole Park			45-55%
				Nothe Fort			75-85%
Shaftesbury	5	1	None	Wincombe Lane Playing Fields	A350	Agriculture	39-48%
				St Mary's School			
Swanage	6	1	Swanage NOx tubes	Durlston County Park	A351	Seasalt	37-48%
							74-83%
Corfe Mullen	7	2	None	Broadstone Golf Club	Wareham Road	Unknown	5-15%
Colehill	7	2	Wimborne NOx tubes	Cannon Hill	Canford Bottom	Agrigculture	5-15%
				Uddens Drive	A31		
				Bytheway Field			
West Moors	5	1	Ferndown AQMesh	White Moor	B3072	Unknown	5-15%
			Ferndown NOx tubes	Pennington's Copse			35-45%

AQ Mesh Locations

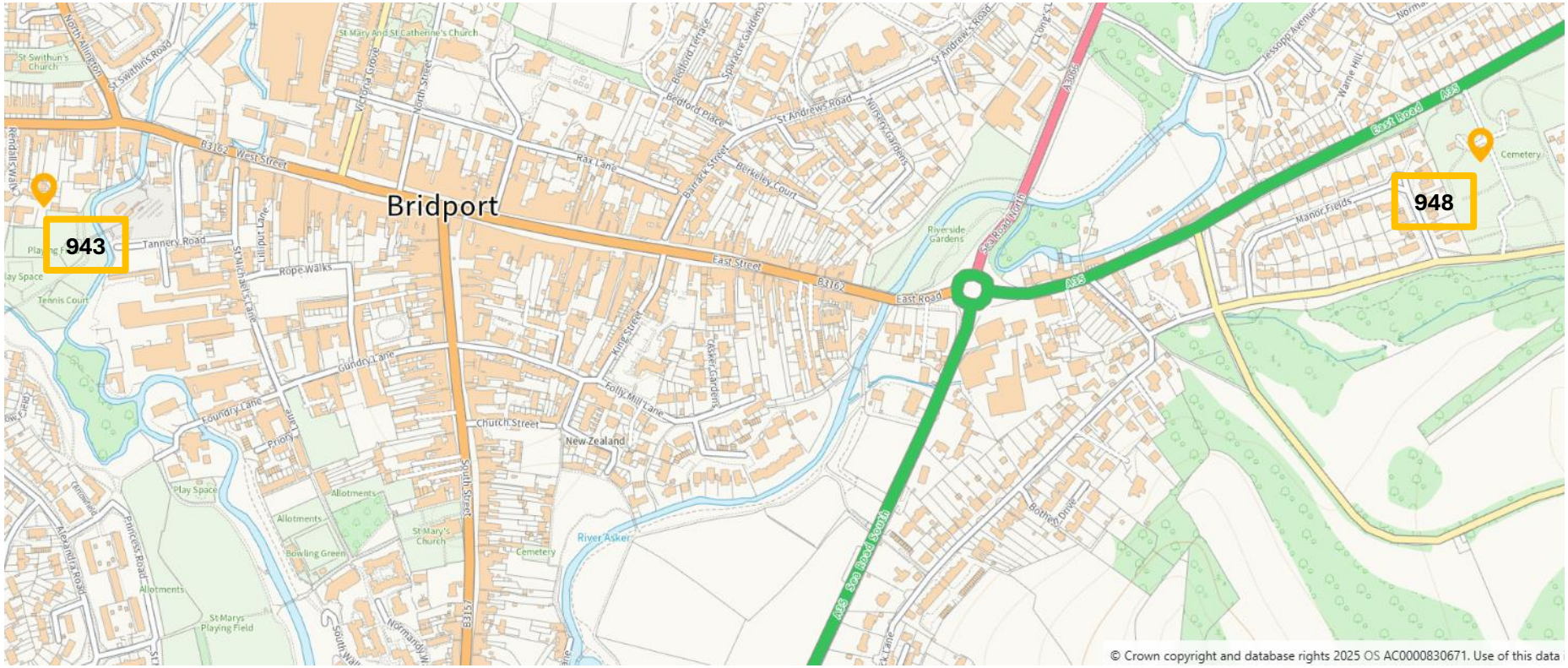
Swanage



Maiden Newton



Bridport


Bridport
943
948
B3162
West Street
East Street
East Road
Tannery Road
Rope Walks
Gundry Lane
Foundry Lane
Church Street
South Street
King Street
Folly Mill Lane
New Zealand
River Asker
Bowling Green
Allotments
Play Space
Cemetery
St Mary's Church
St Mary's Playing Field
Tennis Court
Riverside Gardens
Manor Fields
Bothen Drive
A35
A3066
Bedford Place
Barrack Street
Berkeley Court
St Andrew's Road
Rax Lane
Victoria Grove
North Street
Princess Road
Alexandra Road
B3157
Normandy Way
Cemetery
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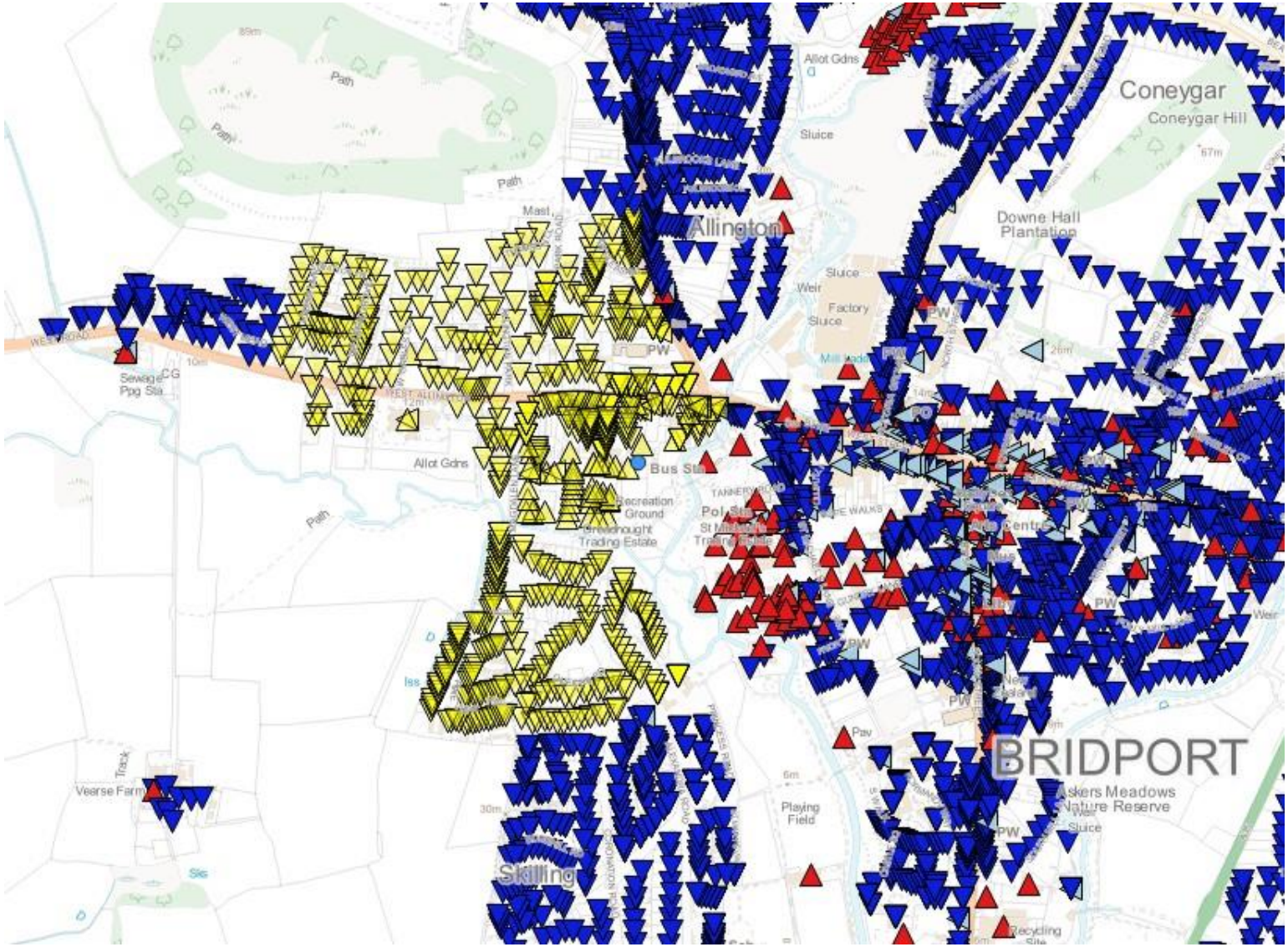
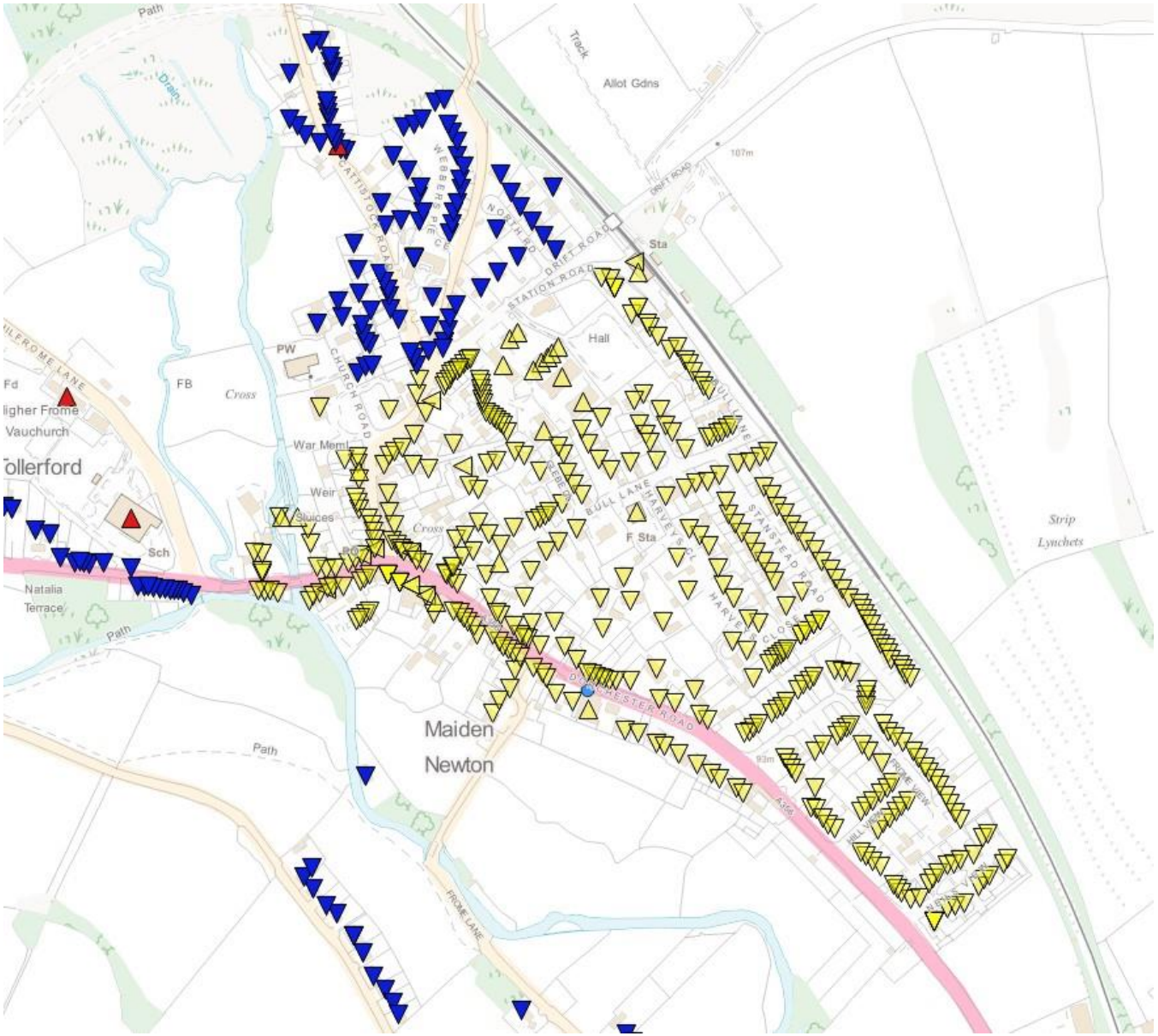
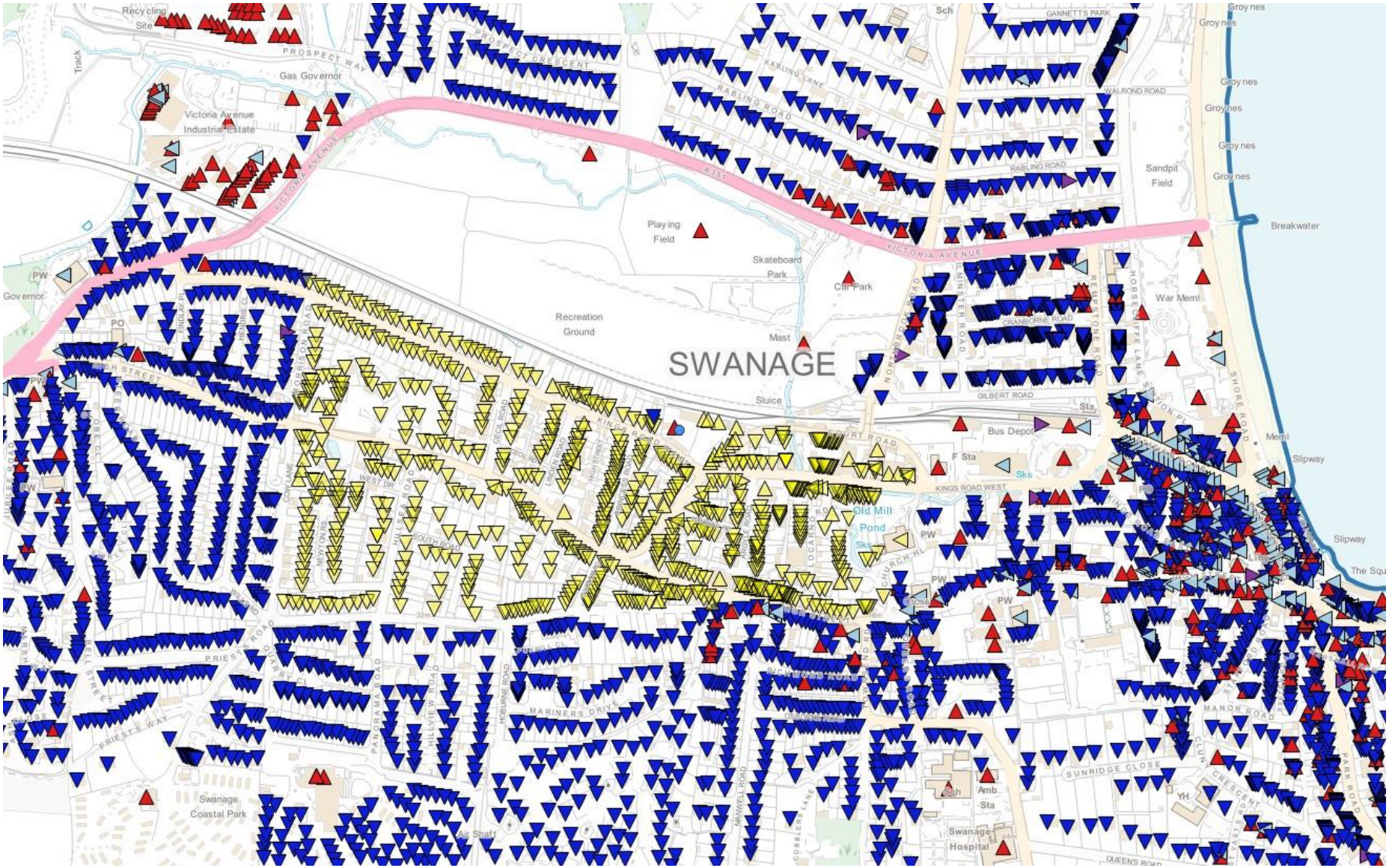
Polygons of Addresses (selected addresses shown in yellow)




Path
Drain
Track
Allot Gdns
107m
DRIFT ROAD
Sta
STATION ROAD
Hall
PW
CHURCH ROAD
FB
Cross
Fd
ligher Frome
Vauchurch
ollerford
War Mem
Weir
Sluices
Cross
F Sta
Sch
Natalia
Terrace
Path
Path
Maiden
Newton
Strip
Lynchets
STANSTEAD ROAD
GULL LANE
HARVEY CL
DORCHESTER ROAD
A356
93m
FROME LANE


SWANAGE
Recycling Site
Gas Governor
Victoria Avenue Industrial Estate
Playing Field
Skateboard Park
Car Park
Recreation Ground
Mast
Sluice
Sandpit Field
Breakwater
War Meml
Bus Depot
Old Mill Pond
Slipway
Swanage Coastal Park
Swanage Hospital
PRIESTS WAY
MARINERS DRIVE
KINGS ROAD WEST
GILBERT ROAD
VICTORIA AVENUE
RABLING ROAD
PROSPECT WAY
HIGH STREET
SUNRIDGE CLOSE
MANOR ROAD
QUEENS ROAD