# Bioaerosol Sampling Report

Bryn Lane IVC (Phase 1)

FCC Environment

3rd November 2023

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# Approval Sheet

| | |
|---|---|
| Customer: | FCC Environmental |
| Site: | Bryn Lane IVC,<br>Wrexham Recycling Park,<br>Bryn Lane, Wrexham<br>LL13 9UT |
| Project title: | Bioaerosols Sampling |
| Project Manager: | |
| Project Staff: | A. Hammersley BSc (Hons) FAOH<br>A.Lovell<br>S. Mullen<br>R.Chau |
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| Issue | Status | Date | Prepared By | Signature | Date |
|---|---|---|---|---|---|
| 1 | Final | 03/12/2023 | A. Balkwill-White |  | 03/12/2023 |
| | | | Approved By | Signature | Date |
| | | | A. Hammersley |  | 14/12/2023 |

# Foreword

Enitial has used its best endeavours, experience and expertise to provide a meaningful, accurate and relevant representation of the works carried out. The works were based on a defined programme and scope of works and terms and conditions agreed with the Client.

Enitial cannot accept responsibility to any parties whatsoever, following the issue of this report, for any matters arising which may be considered outside the agreed scope of works.

This report is issued solely to the Client. Enitial does not accept any responsibility to any third parties to whom this report may be circulated, in part or in full, and any such parties rely on the contents at their own risk.

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# 1.0 Scope of Work

Enitial was tasked with providing Bioaerosol monitoring for FCC Environment at Bryn Lane IVC (Phase 1) located within Wrexham Recycling Park, Bryn Lane, LL13 9UT.

Due to the potential health risks posed by the facility to nearby receptors, the testing was conducted to assess the amount of airborne bioaerosols being generated by the site that is released into the local environment. The monitoring is to ensure that this exposure is below the industry standard threshold set by the Environmental Agency.

Due to the complex layout and proximity of the site facility to other buildings an agreement has been made between the regulator NRM and FCC Environment Ltd. This is an amendment to the standards by the Environment Agency Technical Guidance Note (Monitoring) M9 to produce a modified site strategy.

FCC agree with NRW that the nearest sensitive receptor to the composting operation for sampling will be the Council Yard & Offices, which are approximately 70-80m from the emission stack.

The work was carried out on 3rd November 2023. This document is a presentation of the resulting data.

# 2.0 Background

The bioaerosol monitoring was specifically undertaken to enumerate the quantity of micro-organisms that can be cultured from representative samples of ambient air, collected at pre-determined monitoring points in the locality of the site.

The monitoring was undertaken in accordance with Environment Agency Technical Guidance Note (Monitoring) M9 – Environmental monitoring of bioaerosols at regulated facilities – July 2018.

Pre-prepared agar sample plates for *Aspergillus fumigatus,* mesophilic micro-organisms (bacteria) were directly impacted with ambient air using an Andersen sampler at the four selected sampling locations.

In the UK no statutory limits have been set for ambient concentrations of bioaerosols. However, as per the Environmental Agency Technical Guidance Note M17, guideline levels have been set for acceptable levels at sensitive receptors as the following:

- Total bacteria: 1000 cfu/$m^3$
- Aspergillus Fumigatus: 500 cfu/$m^3$
- Gram Negative Bacteria: 300 cfu/$m^3$

# 3.0 Methodology

## 3.1 Sampling Locations

Sample locations should be determined prior to the commencement of the sampling event where possible. The sampling locations have been set by NRW and FCC and were determined to achieve:

- Upwind sample location 001: One sampling location directly upwind of the centre of the IVC facility at the emissions stack.
- Downwind sample location 002: One location directly downwind of the IVC facility at the emissions stack.
- Sensitive Receptor sample location 003: One location at the nearest sensitive receptor, being the Council Yard and Offices.

The selection of appropriate locations should be made by consulting the site plan and in consultation with Enitial's account manager, the Client and/or Site/Facility Manager. Upwind sampling should be performed concurrently with downwind sampling. Locations can be adjusted if necessary if locations are unable to be used due to obstacles or health and safety issues as stated in the M9 document. Should a building, installation or structure intervene between the downwind site and the operational area, then sampling should be carried out upwind of that feature at a distance greater than twice its height.

## 3.2 Agar Plates

The types of Agar used were:

- *Mesophilic micro-organisms*: (Total Viable Count [TVC]) – Half Strength Nutrient Agar (also known as 93's – white in colour)
- *Aspergillus Fumigatus* / Total Fungi: (colony-forming unit [cfu]) – Malt Extract Agar (also known as 94's – light yellow in colour)
- *Gram Negative*: MacConkey (MAC) Agar + 0.2 g/L cyclohexamide (also known as VRBGA - pink in colour)

The impacted agar plates were subsequently delivered to a specialist laboratory within 24 hours via a cool box with ice packs where they were cultured and enumerated.

## 3.3 Equipment

### 3.31 List of Equipment

The equipment used is as follows:

- Continuous operation mobile weather station (wind speed, direction, temperature, humidity) and tripod
- Digital stopwatch
- GPS device
- 4 x single-stage Andersen samplers
- 4 x tripods
- 4 x hemicylindrical baffles
- 4 x stoppers for Andersen samplers
- 4 x fully charged vacuum pumps (individual capacity of at least 35l per min) and connecting tubing
- Rotameter to fit vacuum pump
- Agar plates – variety dependent on required test
- 2 x sealable airtight sterile plastic containers
- Cool box with ice packs for transport
- 70% v/v aqueous solution / wipes of ethanol or industrial methylated spirits cleaning solution or other suitable disinfectants

### 3.32 Cleaning of Equipment

All parts of the sampling equipment that were in contact with the samples, work surfaces or storage containers were cleaned with a 70% aqueous solution or wipes of ethanol or methylated spirits, or other suitable disinfectants prior to use. Equipment was completely dried, through air drying before the sampling exercise was commenced.

On completion of cleaning the Andersen single-stage samplers, a stopper was placed in the cone entrance to stop any contamination occurring before the sampling event.

### 3.33 Setup and Operation

- The pumps were Pre-run for a specified time at the required flow rate of 28.3l/min (±2%). This pump test was undertaken once before the start of the monitoring exercise.
- The Andersen single-stage samplers were mounted on to the tripods securely at a height of 1.5-1.8m above ground and the baffles were fitted on the tripod to form a rear shield when aligned to the desired sampling direction.
- The vacuum pump was connected to the rotameter using an appropriate length and diameter of the tubing. Using the rotameter, the flow rate was adjusted to ensure it is running at a constant flow of 28.3l/min (±2%) for each pump.
- On completion of the pump test, the tubing from the dry gas flow meters was disconnected from the rotameter then connected to the inlet on the corresponding Andersen single-stage sampler.
- Fresh sample plates were installed in turn by removing the lid and being placed within the Andersen single-stage sampler
- The stoppers in the inlet of the Andersen single-stage samplers were removed.
- When the Andersen single-stage samplers were fitted with plates the vacuum pumps were activated and the start time recorded on the stopwatch. All pumps were switched on/off at the same time or at a maximum interval of up to 10% of the total run time.
- When the sample duration was completed the pumps were stopped and the finish time recorded.
- The plates were carefully removed ensuring that no contact was made with the exposed agar surface,
- The dish cover was replaced on to the plate and secured with masking tape.
- Each plate was placed into an individual plastic bag and sealed.
- The plates were stored in an upright, protective and cooled container and transported to the laboratory within 24 hours.
- Control blank samples were taken at the site. The steps stated above were adhered to however the sample pump was not switched on. One of each sample media was inserted within the Andersen single-stage samplers, left in for the same period of sampling time, then packaged.
- Field blank samples were taken. The sample media were placed in re-sealable packaging without being opened.

The impacted agar plates were subsequently delivered to a specialist laboratory via a cool box with an ice pack. The analysis took place within 24 hours from sample collection

# 4.0 Presentation of Data

The following pages consist of meteorological conditions found on site, a presentation of the estimated concentrations of airborne micro-organisms, a plan displaying sample locations and the laboratory data.

## 4.1 Field Sampling Report

Site: Bryn Lane (Phase 1) IVC Facility

Site Operator: FCC Environmental

Date: 3rd November 2023

Start Time: 09:00
Finish Time: 11:15

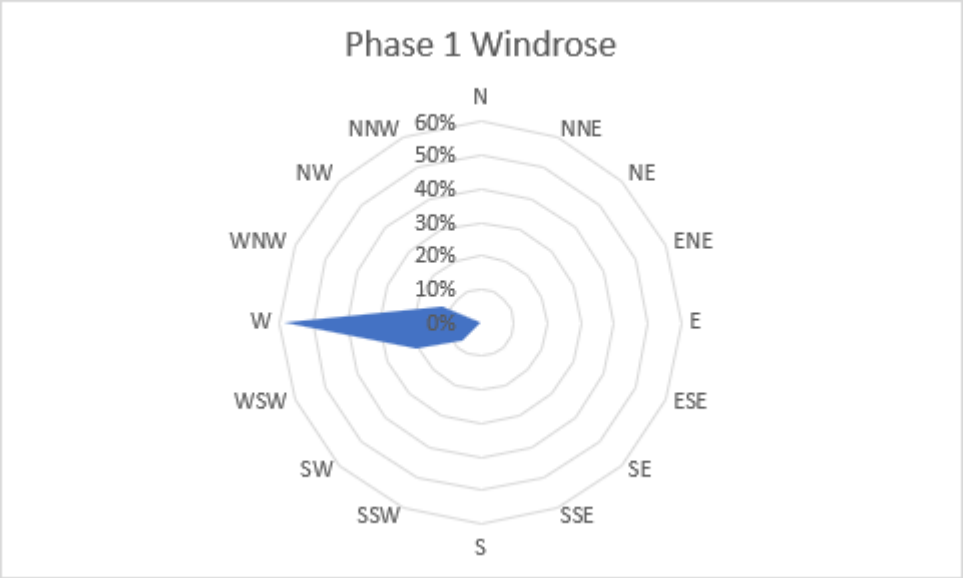
Monitoring Technician ID: A. Lovell, S.Mullen, R.Chau

## 4.11 Meteorological Conditions

*Table 1*: Weather Conditions

| Parameter | Wind Direction | Wind Speed (m/s) | Pressure (mb) | Temperature (°C) | Cloud Cover (0-8) |
|---|---|---|---|---|---|
| Start | W | 4.9 | 980 | 10 | 4 |
| Finish | WNW | 4.9 | 980 | 11 | 5 |

During the monitoring period winds were detected from the west, west-northwest, west-southwest, and southwest. Below is a wind rose demonstrating the wind directions recorded during the sampling period.




The Wind Rose shows the direction the wind blew from as a percentage of the total wind sampled. The full minute by minute recorded weather data from the site weather station is shown in Appendix B.

## 4.12 Site Description

FCC Bryn Lane (Phase 1) IVC facility is part of Wrexham Recycling Park in Wrexham Industrial Estate located on Bryn Lane, Wrexham in North Wales.

The Recycling Park also includes a Materials Recycling facility (MRF), (Phase 2) and a Household Waste Recycling Centre (HWRC) facility operated by FCC Environment. Wrexham Industrial Estate includes a nearby large food production facility and business park.

The IVC facility was fully operational during the sampling period and operating under normal conditions. The nearest sensitive receptor is the council yard and offices located Southwest of the IVC.

## 4.2 Field Sampling Comments

Samples were taken at an upwind, downwind location and at a sensitive receptor (council yard and offices) (see enclosed annotated image Appendix 'A') using Andersen samplers. Ambient air samples were collected by the technique of direct impaction, where a known quantity of air was directed onto an agar plate. The agar samples were then cultured and counted by a specialist laboratory. The count result provides a quantification of the potential health risks posed by the facility to nearby receptors.

*Table 2*: Sampling Locations

| Location | Description | Comments |
|---|---|---|
| Upwind location 001 | Gravel/grass area west of the IVC stack. | Standing water and tall grass nearby |
| Downwind location 002 | East of stack on grassy area | Stream close to location |
| Sensitive Receptor location 003 | Grass area behind the IVC | |

## 4.3 Deviations from Methods

*Table 3*: Deviations

| Location | Deviation | Reason |
|---|---|---|
| Upwind Location | Limited distance from the facility and sample location. | No access beyond site boundary and site infrastructure. |
| Downwind Location | Limited distance from the facility and sample location. | No access beyond site boundary and site infrastructure. |

The locations were assessed to take into account the effect of features and obstructions which may impact the effectiveness of the monitoring. The sampling locations were restricted to where safe physical access was possible along with being legally accessible. (see enclosed annotated image Appendix 'A'). Sampling locations were determined in agreement to the modified sampling strategy as agreed by the NRW regulator and FCC.

## 4.4 Field Sampling Record

*Table 4*: Field Sampling Results

| Ambient Sampling: Estimated concentration of bioaerosols | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Site: Bryn Lane IVC (Phase 1)<br>Sampling Date: 03/11/2023<br>Estimated Mass of Materials: Unknown<br>Activities affecting the concentration of Bioaerosols: IVC activities, biofilter stack | | | | | Site Operator: FCC Environment<br>Monitoring Contractor: Enitial<br>Type of Materials Processed on Site: Green Waste and Compost<br>Site Activity: Normal IVC operations | | | | | |
| Location and grid reference | Sample reference number | Distance from centre of active area (m) | Difference in bearing between location of samplers and mean direction wind blows to (°) | Sampling start/end times (HH:MM) | Concentration of bioaerosols (CFU/m$^3$) Total Count (TVC) | Concentration of bioaerosols (CFU/m$^3$) Aspergillus Fumigatus (YM) | Concentration of bioaerosols (CFU/m$^3$) Gram Negative Bacteria (GN) | Median of samples | | |
| | | | | | | | | TVC (CFU/m$^3$) | YM (CFU/m$^3$) | GN (CFU/m$^3$) |
| Upwind (1)<br>SJ 38595 49921 | UW001BIOAEM.<br>Upwind of IVC emissions stack | 106m | 164° | 10:24-10:29 | 336 | - | - | 49 | <7 | 28 |
| | | | | 10:24-10:29 | - | <7 | - | | | |
| | | | | 10:33-10:38 | - | - | <7 | | | |
| | | | | 10:33-10:38 | 49 | - | - | | | |
| | | | | 10:41-10:46 | - | <7 | - | | | |
| | | | | 10:41-10:46 | - | - | 56 | | | |
| | | | | 10:48-10:53 | 35 | - | - | | | |
| | | | | 10:48-10:53 | - | <7 | - | | | |
| | | | | 10:58-11:03 | - | - | 28 | | | |

| Location and grid reference | Sample reference number | Distance from centre of active area emission stack (m) | Difference in bearing between location of samplers and mean direction wind blows to (°) | Sampling start/end times (HH:MM) | Concentration of bioaerosols (CFU/$m^3$) Total Count (TVC) | Concentration of bioaerosols (CFU/$m^3$) Aspergillus Fumigatus (YM) | Concentration of bioaerosols (CFU/$m^3$) Gram Negative (GN) | Median of samples | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | TVC (CFU/$m^3$) | YM (CFU/$m^3$) | GN (CFU/$m^3$) |
| Downwind (2) SJ 38687 49921 | DW002BIOAEM. Downwind of IVC emissions stack | 31m | 108° | 10:24-10:29 | 63 | - | - | 77 | <7 | 35 |
| | | | | 10:24-10:29 | - | <7 | - | | | |
| | | | | 10:33-10:38 | - | - | <7 | | | |
| | | | | 10:33-10:38 | 126 | - | - | | | |
| | | | | 10:41-10:46 | - | <7 | - | | | |
| | | | | 10:41-10:46 | - | - | 56 | | | |
| | | | | 10:48-10:53 | 77 | - | - | | | |
| | | | | 10:48-10:53 | - | <7 | - | | | |
| | | | | 10:58-11:03 | - | - | 35 | | | |
| Receptor (3) SJ 38641 49891 | SR001BIOAEM. Receptor location on grassy area south of IVC near boundary to council offices | 82m | 133° | 10:24-10:29 | 140 | - | - | 56 | <7 | 28 |
| | | | | 10:24-10:29 | - | <7 | - | | | |
| | | | | 10:33-10:38 | - | - | 28 | | | |
| | | | | 10:33-10:38 | 56 | - | - | | | |
| | | | | 10:41-10:46 | - | <7 | - | | | |
| | | | | 10:41-10:46 | - | - | 21 | | | |
| | | | | 10:48-10:53 | 14 | - | - | | | |
| | | | | 10:48-10:53 | - | <7 | - | | | |
| | | | | 10:58-11:03 | - | - | 42 | | | |

| Location and grid reference | Sample reference number | Distance from centre of active area (m) | Difference in bearing between location of samplers and mean direction wind blows to (°) | Sampling start/end times (HH:MM) | Concentration of bioaerosols (CFU/m$^3$) Total Count (TVC) | Concentration of bioaerosols (CFU/m$^3$) Aspergillus Fumigatus (YM) | Concentration of bioaerosols ( CFU/m$^3$) Gram Negative (GN) | Median of samples | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | TVC (CFU/m$^3$) | YM (CFU/m$^3$) | GN (CFU/m$^3$) |
| Control | ControlBIOAEM At same location as Upwind | N/A | N/A | N/A | <1 | - | - | N/A | N/A | N/A |
| | | | | | - | <1 | - | | | |
| | | | | | - | - | <1 | | | |
| Field | FieldBIOAEM. Not removed from package. For QA/QC | N/A | N/A | N/A | <1 | - | - | N/A | N/A | N/A |
| | | | | | - | <1 | - | | | |
| | | | | | - | - | <1 | | | |

## 4.5 Process Contribution Results

The median is routinely used for statistics and probability theory as the results are less likely to be skewed by extremely high or low values that are not representative of the data set. The median is located by finding the middle value by evenly separating the data set. The median for each location has been calculated and then the highest result for the downwind locations identified. The process contribution has then been calculated by subtracting the upwind median value from the highest downwind median value. The process contribution shows the input the activity of the site has on the ambient bioaerosols concentrations. In the table below the process contribution is shown.

*Table 5*: Process Contribution Results

| Process Contribution Results | | | | |
|---|---|---|---|---|
| Sample type | Upwind median results | Downwind median highest results | Process Contribution | Sensitive Receptor |
| Total Bacteria viable Count (TVC) | 49 | 77 | **28** | 56 |
| Aspergillus fumigatus (YM) | <7 | <7 | **0** | <7 |
| Gram Negative Bacteria (GN) | 28 | 35 | **7** | 28 |

# 5.0 Summary of Analytical Results

The above reports indicate that at the time of sampling:

1. Mesophilic micro-organisms - Total Viable Count (TVC) shows higher readings at the downwind location compared to the upwind location.

2. Aspergillus fumigatus readings were not detected at upwind, downwind or sensitive receptor sample locations.

3. Gram Negative bacteria readings were detected at upwind, downwind and sensitive receptor locations.

4. Upwind location median results remained below the industry standard threshold values of 1000cfu/$m^3$ for Total Bacteria.

5. Downwind location median process contribution results of **28cfu/$m^3$** remained below the industry standard threshold values of 1000cfu/$m^3$ for Total Bacteria.

6. Sensitive receptor location median results remained below the industry standard threshold values of 1000cfu/$m^3$ for Total Bacteria.

7. Upwind location median results remained below the industry standard threshold values of 300cfu/$m^3$ for Gram Negative bacteria.

8. Downwind location median process contribution results of **7cfu/$m^3$** remained below the industry standard threshold values of 300cfu/$m^3$ for Gram Negative bacteria

9. Sensitive receptor location median results remained below the industry standard threshold values of 300cfu/$m^3$ for Gram Negative bacteria

10. Upwind location median results remained below the industry standard threshold values of 500cfu/$m^3$ for Aspergillus Fumigatus.

11. Downwind location median process contribution results of **0cfu/$m^3$** remained below the industry standard threshold values of 500cfu/$m^3$ for Aspergillus Fumigatus.

12. Sensitive receptor location median results remained below the industry standard threshold values of 500cfu/$m^3$ for Aspergillus Fumigatus.

13. Control and Field blanks for QA/QC showed no significant evidence of contamination.

APPENDIX A

Aerial Plan

**Key**

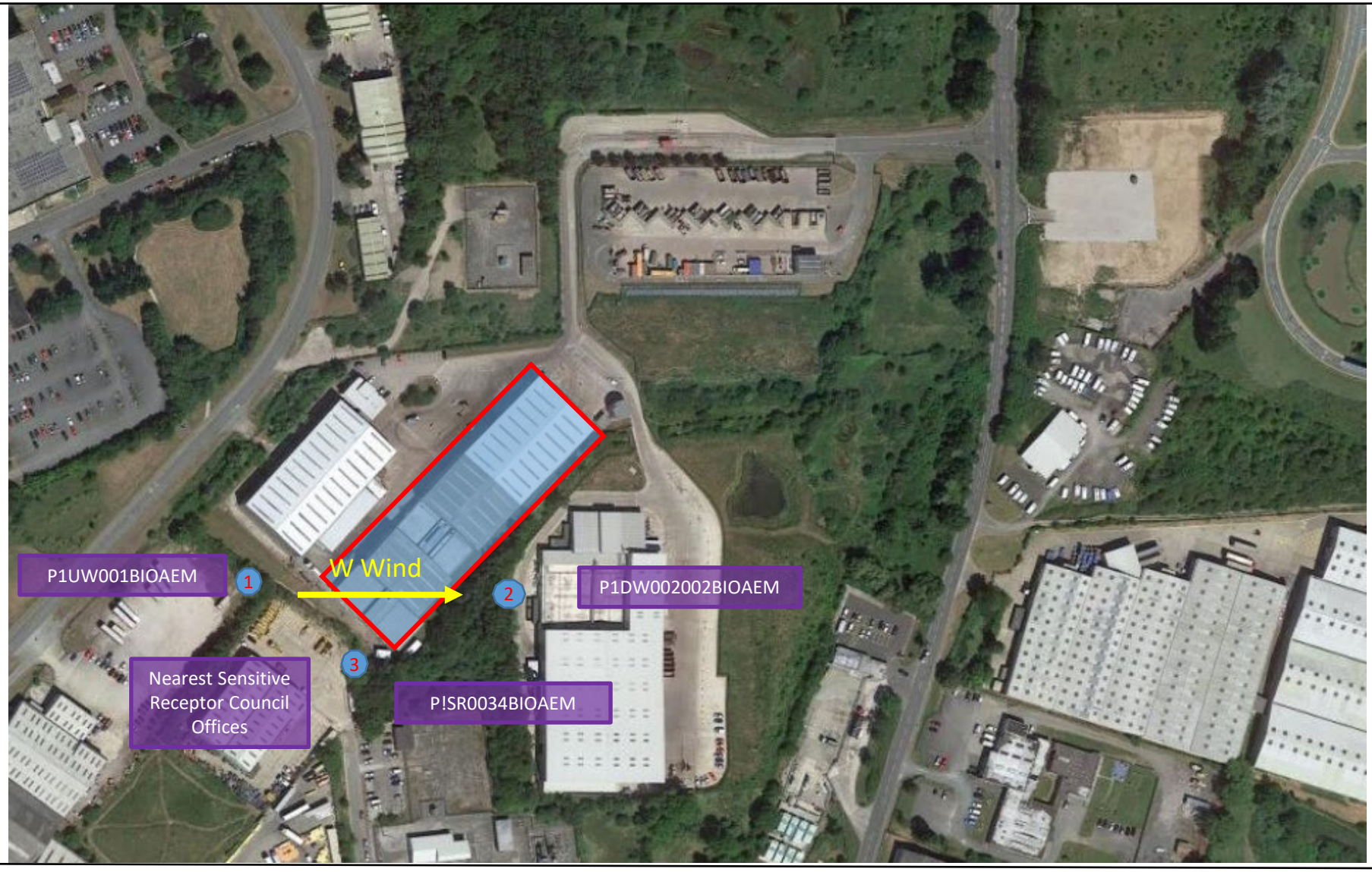
**1** – Upwind

**2** – Downwind

**3** – Sensitive Receptor

**Blue area** – Emission source

**Red Box** – Site area




FCC – Bryn Lane Phase 1 IVC 03/11/2023
Aerial Plan Showing Bioaerosol Sample Locations

Enitial part of Cawood

# APPENDIX B
# Meteorological Conditions

## METEOROLOGICAL CONDITIONS

| | | | |
|---|---|---|---|
| SITE: | Bryn Lane IVC (Phase 1) | SITE OPERATOR: | FCC Environmental |
| SAMPLING DATE: | 03/11/2023 | COMMISSIONING LABORATORY: | Southern Microbiological Services |
| ESTIMATED MASS OF MATERIALS: | Unknown | TYPE OF MATERIALS PROCESSED ON SITE: | Green waste and compost |

| Location | Sample Reference Number | Bearing of samplers from boundary of operational area or turning/ screening operation (° from true north) - GPS | Mean direction the wind blows to during the sampling period (° from true north) | Difference in bearing between location of samples from boundary/ source and mean direction wind blows to (°) | Mean wind speed during sampling (m/s) | Arithmetic mean of air temperature (°C) | Arithmetic mean of relative humidity (%) |
|---|---|---|---|---|---|---|---|
| Upwind | UW001BIOAEM | 254<br>SJ 38595 49921 | 90 | 164 | 4.9 | 10.5 | 79 |
| Downwind | DW002BIOAEM | 198<br>SJ 38687 49921 | 90 | 108 | 4.9 | 10.5 | 79 |
| Sensitive Receptor | SR001BIOAEM | 223<br>SJ 38641 49891 | 90 | 133 | 4.9 | 10.5 | 79 |

Raw Weather Station Data for Bryn Lane IVC Phase 1

| Units: Ter | Wind mph | | Rain mm | Pressure mb | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| stationid | datestamp | | metardat | wspeed | w10min | wdir | wsectr | tout | tdew | tin | hin | hour | rmonth | ryear | pressure | clouds1 | uv | wgust | wgustd | wns | touthi | toutlo | uvm | etd | etmc | ety |
| WRBS | 03/11/2023 | 10:00 | 31000 | 8.95 | 2.91 | 248 | WSW | 10.3 | 6.61 | 21 | 50 | 78 | 13.8 | 537.2 | 979.11 | CAL:016 | 0 | 8.95 | 248 | 23 | 10.3 | 10.3 | 0 | 0 | 0 | 0 |
| WRBS | 03/11/2023 | 10:01 | 31001 | 10.07 | 8.05 | 270 | W | 10.3 | 6.61 | 21 | 50 | 78 | 13.8 | 537.2 | 979.11 | CAL:016 | 0 | 10.07 | 248 | 22 | 10.3 | 10.3 | 0 | 0 | 0 | 0 |
| WRBS | 03/11/2023 | 10:02 | 31002 | 6.04 | 4.03 | 270 | W | 10.3 | 6.43 | 21 | 50 | 77 | 13.8 | 537.2 | 979.11 | CAL:017 | 0 | 6.04 | 270 | 20 | 10.3 | 10.3 | 0 | 0 | 0 | 0 |
| WRBS | 03/11/2023 | 10:03 | 31003 | 6.93 | 4.92 | 225 | SW | 10.3 | 6.43 | 21 | 50 | 77 | 13.8 | 537.2 | 979.11 | CAL:017 | 0 | 6.93 | 293 | 21 | 10.3 | 10.3 | 0 | 0 | 0 | 0 |
| WRBS | 03/11/2023 | 10:04 | 31004 | 10.07 | 6.04 | 270 | W | 10.4 | 6.52 | 21 | 50 | 77 | 13.8 | 537.2 | 979.11 | CAL:017 | 0 | 10.07 | 248 | 23 | 10.4 | 10.3 | 0 | 0 | 0 | 0 |
| WRBS | 03/11/2023 | 10:05 | 31005 | 8.95 | 6.93 | 248 | WSW | 10.4 | 6.52 | 21 | 50 | 77 | 13.8 | 537.2 | 979.11 | CAL:017 | 0 | 8.95 | 270 | 24 | 10.4 | 10.4 | 0 | 0 | 0 | 0 |
| WRBS | 03/11/2023 | 10:06 | 31006 | 6.93 | 4.03 | 270 | W | 10.4 | 6.52 | 21 | 50 | 77 | 13.8 | 537.2 | 979.11 | CAL:017 | 0 | 6.93 | 225 | 22 | 10.4 | 10.4 | 0 | 0 | 0 | 0 |
| WRBS | 03/11/2023 | 10:07 | 31007 | 6.93 | 4.92 | 270 | W | 10.4 | 6.71 | 21 | 50 | 78 | 13.8 | 537.2 | 979.11 | CAL:016 | 0 | 6.93 | 248 | 23 | 10.4 | 10.4 | 0 | 0 | 0 | 0 |
| WRBS | 03/11/2023 | 10:08 | 31008 | 4.92 | 2.91 | 225 | SW | 10.5 | 6.81 | 21 | 50 | 78 | 13.8 | 537.2 | 979.11 | CAL:016 | 0 | 4.92 | 225 | 22 | 10.5 | 10.4 | 0 | 0 | 0 | 0 |
| WRBS | 03/11/2023 | 10:09 | 31009 | 6.93 | 2.91 | 225 | SW | 10.5 | 6.81 | 21 | 50 | 78 | 13.8 | 537.2 | 979.2 | CAL:016 | 0 | 6.93 | 225 | 23 | 10.5 | 10.5 | 0 | 0 | 0 | 0 |
| WRBS | 03/11/2023 | 10:10 | 31010 | 10.96 | 6.04 | 248 | WSW | 10.6 | 6.9 | 21 | 50 | 78 | 13.8 | 537.2 | 979.2 | CAL:016 | 0 | 10.96 | 270 | 23 | 10.6 | 10.5 | 0 | 0 | 0 | 0 |
| WRBS | 03/11/2023 | 10:11 | 31011 | 8.05 | 6.04 | 270 | W | 10.6 | 6.9 | 21 | 50 | 78 | 13.8 | 537.2 | 979.2 | CAL:016 | 0 | 8.05 | 248 | 21 | 10.6 | 10.6 | 0 | 0 | 0 | 0 |
| WRBS | 03/11/2023 | 10:12 | 31012 | 6.93 | 4.03 | 225 | SW | 10.6 | 6.9 | 21 | 50 | 78 | 13.8 | 537.2 | 979.2 | CAL:016 | 0 | 6.93 | 293 | 19 | 10.6 | 10.6 | 0 | 0 | 0 | 0 |
| WRBS | 03/11/2023 | 10:13 | 31013 | 8.05 | 2.01 | 270 | W | 10.7 | 7 | 21 | 50 | 78 | 13.8 | 537.2 | 979.2 | CAL:016 | 0 | 8.05 | 270 | 22 | 10.7 | 10.6 | 0 | 0 | 0 | 0 |
| WRBS | 03/11/2023 | 10:14 | 31014 | 8.95 | 6.04 | 248 | WSW | 10.7 | 6.81 | 21.1 | 50 | 77 | 13.8 | 537.2 | 979.31 | CAL:017 | 0 | 8.95 | 293 | 22 | 10.7 | 10.7 | 0 | 0 | 0 | 0 |
| WRBS | 03/11/2023 | 10:15 | 31015 | 10.07 | 4.92 | 225 | SW | 10.7 | 6.81 | 21.1 | 49 | 77 | 13.8 | 537.2 | 979.2 | CAL:017 | 0 | 10.07 | 315 | 23 | 10.7 | 10.7 | 0 | 0 | 0 | 0 |
| WRBS | 03/11/2023 | 10:16 | 31016 | 12.97 | 10.96 | 293 | WNW | 10.7 | 6.81 | 21.1 | 49 | 77 | 13.8 | 537.2 | 979.31 | CAL:017 | 0 | 12.97 | 293 | 23 | 10.7 | 10.7 | 0 | 0 | 0 | 0 |
| WRBS | 03/11/2023 | 10:17 | 31017 | 10.07 | 6.93 | 293 | WNW | 10.8 | 6.91 | 21.1 | 49 | 77 | 13.8 | 537.2 | 979.31 | CAL:017 | 0 | 10.07 | 293 | 23 | 10.8 | 10.8 | 0 | 0 | 0 | 0 |
| WRBS | 03/11/2023 | 10:18 | 31018 | 4.92 | 4.03 | 270 | W | 10.8 | 6.91 | 21.1 | 49 | 77 | 13.8 | 537.2 | 979.31 | CAL:017 | 0 | 4.92 | 270 | 23 | 10.8 | 10.8 | 0 | 0 | 0 | 0 |
| WRBS | 03/11/2023 | 10:19 | 31019 | 8.05 | 4.03 | 248 | WSW | 10.9 | 7.01 | 21.1 | 49 | 77 | 13.8 | 537.2 | 979.4 | CAL:017 | 0 | 8.05 | 248 | 23 | 10.9 | 10.8 | 0 | 0 | 0 | 0 |
| WRBS | 03/11/2023 | 10:20 | 31020 | 12.08 | 6.93 | 248 | WSW | 10.9 | 7.01 | 21.1 | 49 | 77 | 13.8 | 537.2 | 979.31 | CAL:017 | 0 | 12.08 | 248 | 23 | 10.9 | 10.9 | 0 | 0 | 0 | 0 |
| WRBS | 03/11/2023 | 10:21 | 31021 | 10.07 | 8.05 | 248 | WSW | 10.9 | 7.01 | 21.1 | 49 | 77 | 13.8 | 537.2 | 979.31 | CAL:017 | 0 | 10.07 | 248 | 21 | 10.9 | 10.9 | 0 | 0 | 0 | 0 |
| WRBS | 03/11/2023 | 10:22 | 31022 | 8.95 | 6.04 | 270 | W | 11 | 7.1 | 21.1 | 49 | 77 | 13.8 | 537.2 | 979.31 | CAL:017 | 0 | 8.95 | 270 | 19 | 11 | 11 | 0 | 0 | 0 | 0 |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| WRBS | 03/11/2023 10:23 | 31023 | 8.05 | 4.03 | 293 | WNW | 11.1 | 7.2 | 21.2 | 49 | 77 | 13.8 | 537.2 | 979.31 | CAL:017 | 0.6 | 8.05 | 248 | 22 | 11.1 | 11 | 1 | 0 | 0 | 0 |
| WRBS | 03/11/2023 10:24 | 31024 | 10.07 | 6.93 | 270 | W | 11.1 | 7.2 | 21.2 | 49 | 77 | 13.8 | 537.2 | 979.4 | CAL:017 | 0.5 | 10.07 | 225 | 24 | 11.1 | 11.1 | 1 | 0 | 0.1 | 0 |
| WRBS | 03/11/2023 10:25 | 31025 | 10.96 | 8.95 | 270 | W | 11.1 | 7.2 | 21.2 | 49 | 77 | 13.8 | 537.2 | 979.4 | CAL:017 | 0.5 | 10.96 | 270 | 22 | 11.1 | 11.1 | 1 | 0 | 0.1 | 0 |
| WRBS | 03/11/2023 10:26 | 31026 | 8.95 | 6.93 | 293 | WNW | 11.1 | 7.01 | 21.2 | 49 | 76 | 13.8 | 537.2 | 979.4 | CAL:018 | 0 | 8.95 | 293 | 23 | 11.1 | 11.1 | 0 | 0 | 0 | 0 |
| WRBS | 03/11/2023 10:27 | 31027 | 6.04 | 4.92 | 270 | W | 11.2 | 7.11 | 21.2 | 49 | 76 | 13.8 | 537.2 | 979.4 | CAL:018 | 0.6 | 6.04 | 293 | 23 | 11.2 | 11.1 | 1 | 0 | 0 | 0 |
| WRBS | 03/11/2023 10:28 | 31028 | 6.93 | 4.92 | 270 | W | 11.2 | 7.11 | 21.2 | 49 | 76 | 13.8 | 537.2 | 979.4 | CAL:018 | 0.7 | 6.93 | 270 | 21 | 11.2 | 11.2 | 1 | 0 | 0.1 | 0 |
| WRBS | 03/11/2023 10:29 | 31029 | 8.05 | 4.92 | 248 | WSW | 11.2 | 7.3 | 21.2 | 49 | 77 | 13.8 | 537.2 | 979.4 | CAL:017 | 0.6 | 8.05 | 248 | 24 | 11.2 | 11.2 | 1 | 0 | 0.1 | 0 |
| WRBS | 03/11/2023 10:30 | 31030 | 8.05 | 4.92 | 248 | WSW | 11.2 | 7.3 | 21.2 | 49 | 77 | 13.8 | 537.2 | 979.4 | CAL:017 | 0.6 | 8.05 | 248 | 21 | 11.2 | 11.2 | 1 | 0 | 0.2 | 0 |
| WRBS | 03/11/2023 10:31 | 31031 | 10.07 | 6.93 | 248 | WSW | 11.2 | 7.3 | 21.2 | 49 | 77 | 13.8 | 537.2 | 979.51 | CAL:017 | 0.6 | 10.07 | 248 | 18 | 11.2 | 11.2 | 1 | 0 | 0.2 | 0 |
| WRBS | 03/11/2023 10:32 | 31032 | 8.05 | 4.03 | 225 | SW | 11.2 | 7.3 | 21.2 | 49 | 77 | 13.8 | 537.2 | 979.51 | CAL:017 | 0.7 | 8.05 | 270 | 23 | 11.2 | 11.2 | 1 | 0 | 0.2 | 0 |
| WRBS | 03/11/2023 10:33 | 31033 | 8.95 | 6.04 | 248 | WSW | 11.2 | 7.3 | 21.3 | 49 | 77 | 13.8 | 537.2 | 979.51 | CAL:017 | 0.7 | 8.95 | 248 | 22 | 11.2 | 11.2 | 1 | 0 | 0.3 | 0 |
| WRBS | 03/11/2023 10:34 | 31034 | 4.92 | 4.03 | 270 | W | 11.3 | 7.39 | 21.3 | 49 | 77 | 13.8 | 537.2 | 979.51 | CAL:017 | 0.7 | 4.92 | 248 | 24 | 11.3 | 11.2 | 1 | 0 | 0.3 | 0 |
| WRBS | 03/11/2023 10:35 | 31035 | 8.05 | 6.04 | 293 | WNW | 11.3 | 7.39 | 21.3 | 49 | 77 | 13.8 | 537.2 | 979.51 | CAL:017 | 0.7 | 8.05 | 293 | 22 | 11.3 | 11.3 | 1 | 0 | 0.4 | 0 |
| WRBS | 03/11/2023 10:36 | 31036 | 8.95 | 6.93 | 293 | WNW | 11.3 | 7.39 | 21.3 | 49 | 77 | 13.8 | 537.2 | 979.4 | CAL:017 | 0.7 | 8.95 | 293 | 24 | 11.3 | 11.3 | 1 | 0 | 0.4 | 0 |
| WRBS | 03/11/2023 10:37 | 31037 | 8.95 | 6.93 | 270 | W | 11.3 | 7.39 | 21.3 | 49 | 77 | 13.8 | 537.2 | 979.51 | CAL:017 | 0.7 | 8.95 | 270 | 22 | 11.3 | 11.3 | 1 | 0 | 0.4 | 0 |
| WRBS | 03/11/2023 10:38 | 31038 | 10.07 | 8.05 | 270 | W | 11.3 | 7.39 | 21.3 | 49 | 77 | 13.8 | 537.2 | 979.4 | CAL:017 | 0.7 | 10.07 | 225 | 23 | 11.3 | 11.3 | 1 | 0 | 0.5 | 0 |
| WRBS | 03/11/2023 10:39 | 31039 | 16.11 | 8.95 | 270 | W | 11.3 | 7.39 | 21.4 | 49 | 77 | 13.8 | 537.2 | 979.51 | CAL:017 | 0.7 | 16.11 | 248 | 23 | 11.3 | 11.3 | 1 | 1 | 0.5 | 1 |
| WRBS | 03/11/2023 10:40 | 31040 | 16.11 | 10.07 | 270 | W | 11.3 | 7.39 | 21.4 | 49 | 77 | 13.8 | 537.2 | 979.4 | CAL:017 | 0.6 | 16.11 | 248 | 23 | 11.3 | 11.3 | 1 | 1 | 0.6 | 1 |
| WRBS | 03/11/2023 10:41 | 31041 | 14.99 | 8.95 | 293 | WNW | 11.3 | 7.2 | 21.4 | 49 | 76 | 13.8 | 537.2 | 979.4 | CAL:018 | 0.8 | 14.99 | 270 | 19 | 11.3 | 11.3 | 1 | 1 | 0.6 | 1 |
| WRBS | 03/11/2023 10:42 | 31042 | 10.96 | 6.93 | 270 | W | 11.3 | 7.39 | 21.4 | 49 | 77 | 13.8 | 537.2 | 979.4 | CAL:017 | 0.7 | 10.96 | 270 | 23 | 11.3 | 11.3 | 1 | 1 | 0.6 | 1 |
| WRBS | 03/11/2023 10:43 | 31043 | 8.95 | 6.04 | 270 | W | 11.3 | 7.39 | 21.5 | 49 | 77 | 13.8 | 537.2 | 979.4 | CAL:017 | 0.6 | 8.95 | 293 | 24 | 11.3 | 11.2 | 1 | 1 | 0.7 | 1 |
| WRBS | 03/11/2023 10:44 | 31044 | 14.99 | 8.95 | 270 | W | 11.3 | 7.39 | 21.5 | 49 | 77 | 13.8 | 537.2 | 979.4 | CAL:017 | 0.7 | 14.99 | 248 | 23 | 11.3 | 11.2 | 1 | 1 | 0.7 | 1 |
| WRBS | 03/11/2023 10:45 | 31045 | 12.97 | 10.96 | 270 | W | 11.3 | 7.39 | 21.5 | 49 | 77 | 13.8 | 537.2 | 979.4 | CAL:017 | 0.7 | 12.97 | 270 | 23 | 11.3 | 11.3 | 1 | 1 | 0.8 | 1 |
| WRBS | 03/11/2023 10:46 | 31046 | 10.96 | 8.95 | 248 | WSW | 11.2 | 7.3 | 21.5 | 49 | 77 | 13.8 | 537.2 | 979.4 | CAL:017 | 0.5 | 10.96 | 270 | 24 | 11.3 | 11.2 | 1 | 1 | 0.8 | 1 |
| WRBS | 03/11/2023 10:47 | 31047 | 12.97 | 8.05 | 270 | W | 11.2 | 7.3 | 21.5 | 49 | 77 | 13.8 | 537.2 | 979.4 | CAL:017 | 0.6 | 12.97 | 270 | 23 | 11.2 | 11.2 | 1 | 1 | 0.8 | 1 |
| WRBS | 03/11/2023 10:48 | 31048 | 16.11 | 10.07 | 248 | WSW | 11.2 | 7.3 | 21.5 | 49 | 77 | 13.8 | 537.2 | 979.31 | CAL:017 | 0.5 | 16.11 | 248 | 24 | 11.2 | 11.2 | 1 | 1 | 0.8 | 1 |
| WRBS | 03/11/2023 10:49 | 31049 | 14.09 | 10.07 | 270 | W | 11.2 | 7.3 | 21.5 | 49 | 77 | 13.8 | 537.2 | 979.4 | CAL:017 | 0.5 | 14.09 | 270 | 23 | 11.2 | 11.2 | 1 | 1 | 0.9 | 1 |
| WRBS | 03/11/2023 10:50 | 31050 | 14.99 | 10.96 | 270 | W | 11.2 | 7.3 | 21.5 | 49 | 77 | 13.8 | 537.2 | 979.31 | CAL:017 | 0.5 | 14.99 | 270 | 20 | 11.2 | 11.2 | 1 | 1 | 0.9 | 1 |
| WRBS | 03/11/2023 10:51 | 31051 | 10.96 | 8.05 | 293 | WNW | 11.2 | 7.3 | 21.5 | 49 | 77 | 13.8 | 537.2 | 979.31 | CAL:017 | 0.5 | 10.96 | 270 | 23 | 11.2 | 11.2 | 1 | 1 | 0.9 | 1 |
| WRBS | 03/11/2023 10:52 | 31052 | 10.96 | 8.95 | 270 | W | 11.1 | 7.2 | 21.6 | 49 | 77 | 13.8 | 537.2 | 979.31 | CAL:017 | 0.6 | 10.96 | 270 | 22 | 11.2 | 11.1 | 1 | 1 | 0.9 | 1 |
| WRBS | 03/11/2023 10:53 | 31053 | 10.96 | 8.95 | 270 | W | 11.1 | 7.2 | 21.6 | 49 | 77 | 13.8 | 537.2 | 979.31 | CAL:017 | 0.6 | 10.96 | 270 | 24 | 11.1 | 11.1 | 1 | 1 | 1 | 1 |
| WRBS | 03/11/2023 10:54 | 31054 | 14.99 | 10.96 | 270 | W | 11.1 | 7.39 | 21.6 | 49 | 78 | 13.8 | 537.2 | 979.31 | CAL:016 | 0.5 | 14.99 | 270 | 23 | 11.1 | 11.1 | 1 | 1 | 1 | 1 |
| WRBS | 03/11/2023 10:55 | 31055 | 14.99 | 10.96 | 270 | W | 11.1 | 7.39 | 21.6 | 49 | 78 | 13.8 | 537.2 | 979.31 | CAL:016 | 0.5 | 14.99 | 248 | 24 | 11.1 | 11.1 | 1 | 1 | 1 | 1 |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| WRBS | 03/11/2023 10:56 | 31056 | 14.09 | 10.07 | 270 | W | 11 | 7.29 | 21.6 | 49 | 78 | 13.8 | 537.2 | 979.31 | CAL:016 | 0.5 | 14.09 | 270 | 23 | 11.1 | 11 | 1 | 1 | 1 | 1 |
| WRBS | 03/11/2023 10:57 | 31057 | 10.96 | 8.05 | 270 | W | 11 | 7.29 | 21.6 | 49 | 78 | 13.8 | 537.2 | 979.31 | CAL:016 | 0.5 | 10.96 | 270 | 22 | 11 | 11 | 1 | 1 | 1.1 | 1 |
| WRBS | 03/11/2023 10:58 | 31058 | 12.97 | 8.95 | 270 | W | 10.9 | 7.2 | 21.6 | 49 | 78 | 13.8 | 537.2 | 979.31 | CAL:016 | 0.6 | 12.97 | 270 | 24 | 11 | 10.9 | 1 | 1 | 1.1 | 1 |
| WRBS | 03/11/2023 10:59 | 31059 | 10.07 | 8.05 | 270 | W | 10.9 | 7.2 | 21.6 | 49 | 78 | 13.8 | 537.2 | 979.31 | CAL:016 | 0.5 | 10.07 | 248 | 23 | 11 | 10.9 | 1 | 1 | 1.1 | 1 |
| WRBS | 03/11/2023 11:00 | 31100 | 14.09 | 10.07 | 270 | W | 10.9 | 7.2 | 21.6 | 49 | 78 | 13.8 | 537.2 | 979.31 | CAL:016 | 0.5 | 14.09 | 293 | 19 | 10.9 | 10.9 | 1 | 1 | 1.1 | 1 |
| WRBS | 03/11/2023 11:01 | 31101 | 12.08 | 8.95 | 270 | W | 10.9 | 7.38 | 21.6 | 49 | 79 | 13.8 | 537.2 | 979.31 | CAL:016 | 0.5 | 12.08 | 270 | 23 | 10.9 | 10.9 | 1 | 1 | 1.2 | 1 |
| WRBS | 03/11/2023 11:02 | 31102 | 14.09 | 8.95 | 248 | WSW | 10.9 | 7.38 | 21.6 | 49 | 79 | 13.8 | 537.2 | 979.31 | CAL:016 | 0.5 | 14.09 | 248 | 23 | 10.9 | 10.9 | 1 | 1 | 1.2 | 1 |
| WRBS | 03/11/2023 11:03 | 31103 | 14.09 | 10.07 | 248 | WSW | 10.9 | 7.38 | 21.6 | 49 | 79 | 13.8 | 537.2 | 979.4 | CAL:016 | 0.5 | 14.09 | 225 | 23 | 10.9 | 10.9 | 1 | 1 | 1.2 | 1 |
| WRBS | 03/11/2023 11:04 | 31104 | 6.93 | 6.93 | 248 | WSW | 10.9 | 7.38 | 21.6 | 49 | 79 | 13.8 | 537.2 | 979.4 | CAL:016 | 0.5 | 6.93 | 248 | 1 | 1803 | 0 | 1 | 1 | 1.2 | 1 |
| WRBS | 03/11/2023 11:05 | 31105 | 6.93 | 4.92 | 293 | WNW | 10.9 | 7.38 | 21.5 | 49 | 79 | 13.8 | 537.2 | 979.4 | CAL:016 | 0.6 | 6.93 | 270 | 10 | 10.9 | 10.9 | 1 | 1 | 1.3 | 1 |
| WRBS | 03/11/2023 11:06 | 31106 | 10.07 | 8.05 | 293 | WNW | 10.9 | 7.38 | 21.6 | 49 | 79 | 13.8 | 537.2 | 979.4 | CAL:016 | 0 | 10.07 | 293 | 23 | 10.9 | 10.9 | 0 | 0 | 0 | 0 |
| WRBS | 03/11/2023 11:07 | 31107 | 12.08 | 8.95 | 293 | WNW | 10.9 | 7.38 | 21.6 | 49 | 79 | 13.8 | 537.2 | 979.4 | CAL:016 | 0 | 12.08 | 270 | 24 | 10.9 | 10.8 | 0 | 0 | 0 | 0 |
| WRBS | 03/11/2023 11:08 | 31108 | 8.95 | 6.04 | 270 | W | 10.9 | 7.38 | 21.5 | 49 | 79 | 13.8 | 537.2 | 979.4 | CAL:016 | 0 | 8.95 | 248 | 23 | 10.9 | 10.8 | 0 | 0 | 0 | 0 |
| WRBS | 03/11/2023 11:09 | 31109 | 8.95 | 6.93 | 293 | WNW | 10.9 | 7.38 | 21.5 | 49 | 79 | 13.8 | 537.2 | 979.4 | CAL:016 | 0 | 8.95 | 293 | 19 | 10.9 | 10.8 | 0 | 0 | 0 | 0 |
| WRBS | 03/11/2023 11:10 | 31110 | 10.96 | 6.04 | 270 | W | 10.9 | 7.38 | 21.5 | 49 | 79 | 13.8 | 537.2 | 979.51 | CAL:016 | 0 | 10.96 | 293 | 24 | 10.9 | 10.8 | 0 | 0 | 0 | 0 |
| WRBS | 03/11/2023 11:11 | 31111 | 12.97 | 8.95 | 270 | W | 10.9 | 7.38 | 21.5 | 49 | 79 | 13.8 | 537.2 | 979.4 | CAL:016 | 0 | 12.97 | 293 | 23 | 10.9 | 10.8 | 0 | 0 | 0 | 0 |
| WRBS | 03/11/2023 11:12 | 31112 | 14.09 | 8.95 | 270 | W | 10.9 | 7.38 | 21.5 | 49 | 79 | 13.8 | 537.2 | 979.4 | CAL:016 | 0 | 14.09 | 270 | 23 | 10.9 | 10.8 | 0 | 0 | 0 | 0 |
| WRBS | 03/11/2023 11:13 | 31113 | 10.96 | 8.05 | 270 | W | 10.9 | 7.38 | 21.5 | 49 | 79 | 13.8 | 537.2 | 979.4 | CAL:016 | 0 | 10.96 | 270 | 23 | 10.9 | 10.9 | 0 | 0 | 0 | 0 |
| WRBS | 03/11/2023 11:14 | 31114 | 14.99 | 8.95 | 270 | W | 10.9 | 7.38 | 21.5 | 49 | 79 | 13.8 | 537.2 | 979.4 | CAL:016 | 0 | 14.99 | 270 | 23 | 10.9 | 10.9 | 0 | 0 | 0 | 0 |
| WRBS | 03/11/2023 11:15 | 31115 | 14.09 | 10.07 | 270 | W | 10.9 | 7.38 | 21.5 | 49 | 79 | 13.8 | 537.2 | 979.4 | CAL:016 | 0.8 | 14.09 | 270 | 24 | 10.9 | 10.9 | 1 | 0 | 0 | 0 |
| WRBS | 03/11/2023 11:16 | 31116 | 10.07 | 6.93 | 270 | W | 10.9 | 7.38 | 21.5 | 49 | 79 | 13.8 | 537.2 | 979.31 | CAL:016 | 0.8 | 10.07 | 225 | 23 | 10.9 | 10.9 | 1 | 0 | 0.1 | 0 |
| WRBS | 03/11/2023 11:17 | 31117 | 12.08 | 6.93 | 270 | W | 10.9 | 7.38 | 21.5 | 49 | 79 | 13.8 | 537.2 | 979.31 | CAL:016 | 0.8 | 12.08 | 248 | 24 | 10.9 | 10.9 | 1 | 0 | 0.1 | 0 |
| WRBS | 03/11/2023 11:18 | 31118 | 10.96 | 8.05 | 270 | W | 10.9 | 7.38 | 21.5 | 49 | 79 | 13.8 | 537.2 | 979.31 | CAL:016 | 0.8 | 10.96 | 270 | 23 | 11 | 10.9 | 1 | 0 | 0.2 | 0 |
| WRBS | 03/11/2023 11:19 | 31119 | 8.95 | 6.93 | 270 | W | 11 | 7.48 | 21.5 | 50 | 79 | 13.8 | 537.2 | 979.4 | CAL:016 | 0.8 | 8.95 | 270 | 19 | 11 | 11 | 1 | 0 | 0.2 | 0 |
| WRBS | 03/11/2023 11:20 | 31120 | 10.07 | 8.05 | 270 | W | 11.1 | 7.76 | 21.5 | 50 | 80 | 13.8 | 537.2 | 979.4 | CAL:015 | 0.7 | 10.07 | 248 | 23 | 11.1 | 11 | 1 | 0 | 0.2 | 0 |
| WRBS | 03/11/2023 11:21 | 31121 | 10.96 | 8.05 | 270 | W | 11.1 | 7.58 | 21.5 | 50 | 79 | 13.8 | 537.2 | 979.4 | CAL:016 | 0.6 | 10.96 | 248 | 23 | 11.1 | 11.1 | 1 | 0 | 0.3 | 0 |
| WRBS | 03/11/2023 11:22 | 31122 | 8.95 | 6.04 | 270 | W | 11.1 | 7.58 | 21.5 | 50 | 79 | 13.8 | 537.2 | 979.4 | CAL:016 | 0.7 | 8.95 | 248 | 24 | 11.1 | 11.1 | 1 | 0 | 0.3 | 0 |
| WRBS | 03/11/2023 11:23 | 31123 | 8.05 | 4.92 | 270 | W | 11.1 | 7.58 | 21.5 | 50 | 79 | 13.8 | 537.2 | 979.4 | CAL:016 | 0.8 | 8.05 | 270 | 23 | 11.1 | 11.1 | 1 | 0 | 0.4 | 0 |
| WRBS | 03/11/2023 11:24 | 31124 | 8.05 | 4.92 | 270 | W | 11.2 | 7.67 | 21.5 | 50 | 79 | 13.8 | 537.2 | 979.4 | CAL:016 | 0.8 | 8.05 | 293 | 24 | 11.2 | 11.1 | 1 | 0 | 0.4 | 0 |
| WRBS | 03/11/2023 11:25 | 31125 | 4.92 | 2.91 | 270 | W | 11.2 | 7.67 | 21.5 | 50 | 79 | 13.8 | 537.2 | 979.4 | CAL:016 | 0.8 | 4.92 | 248 | 23 | 11.2 | 11.2 | 1 | 0 | 0.4 | 0 |
| WRBS | 03/11/2023 11:26 | 31126 | 6.04 | 4.03 | 270 | W | 11.2 | 7.67 | 21.5 | 50 | 79 | 13.8 | 537.2 | 979.51 | CAL:016 | 0.8 | 6.04 | 270 | 23 | 11.2 | 11.2 | 1 | 0 | 0.5 | 0 |
| WRBS | 03/11/2023 11:27 | 31127 | 4.92 | 2.01 | 248 | WSW | 11.3 | 7.77 | 21.5 | 50 | 79 | 13.8 | 537.2 | 979.51 | CAL:016 | 0.9 | 4.92 | 270 | 24 | 11.3 | 11.2 | 1 | 1 | 0.5 | 1 |
| WRBS | 03/11/2023 11:28 | 31128 | 10.96 | 4.03 | 270 | W | 11.3 | 7.96 | 21.5 | 50 | 80 | 13.8 | 537.2 | 979.6 | CAL:015 | 0.8 | 10.96 | 270 | 19 | 11.3 | 11.3 | 1 | 1 | 0.6 | 1 |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| WRBS | 03/11/2023 11:29 | 31129 | 10.96 | 8.05 | 270 | W | 11.4 | 8.05 | 21.5 | 50 | 80 | 13.8 | 537.2 | 979.6 | CAL:015 | 0.9 | 10.96 | 315 | 24 | 11.4 | 11.3 | 1 | 1 | 0.6 | 1 |
| WRBS | 03/11/2023 11:30 | 31130 | 6.93 | 6.04 | 270 | W | 11.4 | 7.87 | 21.5 | 50 | 79 | 13.8 | 537.2 | 979.51 | CAL:016 | 0.9 | 6.93 | 270 | 23 | 11.4 | 11.4 | 1 | 1 | 0.6 | 1 |
| WRBS | 03/11/2023 11:31 | 31131 | 6.93 | 4.03 | 270 | W | 11.5 | 7.96 | 21.5 | 50 | 79 | 13.8 | 537.2 | 979.51 | CAL:016 | 0.7 | 6.93 | 270 | 24 | 11.5 | 11.4 | 1 | 1 | 0.7 | 1 |
| WRBS | 03/11/2023 11:32 | 31132 | 10.07 | 4.92 | 225 | SW | 11.6 | 8.06 | 21.5 | 50 | 79 | 13.8 | 537.2 | 979.6 | CAL:016 | 0.7 | 10.07 | 248 | 22 | 11.6 | 11.5 | 1 | 1 | 0.7 | 1 |
| WRBS | 03/11/2023 11:33 | 31133 | 12.97 | 8.95 | 248 | WSW | 11.6 | 8.06 | 21.5 | 50 | 79 | 13.8 | 537.2 | 979.6 | CAL:016 | 0.7 | 12.97 | 248 | 23 | 11.6 | 11.6 | 1 | 1 | 0.8 | 1 |
| WRBS | 03/11/2023 11:34 | 31134 | 10.96 | 6.93 | 248 | WSW | 11.7 | 8.16 | 21.5 | 50 | 79 | 13.8 | 537.2 | 979.6 | CAL:016 | 0.8 | 10.96 | 270 | 22 | 11.7 | 11.6 | 1 | 1 | 0.8 | 1 |
| WRBS | 03/11/2023 11:35 | 31135 | 10.07 | 8.05 | 270 | W | 11.7 | 7.97 | 21.5 | 50 | 78 | 13.8 | 537.2 | 979.6 | CAL:016 | 0.9 | 10.07 | 270 | 23 | 11.7 | 11.7 | 1 | 1 | 0.8 | 1 |
| WRBS | 03/11/2023 11:36 | 31136 | 8.05 | 6.04 | 270 | W | 11.7 | 7.97 | 21.5 | 50 | 78 | 13.8 | 537.2 | 979.6 | CAL:016 | 0.6 | 8.05 | 270 | 24 | 11.7 | 11.7 | 1 | 1 | 0.9 | 1 |
| WRBS | 03/11/2023 11:37 | 31137 | 8.05 | 6.93 | 270 | W | 11.7 | 7.97 | 21.5 | 50 | 78 | 13.8 | 537.2 | 979.6 | CAL:016 | 0.6 | 8.05 | 270 | 22 | 11.7 | 11.7 | 1 | 1 | 0.9 | 1 |
| WRBS | 03/11/2023 11:38 | 31138 | 6.93 | 4.92 | 225 | SW | 11.7 | 7.97 | 21.5 | 50 | 78 | 13.8 | 537.2 | 979.6 | CAL:016 | 0.6 | 6.93 | 248 | 18 | 11.7 | 11.7 | 1 | 1 | 1 | 1 |
| WRBS | 03/11/2023 11:39 | 31139 | 12.08 | 8.05 | 248 | WSW | 11.8 | 8.07 | 21.5 | 49 | 78 | 13.8 | 537.2 | 979.6 | CAL:016 | 0.6 | 12.08 | 225 | 24 | 11.8 | 11.7 | 1 | 1 | 1 | 1 |
| WRBS | 03/11/2023 11:40 | 31140 | 12.08 | 8.95 | 248 | WSW | 11.8 | 8.07 | 21.5 | 49 | 78 | 13.8 | 537.2 | 979.6 | CAL:016 | 0.5 | 12.08 | 270 | 22 | 11.8 | 11.7 | 1 | 1 | 1 | 1 |
| WRBS | 03/11/2023 11:41 | 31141 | 10.07 | 6.93 | 270 | W | 11.8 | 8.07 | 21.5 | 49 | 78 | 13.8 | 537.2 | 979.71 | CAL:016 | 0.6 | 10.07 | 248 | 23 | 11.8 | 11.8 | 1 | 1 | 1.1 | 1 |
| WRBS | 03/11/2023 11:42 | 31142 | 10.96 | 6.04 | 248 | WSW | 11.8 | 7.88 | 21.5 | 49 | 77 | 13.8 | 537.2 | 979.71 | CAL:017 | 0.6 | 10.96 | 248 | 23 | 11.8 | 11.8 | 1 | 1 | 1.1 | 1 |
| WRBS | 03/11/2023 11:43 | 31143 | 6.93 | 4.03 | 225 | SW | 11.8 | 8.07 | 21.5 | 49 | 78 | 13.8 | 537.2 | 979.71 | CAL:016 | 0.6 | 6.93 | 248 | 21 | 11.8 | 11.7 | 1 | 1 | 1.1 | 1 |
| WRBS | 03/11/2023 11:44 | 31144 | 12.08 | 6.93 | 270 | W | 11.8 | 8.07 | 21.5 | 49 | 78 | 13.8 | 537.2 | 979.6 | CAL:016 | 0.6 | 12.08 | 270 | 24 | 11.8 | 11.8 | 1 | 1 | 1.2 | 1 |
| WRBS | 03/11/2023 11:45 | 31145 | 14.09 | 8.95 | 270 | W | 11.8 | 7.88 | 21.5 | 49 | 77 | 13.8 | 537.2 | 979.71 | CAL:017 | 0.6 | 14.09 | 270 | 23 | 11.8 | 11.8 | 1 | 1 | 1.2 | 1 |
| WRBS | 03/11/2023 11:46 | 31146 | 10.07 | 6.04 | 293 | WNW | 11.8 | 7.88 | 21.5 | 49 | 77 | 13.8 | 537.2 | 979.71 | CAL:017 | 0.5 | 10.07 | 293 | 24 | 11.8 | 11.8 | 1 | 1 | 1.2 | 1 |
| WRBS | 03/11/2023 11:47 | 31147 | 10.96 | 8.05 | 293 | WNW | 11.8 | 7.88 | 21.4 | 49 | 77 | 13.8 | 537.2 | 979.71 | CAL:017 | 0.5 | 10.96 | 270 | 19 | 11.8 | 11.8 | 1 | 1 | 1.3 | 1 |
| WRBS | 03/11/2023 11:48 | 31148 | 6.93 | 4.92 | 270 | W | 11.8 | 7.88 | 21.4 | 49 | 77 | 13.8 | 537.2 | 979.8 | CAL:017 | 0.5 | 6.93 | 270 | 23 | 11.8 | 11.8 | 1 | 1 | 1.3 | 1 |
| WRBS | 03/11/2023 11:49 | 31149 | 6.04 | 4.92 | 270 | W | 11.8 | 7.88 | 21.4 | 49 | 77 | 13.8 | 537.2 | 979.8 | CAL:017 | 0.5 | 6.04 | 270 | 23 | 11.8 | 11.8 | 1 | 1 | 1.3 | 1 |
| WRBS | 03/11/2023 11:50 | 31150 | 6.93 | 6.04 | 270 | W | 11.8 | 7.88 | 21.5 | 49 | 77 | 13.8 | 537.2 | 979.8 | CAL:017 | 0.6 | 6.93 | 248 | 23 | 11.8 | 11.8 | 1 | 1 | 1.3 | 1 |
| WRBS | 03/11/2023 11:51 | 31151 | 4.92 | 4.03 | 270 | W | 11.8 | 7.88 | 21.4 | 49 | 77 | 13.8 | 537.2 | 979.8 | CAL:017 | 0.6 | 4.92 | 270 | 24 | 11.8 | 11.8 | 1 | 1 | 1.4 | 1 |
| WRBS | 03/11/2023 11:52 | 31152 | 6.93 | 4.92 | 270 | W | 11.8 | 7.88 | 21.4 | 49 | 77 | 13.8 | 537.2 | 979.8 | CAL:017 | 0.6 | 6.93 | 270 | 16 | 11.8 | 11.8 | 1 | 1 | 1.4 | 1 |
| WRBS | 03/11/2023 11:53 | 31153 | 0 | 0 | | N | 11.8 | 7.88 | 21.4 | 49 | 77 | 13.8 | 537.2 | 979.8 | CAL:017 | 0.6 | 0 | | 0 | 1803 | 0 | 1 | 1 | 1.5 | 1 |
| WRBS | 03/11/2023 11:54 | 31154 | 6.04 | 6.04 | 248 | WSW | 11.8 | 7.88 | 21.4 | 49 | 77 | 13.8 | 537.2 | 979.8 | CAL:017 | 0.6 | 6.04 | 248 | 2 | 1803 | 0 | 1 | 2 | 1.5 | 2 |
| WRBS | 03/11/2023 11:55 | 31155 | 10.07 | 6.04 | 270 | W | 11.9 | 7.97 | 21.5 | 49 | 77 | 13.8 | 537.2 | 979.8 | CAL:017 | 0.6 | 10.07 | 315 | 23 | 11.9 | 11.8 | 1 | 2 | 1.5 | 2 |
| WRBS | 03/11/2023 11:56 | 31156 | 14.09 | 8.05 | 270 | W | 11.9 | 7.97 | 21.4 | 49 | 77 | 13.8 | 537.2 | 979.8 | CAL:017 | 0.7 | 14.09 | 248 | 22 | 11.9 | 11.9 | 1 | 2 | 1.6 | 2 |
| WRBS | 03/11/2023 11:57 | 31157 | 10.07 | 6.93 | 270 | W | 11.8 | 7.88 | 21.4 | 49 | 77 | 13.8 | 537.2 | 979.8 | CAL:017 | 0.7 | 10.07 | 270 | 18 | 11.8 | 11.8 | 1 | 2 | 1.6 | 2 |
| WRBS | 03/11/2023 11:58 | 31158 | 10.96 | 6.93 | 248 | WSW | 11.8 | 7.88 | 21.4 | 49 | 77 | 13.8 | 537.2 | 979.8 | CAL:017 | 0.6 | 10.96 | 270 | 24 | 11.8 | 11.8 | 1 | 2 | 1.7 | 2 |
| WRBS | 03/11/2023 11:59 | 31159 | 10.96 | 8.95 | 248 | WSW | 11.8 | 7.69 | 21.4 | 49 | 76 | 13.8 | 537.2 | 979.8 | CAL:018 | 0.6 | 10.96 | 270 | 23 | 11.8 | 11.8 | 1 | 2 | 1.7 | 2 |
| WRBS | 03/11/2023 12:00 | 31200 | 8.95 | 6.04 | 293 | WNW | 11.8 | 7.88 | 21.4 | 49 | 77 | 13.8 | 537.2 | 979.8 | CAL:017 | 0.6 | 8.95 | 270 | 24 | 11.8 | 11.8 | 1 | 2 | 1.7 | 2 |

# APPENDIX C
# Photograph Sheet

**MONITORING PHOTOGRAPH RECORD**

**Site:** FCC Bryn Lane Phase 1—IVC **Date:** 03/11/2023

**Title:** Bioaerosol Sampling **Ref:** BLP11303

Upwind 001 location looking towards site

Upwind 001 location looking away from site

Downwind 002 location looking towards site

Downwind 002 location looking away from site

Sensitive Receptor 003 location looking towards site

Sensitive Receptor 003 location looking away from site

APPENDIX D
Laboratory Certificate

SOUTHERN MICROBIOLOGICAL SERVICES LTD
Unit3, Georges Farm, West Buckland, Wellington, Somerset, TA21 9LE
Telephone: 01823 662062 Fax: 01823 660505
Email: laboratory@smslab.co.uk Website: www.smslab.co.uk

Enitial
Enterprise Drive
Four Ashes,
Wolverhampton
WV10 7DE

# TEST REPORT

Report Reference: 1231101003
Date Reported: 09 November 2023


**Enitial Anderson Plates PO-ENI103841 Date Sampled: 03.11.23 Site: Bryn Lane Phase 1 MBT**

| | | | | | | * | * | |
|---|---|---|---|---|---|---|---|---|
| SMS Reference | Date Tested | Sample Code | Sample Details | Ltrs of Air filtered | Further Details 2 | *TVC cfu/m3 (2 day pr* | *Asp fumigatus cfu/m3* | *Gram neg Bacteria cf* |
| 1231105058 | 06/11/23 | P1UW001BIO AEM (93.) | --- | 141.5 | --- | 336 cfu/m3 | | |
| 1231105059 | 06/11/23 | P1UW001BIO AEM (94.) | --- | 141.5 | --- | | < 7 cfu/m3 | |
| 1231105060 | 06/11/23 | P1UW001BIO AEM (VR.) | --- | 141.5 | --- | | | < 7 cfu/m3 |
| 1231105061 | 06/11/23 | P1UW001BIO AEM (93.A) | --- | 141.5 | --- | 49 cfu/m3 | | |
| 1231105062 | 06/11/23 | P1UW001BIO AEM (94.A) | --- | 141.5 | --- | | < 7 cfu/m3 | |
| 1231105063 | 06/11/23 | P1UW001BIO AEM (VR.A) | --- | 141.5 | --- | | | 56 cfu/m3 |

**Enitial Anderson Plates PO-ENI103841 Date Sampled: 03.11.23 Site: Bryn Lane Phase 1 MBT**

| | | | | | | * | * | |
|---|---|---|---|---|---|---|---|---|
| SMS Reference | Date Tested | Sample Code | Sample Details | Ltrs of Air filtered | Further Details 2 | *TVC cfu/m3 (2 day pr* | *Asp fumigatus cfu/m3* | *Gram neg Bacteria cf* |
| 1231105064 | 06/11/23 | P1UW001BIO AEM (93.B) | --- | 141.5 | --- | 35 cfu/m3 | | |
| 1231105065 | 06/11/23 | P1UW001BIO AEM (94.B) | --- | 141.5 | --- | | < 7 cfu/m3 | |
| 1231105066 | 06/11/23 | P1UW001BIO AEM (VR.V) | --- | 141.5 | --- | | | 28 cfu/m3 |
| 1231105067 | 06/11/23 | P1DW002BIO AEM (93.) | --- | 141.5 | --- | 63 cfu/m3 | | |
| 1231105068 | 06/11/23 | P1DW002BIO AEM (94.) | --- | 141.5 | --- | | < 7 cfu/m3 | |
| 1231105069 | 06/11/23 | P1DW002BIO AEM (VR.) | --- | 141.5 | --- | | | < 7 cfu/m3 |
| 1231105070 | 06/11/23 | P1DW002BIO AEM (93.A) | --- | 141.5 | --- | 126 cfu/m3 | | |
| 1231105071 | 06/11/23 | P1DW002BIO AEM (94.A) | --- | 141.5 | --- | | < 7 cfu/m3 | |
| 1231105072 | 06/11/23 | P1DW002BIO AEM (VR.A) | --- | 141.5 | --- | | | 56 cfu/m3 |
| 1231105073 | 06/11/23 | P1DW002BIO AEM (93.B) | --- | 141.5 | --- | 77 cfu/m3 | | |
| 1231105074 | 06/11/23 | P1DW002BIO AEM (94.B) | --- | 141.5 | --- | | < 7 cfu/m3 | |
| 1231105075 | 06/11/23 | P1DW002BIO AEM (VR.B) | --- | 141.5 | --- | | | 35 cfu/m3 |

**Enitial Anderson Plates PO-ENI103841 Date Sampled: 03.11.23 Site: Bryn Lane Phase 1 MBT**

* *

| SMS Reference | Date Tested | Sample Code | Sample Details | Ltrs of Air filtered | Further Details 2 | *TVC cfu/m3 (2 day pr* | *Asp fumigatus cfu/m3* | *Gram neg Bacteria cf* |
|---|---|---|---|---|---|---|---|---|
| 1231105076 | 06/11/23 | P1SR003BIOAEM (93.) | --- | 141.5 | --- | 140 cfu/m3 | | |
| 1231105077 | 06/11/23 | P1SR003BIOAEM (94.) | --- | 141.5 | --- | | < 7 cfu/m3 | |
| 1231105078 | 06/11/23 | P1SR003BIOAEM (VR.) | --- | 141.5 | --- | | | 28 cfu/m3 |
| 1231105079 | 06/11/23 | P1SR003BIOAEM (93.A) | --- | 141.5 | --- | 56 cfu/m3 | | |
| 1231105080 | 06/11/23 | P1SR003BIOAEM (94.A) | --- | 141.5 | --- | | < 7 cfu/m3 | |
| 1231105081 | 06/11/23 | P1SR003BIOAEM (VR.A) | --- | 141.5 | --- | | | 21 cfu/m3 |
| 1231105082 | 06/11/23 | P1SR003BIOAEM (93.B) | --- | 141.5 | --- | 14 cfu/m3 | | |
| 1231105083 | 06/11/23 | P1SR003BIOAEM (94.B) | --- | 141.5 | --- | | < 7 cfu/m3 | |
| 1231105084 | 06/11/23 | P1SR003BIOAEM (VR.B) | --- | 141.5 | --- | | | 42 cfu/m3 |

**Enitial Anderson Plates PO-ENI103841 Date Sampled: 03.11.23 Site: Bryn Lane**
**Phase 1 MBT**

| | | | | | | * | * |
|---|---|---|---|---|---|---|---|
| SMS Reference | Date Tested | Sample Code | Sample Details | Ltrs of Air filtered | Further Details 2 | *TVC cfu/m3 (2 day pr* | *Asp fumigatus cfu/m3* | *Gram neg Bacteria cf* |

Unless otherwise indicated, all samples were received in good condition, tests were performed at the above address and results apply to the sample as received. Date tested equals date received.

Where there is a greater than 40% difference in bacterial duplicates, these are genuine results.

Carol Macready
Technical Administration Manager

* Tests marked with a * in this report are not included in the UKAS Accreditation Schedule for our laboratory

SOUTHERN MICROBIOLOGICAL SERVICES LTD
Unit3, Georges Farm, West Buckland, Wellington, Somerset, TA21 9LE
Telephone: 01823 662062 Fax: 01823 660505
Email: laboratory@smslab.co.uk Website: www.smslab.co.uk

Enitial
Enterprise Drive
Four Ashes,
Wolverhampton
WV10 7DE

# TEST REPORT

Report Reference: 1231101004
Date Reported: 09 November 2023


**Enitial Anderson Plates Controls PO-ENI103841 Date Sampled: 03.11.23 Site: Bryn Lane Phase 1 MBT**

| SMS Reference | Date Tested | Sample Code | Sample Details | Ltrs of Air filtered | Further Details 2 | *TVC/plate* | *Asp. Fumigatus Plate* | *Gram neg bacteria Pl* |
|---|---|---|---|---|---|---|---|---|
| 1231105085 | 06/11/23 | P1CONTROL BIOAEM (93-C) | --- | --- | --- | < 1 cfu / plate | | |
| 1231105086 | 06/11/23 | P1CONTROL BIOAEM (94-C) | --- | --- | --- | | < 1 cfu / plate | |
| 1231105087 | 06/11/23 | P1CONTROL BIOAEM (VR-C) | --- | --- | --- | | | < 1 cfu / plate |
| 1231105088 | 06/11/23 | P1FIELDBIOAEM (93-F) | --- | --- | --- | < 1 cfu / plate | | |
| 1231105089 | 06/11/23 | P1FIELDBIOAEM (94-F) | --- | --- | --- | | < 1 cfu / plate | |
| 1231105090 | 06/11/23 | P1FIELDBIOAEM (VR-F) | --- | --- | --- | | | < 1 cfu / plate |

**Enitial Anderson Plates Controls PO-ENI103841 Date Sampled: 03.11.23 Site: Bryn Lane Phase 1 MBT**



| SMS Reference | Date Tested | Sample Code | Sample Details | Ltrs of Air filtered | Further Details 2 | *TVC/plate* | *Asp. Fumigatus Plate* | *Gram neg bacteria Pl* |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |

Unless otherwise indicated, all samples were received in good condition, tests were performed at the above address and results apply to the sample as received. Date tested equals date received.

Carol Macready
Technical Administration Manager