



Bioaerosol Sampling Report 2021

FCC Environment

Bryn Lane IVC (Phase 1)

06th October 2021

Enterprise Drive
Four Ashes
Wolverhampton
WV10 7DE
www.enitial.co.uk



Approval Sheet



Customer: FCC Environment

Site: Bryn Lane IVC,
Wrexham Recycling Park,
Bryn Lane, Wrexham
LL13 9UT

Project title: Bioaerosols Sampling

Project Manager: E. Cracknell

Project Staff: A. Hammersley, E. Turnor, P. Mullineaux

Address: enitial
Enterprise Drive
Four Ashes
Wolverhampton
WV10 7DE

Tel: 01902 798798

Fax: 01902 798711

Issue	Status	Date	Prepared By	Signature	Date
1	Final	29/10/2021	A. Hammersley		29/10/2021
			Approved By	Signature	Date
			E. Cracknell		29/10/2021

Foreword

enital 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.

enital 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. enital 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.

Contents

Scope of Work.....	5
Background.....	6
Sampling Locations.....	7
Equipment	7
Agar	8
Cleaning of Sampling Equipment	8
Setup and Operation of Sampling Equipment.....	9
Presentation of Data	11
Bioaerosol Monitoring Field Sampling Report	12
Meteorological Monitoring Summary	12
Site Description.....	13
Field Sampling Comments	14
Deviations from Methods	14
Field Sampling Record.....	15
Field Sample Results.....	18
Summary of Analytical Results	19

Appendices

A	Aerial Plan
B	Meteorological Conditions & Weather Data
C	Photograph Sheet
D	Laboratory Certificate

Scope of Work

enital 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 Natural Resources Wales (NRW).

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 06th October 2021. This document is a presentation of the resulting data.

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/m³
- *Aspergillus Fumigatus*: 500 cfu/m³
- Gram Negative Bacteria: 300 cfu/m³

Sampling Locations

The sampling locations have been set by NRW and FCC and were determined to achieve:

- One sampling location directly upwind of the centre of the IVC facility.
- One location directly downwind of the IVC facility.
- One location at the nearest sensitive receptor, being the Council Yard and Offices.

Equipment

The equipment used is as follows:

- Continuous operation mobile weather station (wind speed, direction, temperature, humidity) and tripod
- Digital stopwatch
- GPS device
- 3 x single-stage Andersen samplers
- 3 x tripods
- 3 x hemicylindrical baffles
- 3 x stoppers for Andersen samplers
- 3 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

Agar

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.

Cleaning of Sampling 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.

Setup and Operation of Sampling Equipment

- The pumps were Pre-run for a specified time at the required flow rate of 28.3l/min ($\pm 2\%$). 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 ($\pm 2\%$) 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.

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.

Bioaerosol Monitoring Field Sampling Report

Site: Bryn Lane IVC

Site Operator: FCC Environment

Date: 06th October 2021

Start Time: 09:00

Finish Time: 12:00

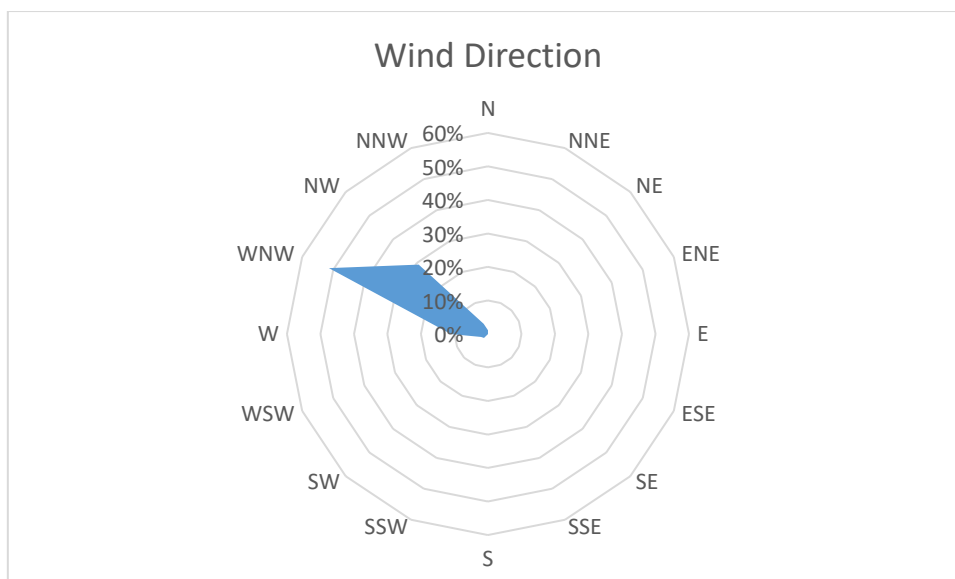
Monitoring Technician ID: A.Hammersley, E. Turnor, P.Mullineaux

Meteorological Monitoring Summary

Table 1- Summary of Meteorological Conditions

Parameter	Wind Direction	Wind Speed (m/s)	Pressure (mb)	Temperature (°C)	Cloud Cover (0-8)
Start	NW	4.0	1019	12	4
Finish	W	4.5	1020	15	4

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



The full minute by minute recorded weather data from the site weather station is shown in Appendix B.

Site Description

FCC Bryn Lane IVC facility is situated inside an industrial estate as part of Wrexham Recycling Park located on Bryn Lane, Wrexham.

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.

Field Sampling Comments

Samples were taken at an upwind, downwind location and at a sensitive receptor (council yard and offices) (see enclosed annotated image Bryn Lane IVC BioA study 06.10.2021) 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.

Upwind location: The upwind sample location was in the car park next to the visitor entrance of the main office by the site boundary fence.

Downwind location: The downwind location was located on a grass area by the site boundary fence near thick vegetation and trees downwind of the IVC.

Sensitive Receptor Location: The sensitive receptor location was placed on a grass area to the south-west site boundary between the IVC and the council offices. It was noted that vegetation of trees, weeds and tall grass was present close to the sample location.

Deviations from methods

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 "Bryn Lane IVC Aerial plan 06/10/2021").

Sampling locations were determined in agreement to the modified sampling strategy as agreed by the NRW regulator and FCC.

Field Sampling Record

Ambient Sampling: Estimated concentration of bioaerosols

Site: Bryn Lane IVC (Phase 1)					Site Operator: FCC Environment					
Sampling Date: 06/10/2021					Monitoring Contractor: Enital					
Estimated Mass of Materials: Unknown					Type of Materials Processed on Site: Green Waste and Compost					
Activities affecting the concentration of Bioaerosols: IVC activities, biofilter stack					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/m³)	Concentration of bioaerosols (CFU/m³)	Concentration of bioaerosols (CFU/m³)	Median of samples		
					Total Count (TVC)	Aspergillus Fumigatus (YM)	Gram Negative Bacteria (GN)	TVC (CFU/m³)	YM (CFU/m³)	GN (CFU/m³)
Upwind (1) SJ 38656 50011	UW001BIOAEM. location car park near office	60m	193°	11:03 – 11:08	63	-	-	63	<7	<7
				11:10 – 11:15	-	<7	-			
				11:17 – 11:22	-	-	<7			
				11:24 – 11:29	42	-	-			
				11:31 – 11:36	-	<7	-			
				11:38 – 11:43	-	-	14			
				11:45 – 11:50	105	-	-			
				11:52 – 11:57	-	<7	-			
				11:29 – 12:04	-	-	<7			

FCC, Bryn Lane IVC (Phase 1) Environmental Bioaerosols Report 2021

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/m³) Total Count (TVC)	Concentration of bioaerosols (CFU/m³) Aspergillus Fumigatus (YM)	Concentration of bioaerosols (CFU/m³) Gram Negative (GN)	Median of samples		
								TVC (CFU/m³)	YM (CFU/m³)	GN (CFU/m³)
Downwind (2) SJ 38694 49923	DW002BIOAEM. location grassy area by fence downwind of IVC	60m	13°	11:03 – 11:08	364	-	-	364	<7	14
				11:10 – 11:15	-	<7	-			
				11:17 – 11:22	-	-	7			
				11:24 – 11:29	560	-	-			
				11:31 – 11:36	-	<7	-			
				11:38 – 11:43	-	-	21			
				11:45 – 11:50	105	-	-			
				11:52 – 11:57	-	<7	-			
				11:29 – 12:04	-	-	14			
Receptor (3) SJ 38638 49910	SR001BIOAEM. Receptor location on grassy area south of IVC near boundary to council offices	93m	74°	11:03 – 11:08	567	-	-	567	<7	<7
				11:10 – 11:15	-	<7	-			
				11:17 – 11:22	-	-	7			
				11:24 – 11:29	728	-	-			
				11:31 – 11:36	-	<7	-			
				11:38 – 11:43	-	-	<7			
				11:45 – 11:50	294	-	-			
				11:52 – 11:57	-	<7	-			
				11:29 – 12:04	-	-	<7			

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)	Concentration of bioaerosols (CFU/m ³)	Concentration of bioaerosols (CFU/m ³)	Median of samples		
					Total Count (TVC)	Aspergillus Fumigatus (YM)	Gram Negative (GN)	TVC (CFU/m ³)	YM (CFU/m ³)	GN (CFU/m ³)
Control	ControlBIOAEM	N/A	N/A	N/A	<1	-	-	N/A	N/A	N/A
	At same location as Upwind				-	<1	-			
					-	-	<1			
Field	FieldBIOAEM.	N/A	N/A	N/A	<1	-	-	N/A	N/A	N/A
	Not removed from package. For QA/QC				-	<1	-			
					-	-	<1			

Field Sample 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 sensitive receptor median results have been calculated and are presented within this table. The process contribution has been calculated by subtracting the upwind median value from the 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 alongside the median result for the sensitive receptor.

Process Contribution Results				
Sample type	Upwind median results	Downwind median highest results	Process Contribution	Sensitive Receptor
Total Bacteria viable Count (TVC)	63	364	301	567
Aspergillus fumigatus (YM)	<7	<7	0	<7
Gram Negative Bacteria (GN)	<7	14	7	<7

Summary of Analytical Results

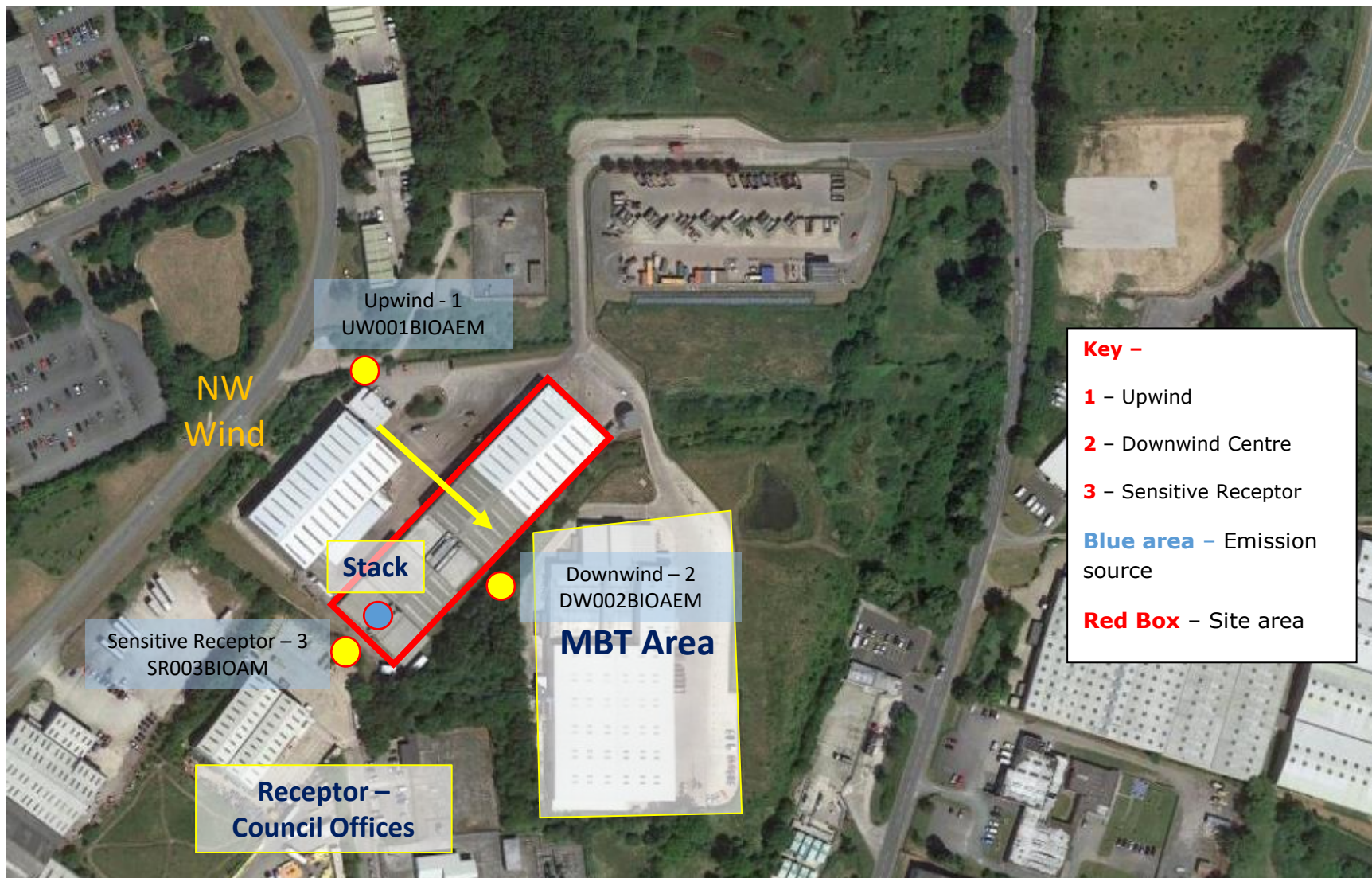
The above reports indicate that at the time of sampling:

1. Mesophilic micro-organisms - Total Viable Count (TVC) shows lower readings at the upwind location compared to the downwind location.
2. *Aspergillus fumigatus* readings were below the limit of detection at all sample locations.
3. Gram Negative bacteria readings shows lower readings at the upwind location compared to the downwind location.
4. Upwind location median results remained below the industry standard threshold values of 1000cfu/m³ for Total Bacteria.
5. Downwind location median process contribution results remained below the industry standard threshold values of 1000cfu/m³ for Total Bacteria.
6. Sensitive receptor location median results remained below the industry standard threshold values of 1000cfu/m³ for Total Bacteria.
7. Upwind location median results remained below the industry standard threshold values of 300cf for Gram Negative bacteria.
8. Downwind location median process contribution results remained below the industry standard threshold values of 300cf for Gram Negative bacteria
9. Sensitive receptor location median results remained below the industry standard threshold values of 300cf for Gram Negative bacteria
10. Upwind location median results remained below the industry standard threshold values of 500cfu/m³ for *Aspergillus Fumigatus*.

11. Downwind location median process contribution results remained below the industry standard threshold values of 500cfu/m³ for *Aspergillus Fumigatus*.
12. Sensitive receptor location median results remained below the industry standard threshold values of 500cfu/m³ for *Aspergillus Fumigatus*.
13. Control and Field blanks for QA/QC did not show any evidence of contamination.

Appendices

Appendix A - Aerial Plan



FCC Environment, Bryn Lane IVC (Phase 1), Bioaerosol Survey 06/10/2021
Aerial Plan Showing Bioaerosol Sample Locations



Appendix B – Meteorological Conditions & Weather Data

METEOROLOGICAL CONDITIONS

SITE:	Bryn Lane IVC (Phase 1)	SITE OPERATOR:	FCC Environment				
SAMPLING DATE:	06/10/2021	COMMISSIONING LABORATORY:	Southern Microbiological Services				
ESTIMATED MASS OF MATERIALS:	Unknown	TYPE OF MATERIALS PROCESSED ON SITE:	Compost and green waste				
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 <u>to</u> 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	327 SJ 38656 50011	134	193	9.7	13.4	71.7
Downwind	DW002BIOAEM	147 SJ 38694 49923	134	13	9.7	13.4	71.7
Sensitive Receptor	SR003BIOAEM	208 SJ 38638 49910	134	74	9.7	13.4	71.7



Raw Weather Station Data for Bryn Lane IVC Phase 1

stationid	timestamp	metardate	wspeed	w10min	wdir	wsector	tout	tdew	tin	hin	hout	rday	rmonth	ryear	rrate	pressure	clouds1	uv	wgust	wgus	wns	touthi	toutlo	uvm	etday	etmon	etyear
WRBS	06/10/2021 09:00	60900	8.95	4.92	315	NW	12.3	8.74	23.6	40	79	0	22	495.8	0	1018.5	CAL:016	0.8	8.95	293	24	12.3	12.3	1	0.96	0.96	0.96
WRBS	06/10/2021 09:01	60901	6.93	4.03	315	NW	12.3	8.74	23.5	40	79	0	22	495.8	0	1018.5	CAL:016	0.9	6.93	293	23	12.3	12.3	1	1	1	1
WRBS	06/10/2021 09:02	60902	8.95	6.04	315	NW	12.3	8.74	23.4	40	79	0	22	495.8	0	1018.5	CAL:016	0.9	8.95	315	24	12.3	12.3	1	1.04	1.04	1.04
WRBS	06/10/2021 09:03	60903	10.96	8.05	315	NW	12.3	8.74	23.3	39	79	0	22	495.8	0	1018.6	CAL:016	0.9	10.96	293	23	12.3	12.3	1	1.08	1.08	1.08
WRBS	06/10/2021 09:04	60904	10.07	8.05	315	NW	12.4	8.84	23.2	39	79	0	22	495.8	0	1018.6	CAL:016	0.9	10.07	315	23	12.4	12.3	1	1.12	1.12	1.12
WRBS	06/10/2021 09:05	60905	10.07	6.93	315	NW	12.4	8.84	23.1	39	79	0	22	495.8	0	1018.6	CAL:016	0.8	10.07	315	24	12.4	12.4	1	1.16	1.16	1.16
WRBS	06/10/2021 09:06	60906	8.05	6.04	315	NW	12.4	8.84	23.1	39	79	0	22	495.8	0	1018.6	CAL:016	0.9	8.05	293	23	12.4	12.4	1	1.2	1.2	1.2
WRBS	06/10/2021 09:07	60907	8.05	4.92	315	NW	12.4	8.84	23	39	79	0	22	495.8	0	1018.6	CAL:016	1	8.05	315	23	12.4	12.4	1	1.26	1.26	1.26
WRBS	06/10/2021 09:08	60908	12.08	6.93	293	WNW	12.4	8.84	22.9	39	79	0	22	495.8	0	1018.6	CAL:016	1	12.08	293	19	12.4	12.4	1	1.32	1.32	1.32
WRBS	06/10/2021 09:09	60909	12.08	8.95	293	WNW	12.5	8.93	22.8	39	79	0	22	495.8	0	1018.6	CAL:016	0.9	12.08	293	22	12.5	12.4	1	1.36	1.36	1.36
WRBS	06/10/2021 09:10	60910	12.97	8.95	293	WNW	12.5	8.93	22.8	39	79	0	22	495.8	0	1018.6	CAL:016	0.9	12.97	293	23	12.5	12.5	1	1.42	1.42	1.42
WRBS	06/10/2021 09:11	60911	12.97	10.07	293	WNW	12.5	8.75	22.7	39	78	0	22	495.8	0	1018.6	CAL:016	0.9	12.97	293	22	12.5	12.5	1	1.46	1.46	1.46
WRBS	06/10/2021 09:12	60912	12.08	8.95	293	WNW	12.4	8.65	22.6	39	78	0	22	495.8	0	1018.6	CAL:016	0.9	12.08	293	24	12.5	12.4	1	1.5	1.5	1.5
WRBS	06/10/2021 09:13	60913	12.08	8.95	315	NW	12.4	8.65	22.5	39	78	0	22	495.8	0	1018.6	CAL:016	1	12.08	315	22	12.4	12.4	1	1.56	1.56	1.56
WRBS	06/10/2021 09:14	60914	10.07	6.93	315	NW	12.4	8.65	22.4	39	78	0	22	495.8	0	1018.6	CAL:016	0.9	10.07	315	22	12.4	12.4	1	1.6	1.6	1.6
WRBS	06/10/2021 09:15	60915	8.95	6.93	293	WNW	12.5	8.75	22.4	39	78	0	22	495.8	0	1018.6	CAL:016	1.2	8.95	293	24	12.5	12.4	1	1.66	1.66	1.66
WRBS	06/10/2021 09:16	60916	10.07	6.93	315	NW	12.5	8.75	22.3	40	78	0	22	495.8	0	1018.6	CAL:016	1.2	10.07	315	23	12.5	12.4	1	1.72	1.72	1.72
WRBS	06/10/2021 09:17	60917	10.07	6.93	315	NW	12.6	8.84	22.3	39	78	0	22	495.8	0	1018.6	CAL:017	1.2	10.07	315	24	12.6	12.5	1	1.78	1.78	1.78
WRBS	06/10/2021 09:18	60918	8.95	6.93	315	NW	12.6	8.84	22.2	40	78	0	22	495.8	0	1018.6	CAL:017	1.3	8.95	338	18	12.6	12.6	1	1.84	1.84	1.84
WRBS	06/10/2021 09:19	60919	12.97	8.95	293	WNW	12.6	8.84	22.2	40	78	0	22	495.8	0	1018.6	CAL:017	1.3	12.97	293	23	12.6	12.6	1	1.9	1.9	1.9
WRBS	06/10/2021 09:20	60920	10.07	6.93	315	NW	12.6	8.84	22.2	41	78	0	22	495.8	0	1018.7	CAL:017	1.3	10.07	315	23	12.6	12.6	1	1.96	1.96	1.96
WRBS	06/10/2021 09:21	60921	8.05	6.04	315	NW	12.7	8.94	22.2	42	78	0	22	495.8	0	1018.6	CAL:017	1.3	8.05	293	22	12.7	12.7	1	2.02	2.02	2.02
WRBS	06/10/2021 09:22	60922	10.07	6.93	315	NW	12.7	8.94	22.2	42	78	0	22	495.8	0	1018.6	CAL:017	1.1	10.07	315	24	12.7	12.7	1	2.08	2.08	2.08
WRBS	06/10/2021 09:23	60923	12.97	8.05	315	NW	12.8	9.04	22.2	43	78	0	22	495.8	0	1018.7	CAL:017	1.3	12.97	315	23	12.8	12.7	1	2.14	2.14	2.14
WRBS	06/10/2021 09:24	60924	14.09	8.05	315	NW	12.8	8.85	22.2	43	77	0	22	495.8	0	1018.6	CAL:017	1.2	14.09	315	24	12.8	12.8	1	2.2	2.2	2.2
WRBS	06/10/2021 09:25	60925	6.93	4.92	338	NNW	12.8	8.85	22.2	43	77	0	22	495.8	0	1018.6	CAL:017	1	6.93	293	23	12.8	12.8	1	2.26	2.26	2.26
WRBS	06/10/2021 09:26	60926	8.95	6.04	338	NNW	12.8	8.85	22.2	43	77	0	22	495.8	0	1018.7	CAL:017	1.1	8.95	315	23	12.8	12.8	1	2.32	2.32	2.32
WRBS	06/10/2021 09:27	60927	6.93	4.03	293	WNW	12.8	8.85	22.2	43	77	0	22	495.8	0	1018.7	CAL:017	1.1	6.93	293	22	12.8	12.8	1	2.38	2.38	2.38
WRBS	06/10/2021 09:28	60928	12.08	8.95	293	WNW	12.8	8.85	22.2	43	77	0	22	495.8	0	1018.7	CAL:017	1.1	12.08	293	18	12.8	12.8	1	2.44	2.44	2.44
WRBS	06/10/2021 09:29	60929	12.97	8.95	293	WNW	12.8	8.85	22.2	42	77	0	22	495.8	0	1018.6	CAL:017	1.1	12.97	293	24	12.8	12.8	1	2.5	2.5	2.5
WRBS	06/10/2021 09:30	60930	8.95	6.04	315	NW	12.8	8.85	22.2	42	77	0	22	495.8	0	1018.7	CAL:017	1.1	8.95	315	23	12.8	12.8	1	2.56	2.56	2.56
WRBS	06/10/2021 09:31	60931	4.92	2.91	315	NW	12.8	8.85	22.2	42	77	0	22	495.8	0	1018.7	CAL:017	1	4.92	315	23	12.8	12.8	1	2.62	2.62	2.62
WRBS	06/10/2021 09:32	60932	10.96	8.05	315	NW	12.8	8.85	22.2	41	77	0	22	495.8	0	1018.7	CAL:017	1.1	10.96	315	22	12.8	12.8	1	2.68	2.68	2.68
WRBS	06/10/2021 09:33	60933	14.09	10.96	315	NW	12.8	8.65	22.1	41	76	0	22	495.8	0	1018.7	CAL:018	1.2	14.09	293	23	12.8	12.8	1	2.74	2.74	2.74
WRBS	06/10/2021 09:34	60934	12.08	10.07	293	WNW	12.8	8.65	22.1	40	76	0	22	495.8	0	1018.8	CAL:018	1.4	12.08	293	24	12.8	12.8	1	2.82	2.82	2.82
WRBS	06/10/2021 09:35	60935	8.95	6.04	293	WNW	12.8	8.65	21.9	40	76	0	22	495.8	0	1018.8	CAL:018	1.2	8.95	315	23	12.8	12.8	1	2.88	2.88	2.88
WRBS	06/10/2021 09:36	60936	10.96	4.92	293	WNW	12.8	8.65	21.8	40	76	0	22	495.8	0	1018.8	CAL:018	1.3	10.96	270	24	12.8	12.8	1	2.94	2.94	2.94
WRBS	06/10/2021 09:37	60937	10.07	6.04	315	NW	12.8	8.85	21.8	39	77	0	22	495.8	0	1018.8	CAL:017	1.2	10.07	293	19	12.8	12.8	1	3	3	3
WRBS	06/10/2021 09:38	60938	8.05	6.04	315	NW	12.8	8.85	21.8	39	77	0	22	495.8	0	1018.8	CAL:017	1.2	8.05	315	22	12.8	12.8	1	3.06	3.06	3.06
WRBS	06/10/2021 09:39	60939	10.96	6.93	338	NNW	12.8	8.85	21.7	39	77	0	22	495.8	0	1018.8	CAL:017	1.5	10.96	338	24	12.8	12.8	2	3.14	3.14	3.14
WRBS	06/10/2021 09:40	60940	12.08	8.95	315	NW	12.8	8.65	21.6	39	76	0	22	495.8	0	1018.9	CAL:018	1.5	12.08	315	23	12.9	12.8	2	3.22	3.22	3.22
WRBS	06/10/2021 09:41	60941	10.96	8.05	315	NW	12.9	8.75	21.5	39	76	0	22	495.8	0	1018.9	CAL:018	1.5	10.96	315	24	12.9	12.8	2	3.3	3.3	3.3
WRBS	06/10/2021 09:42	60942	10.07	6.04	315	NW	12.9	8.94	21.5	40	77	0	22	495.8	0	1018.9	CAL:017	1.3	10.07	315	23	12.9	12.8	1	3.36	3.36	3.36
WRBS	06/10/2021 09:43	60943	12.97	10.07	293	WNW	12.9	8.75	21.4	41	76	0	22	495.8	0	1018.9	CAL:018	1.3	12.97	315	22	12.9	12.9	1	3.42	3.42	3.42
WRBS	06/10/2021 09:44	60944	12.97	6.93	360	N	12.9	8.75	21.3	42	76	0	22	495.8	0	1019	CAL:018	1.5	12.97	315	21	12.9	12.9	2	3.5	3.5	3.5
WRBS	06/10/2021 09:45	60945	16.11	12.97	315	NW	12.9	8.75	21.3	43	76	0	22	495.8	0	1019	CAL:018	1.5	16.11	338	23	12.9	12.9	2	3.58	3.58	3.58
WRBS	06/10/2021 09:46	60946	12.97	8.95	315	NW	12.9	8.75	21.3	43	76	0	22	495.8	0	1019	CAL:018	1.5	12.97	360	24	12.9	12.9	2	3.66	3.66	3.66

Appendix C - Photograph sheet

MONITORING PHOTOGRAPH RECORD

Site: FCC Bryn Lane IVC

Title: Bryn Lane Phase 1 Env Bioa

Ref: BL061021

Date: 06/10/2021

Carried Out By: AH / ET / PM



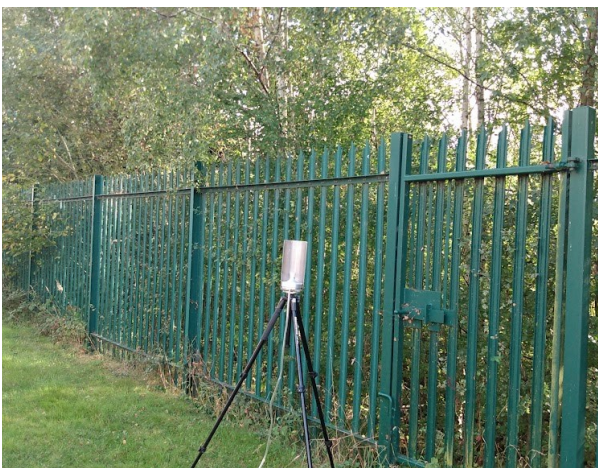
Upwind location 1 – Position of the upwind sampler facing the IVC facility



Upwind location 1 – Position of the upwind sampler facing away from the IVC facility



Downwind location 2 – Position of the downwind sampler, looking towards IVC facility



Downwind location 2 – Position of the downwind sampler, looking away from the IVC facility



Sensitive Receptor location 3 – Position of the receptor sampler, looking towards the IVC facility



Sensitive Receptor location 3 – Position of the receptor sampler looking away from the IVC facility



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

Enital
Enterprise Drive
Four Ashes,
Wolverhampton
WV10 7DE

TEST REPORT

**Enital Anderson Plates PO 93416 Site Bryn Lane Phase 1 IVC Client Suez Date
Sampled 06.10.21**

Report Reference: 1211000876

Date Reported 11 October 2021

Page 1 of 4

* *

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
1211006705	07/10/21	---	UW001BIOAE M(93.)	140	---	63 cfu/m3		
1211006706	07/10/21	---	UW001BIOAE M(94.)	140	---		< 7 cfu/m3	
1211006707	07/10/21	---	UW001BIOAE M(VR.)	140	---			< 7 cfu/m3
1211006708	07/10/21	---	UW001BIOAE M(93.A)	140	---	42 cfu/m3		
1211006709	07/10/21	---	UW001BIOAE M(94.A)	140	---		< 7 cfu/m3	
1211006710	07/10/21	---	UW001BIOAE M(VR.A)	140	---			14 cfu/m3

Enitial Anderson Plates PO 93416 Site Bryn Lane Phase 1 IVC Client Suez Date
Sampled 06.10.21

Report Reference: 1211000876

Date Reported 11 October 2021

Page 2 of 4

* *

<u>SMS Reference</u>	<u>Date Tested</u>	<u>Sample Code</u>	<u>Sample Details</u>	<u>Ltrs of Air filtered</u>	<u>Further Details 2</u>	<u>TVC cfu/m3 (2 day pr</u>	<u>Asp fumigatus cfu/m3</u>	<u>Gram neg Bacteria cf</u>
1211006711	07/10/21	---	UW001BIOAE M(93.B)	140	---	105 cfu/m3		
1211006712	07/10/21	---	UW001BIOAE M(94.B)	140	---		< 7 cfu/m3	
1211006713	07/10/21	---	UW001BIOAE M(VR.B)	140	---			< 7 cfu/m3
1211006714	07/10/21	---	UW002BIOAE M(93.)	140	---	364 cfu/m3		
1211006715	07/10/21	---	UW002BIOAE M(94.)	140	---		< 7 cfu/m3	
1211006716	07/10/21	---	UW002BIOAE M(VR.)	140	---			7 cfu/m3
1211006717	07/10/21	---	UW002BIOAE M(93.A)	140	---	560 cfu/m3		
1211006718	07/10/21	---	UW002BIOAE M(94.A)	140	---		< 7 cfu/m3	
1211006719	07/10/21	---	UW002BIOAE M(VR.A)	140	---			21 cfu/m3
1211006720	07/10/21	---	UW002BIOAE M(93.B)	140	---	105 cfu/m3		
1211006721	07/10/21	---	UW002BIOAE M(94.B)	140	---		< 7 cfu/m3	
1211006722	07/10/21	---	UW002BIOAE M(VR.B)	140	---			14 cfu/m3

Enitial Anderson Plates PO 93416 Site Bryn Lane Phase 1 IVC Client Suez Date
Sampled 06.10.21

Report Reference: 1211000876

Date Reported 11 October 2021

Page 3 of 4

* *

<u>SMS Reference</u>	<u>Date Tested</u>	<u>Sample Code</u>	<u>Sample Details</u>	<u>Ltrs of Air filtered</u>	<u>Further Details 2</u>	<u>TVC cfu/m3 (2 day pr</u>	<u>Asp fumigatus cfu/m3</u>	<u>Gram neg Bacteria cf</u>
1211006723	07/10/21	---	UW003BIOAE M(93.)	140	---	567 cfu/m3		
1211006724	07/10/21	---	UW003BIOAE M(94.)	140	---		< 7 cfu/m3	
1211006725	07/10/21	---	UW003BIOAE M(VR.)	140	---			7 cfu/m3
1211006726	07/10/21	---	UW003BIOAE M(93.A)	140	---	728 cfu/m3		
1211006727	07/10/21	---	UW003BIOAE M(94.A)	140	---		< 7 cfu/m3	
1211006728	07/10/21	---	UW003BIOAE M(VR.A)	140	---			< 7 cfu/m3
1211006729	07/10/21	---	UW003BIOAE M(93.B)	140	---	294 cfu/m3		
1211006730	07/10/21	---	UW003BIOAE M(94.B)	140	---		< 7 cfu/m3	
1211006731	07/10/21	---	UW003BIOAE M(VR.B)	140	---			< 7 cfu/m3

Enitial Anderson Plates PO 93416 Site Bryn Lane Phase 1 IVC Client Suez Date
Sampled 06.10.21

Report Reference: 1211000876

Date Reported 11 October 2021

Page 4 of 4

* *

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

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

Enitial Anderson Plates Controls PO 93416 Site Bryn Lane Phase 1 IVC Client
Suez Date Sampled 06.10.21

Report Reference: 1211000877

Date Reported 11 October 2021

Page 1 of 2

SMS Reference	Date Tested	Sample Code	Sample Details	Ltrs of Air filtered	Further Details 2	TVC/plate	Asp. Fumigatus Plate	Gram neg bacteria PI
1211006732	07/10/21	ControlBioaem (93.C)	---	0	---	< 1 cfu / plate		
1211006733	07/10/21	ControlBioaem (94.C)	---	0	---		< 1 cfu / plate	
1211006734	07/10/21	ControlBioaem (VR.C)	---	0	---			< 1 cfu / plate
1211006735	07/10/21	FieldBioaem (93.F)	---	0	---	< 1 cfu / plate		
1211006736	07/10/21	FieldBioaem (94.F)	---	0	---		< 1 cfu / plate	
1211006737	07/10/21	FieldBioaem (VR.F)	---	0	---			< 1 cfu / plate

Enitial Anderson Plates Controls PO 93416 Site Bryn Lane Phase 1 IVC Client
Suez Date Sampled 06.10.21

Report Reference: 1211000877

Date Reported 11 October 2021

Page 2 of 2

<u>SMS Reference</u>	<u>Date Tested</u>	<u>Sample Code</u>	<u>Sample Details</u>	<u>Ltrs of Air filtered</u>	<u>Further Details 2</u>	<u>TVC/plate</u>	<u>Asp. Fumigatus Plate</u>	<u>Gram neg bacteria PI</u>

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