Bioaerosol Sampling Report 2021

FCC Environment

Bryn Lane MBT (Phase 2)

06th October 2021

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Approval Sheet

Customer: FCC Environment

Site: Bryn Lane MBT,
Wrexham Recycling Park,
Bryn Lane, Wrexham
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Project title: Bioaerosols Sampling

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			Approved By	**Signature**	**Date**
			E. Cracknell		29/10/2021

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.

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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

enitial was tasked with providing Bioaerosol monitoring for FCC Environment at Bryn Lane MBT (Phase 2) 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 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 Household Waste Recycling Centre (HWRC), which is approximately 110-130m from the emission stack with the centre of the HWRC estimated to be 160-165m.

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/m^3
- Aspergillus Fumigatus: 500 cfu/m^3
- Gram Negative Bacteria: 300 cfu/m^3

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 MBT facility.
- One location directly downwind of the MBT facility.
- One location at the nearest sensitive receptor, being the HWRC.

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 (±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.

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 MBT

Site Operator: FCC Environment

Date: 06th October 2021

Start Time: 12:00
Finish Time: 14:15

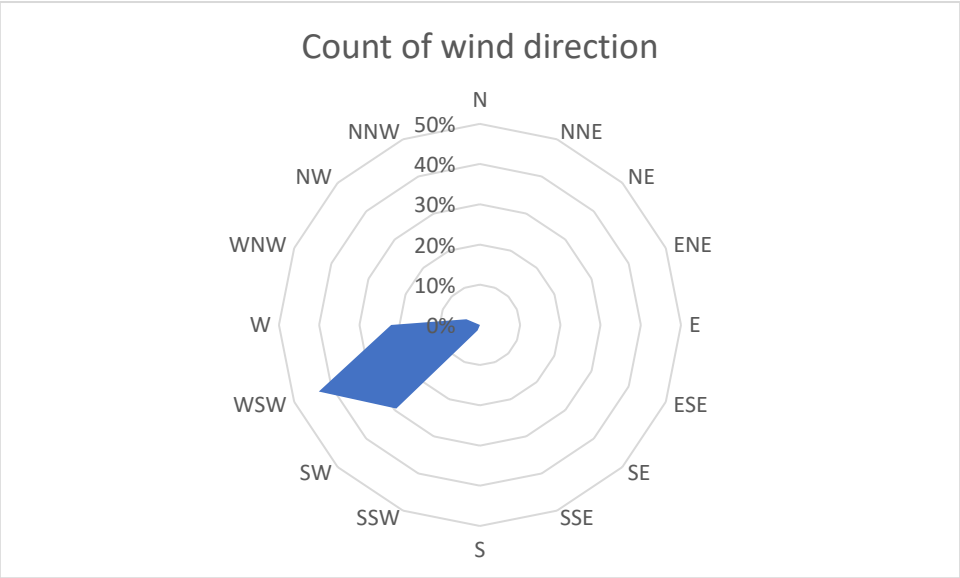
Monitoring Technician ID: A.Hammersley, E. Turnor, P.Mullineaux

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	WNW	6.2	1019	15.8	3
Finish	WSW	4.0	1020	15.8	4

During the monitoring period winds were detected from the south-southwest, southwest, west, west-north-west and west-southwest directions. 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 MBT facility is situated inside an industrial estate as part of Wrexham Recycling Park located on Bryn Lane, Wrexham.

The MBT facility was operating under normal conditions during the sampling period. The nearest sensitive receptor is the Wrexham Household Waste Recycling Centre situated approximately 150m from the MBT facility.

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 MBT 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 was located on a grass verge area next to the haul road upwind of the MBT.

Downwind Location: The downwind location was in the corner of the car park downwind of the MBT next to the boundary fence with tall vegetation and trees close by.

Sensitive Receptor Location: The sensitive receptor location was placed in a grass field near to the solar farm and HWRC. Traffic was noted on the HWRC road near to the 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 MBT 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 MBT (Phase 2)	Site Operator: FCC Environment
Sampling Date: 06/10/2021	Monitoring Contractor: Enitial
Estimated Mass of Materials: Unknown	Type of Materials Processed on Site: Green Waste and Compost
Activities affecting the concentration of Bioaerosols: MBT activities, biofilter stack	Site Activity: Normal MBT 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) **Total Count (TVC)**	Concentration of bioaerosols (CFU/m³) **Aspergillus Fumigatus (YM)**	Concentration of bioaerosols (CFU/m³) **Gram Negative Bacteria (GN)**	Median of samples		
								TVC (CFU/m³)	**YM** (CFU/m³)	**GN** (CFU/m³)
Upwind (1) SJ 387266 49997	UW001BIOAEM. Upwind location grass verge upwind of MBT.	125m	30°	12:43 – 12:48	560	-	-	336	14	98
				12:50 – 12:55	-	14	-			
				12:57 – 13:02	-	-	154			
				13:04– 13:09	210	-	-			
				13:11 – 13:16	-	7	-			
				13:18 – 13:23	-	-	56			
				13:25 – 13:30	336	-	-			
				13:32 – 13:37	-	77	-			
				13:39 – 13:44	-	-	98			

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 38810 49836	DW001BIOAEM. Downwind location corner of car park downwind of MBT.	85m	110°	12:43 – 12:48	161	-	-	266	<7	56
				12:50 – 12:55	-	14	-			
				12:57 – 13:02	-	-	112			
				13:04– 13:09	266	-	-			
				13:11 – 13:16	-	<7	-			
				13:18 – 13:23	-	-	56			
				13:25 – 13:30	280	-	-			
				13:32 – 13:37	-	<7	-			
				13:39 – 13:44	-	-	7			
Receptor (3) SJ 38778 50076	SR001BIOAEM. Receptor location next to HWRC by solar farm.	170m	111°	12:43 – 12:48	504	-	-	504	<7	63
				12:50 – 12:55	-	7	-			
				12:57 – 13:02	-	-	21			
				13:04– 13:09	133	-	-			
				13:11 – 13:16	-	<7	-			
				13:18 – 13:23	-	-	63			
				13:25 – 13:30	616	-	-			
				13:32 – 13:37	-	<7	-			
				13:39 – 13:44	-	-	77			

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)
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			

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)	336	226	**-110**	504
Aspergillus fumigatus (YM)	14	<7	**-7**	<7
Gram Negative Bacteria (GN)	98	56	**-42**	63

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 downwind location compared to the upwind location.

2. Aspergillus fumigatus readings were detected at upwind, downwind and sensitive receptor sample locations.

3. Gram Negative bacteria readings were detected at upwind, downwind and sensitive receptor sample 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 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 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 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 evidence of contamination.

Appendices

Appendix A - Aerial Plan

FCC Environment, Bryn Lane MBT (Phase 2), Bioaerosol Survey 06/10/2021
Aerial Plan Showing Bioaerosol Sample Locations

Appendix B – Meteorological Conditions & Weather Data

METEOROLOGICAL CONDITIONS

SITE:	Bryn Lane MBT (Phase 2)	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 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	143 SJ 38766 49997	113	30	4.0	16	53.9
Downwind	DW002BIOAEM	2 SJ 38810 49836	113	111	4.0	16	53.9
Sensitive Receptor	SR003BIOAEM	3 SJ 38778 50076	113	110	4.0	16	53.9

Raw Weather Station Data for Bryn Lane MBT Phase 2

stationid	datestamp	metardate	wspeed	w10min	wdir	wsector	tout	tdew	tin	hin	hout	rday	rmonth	ryear	rrate	pressure	clouds1	wns	touthi	toutlo	wgus	wgust	etday	etmonth	etyear
WRCL	06/10/2021 12:00	61200	14.09	10.96	293	WNW	15.8	6.21	29.2	31	53	0	21.6	442	0	1019.3	CAL:039	23	15.8	15.8	127	14.09	937.3	999.99	100000
WRCL	06/10/2021 12:01	61201	12.97	10.07	293	WNW	15.8	6.21	29.2	31	53	0	21.6	442	0	1019.2	CAL:039	22	15.8	15.8	127	12.97	938.6	999.99	100000
WRCL	06/10/2021 12:02	61202	14.09	10.07	270	W	15.8	6.21	29.2	31	53	0	21.6	442	0	1019.2	CAL:039	22	15.8	15.8	127	14.09	939.9	999.99	100000
WRCL	06/10/2021 12:03	61203	10.96	8.05	270	W	15.8	6.21	29.2	31	53	0	21.6	442	0	1019.1	CAL:039	17	15.8	15.8	127	10.96	941.2	999.99	100000
WRCL	06/10/2021 12:04	61204	14.09	10.07	293	WNW	15.8	5.93	29.1	31	52	0	21.6	442	0	1019.1	CAL:040	23	15.8	15.8	127	14.09	942.5	999.99	100000
WRCL	06/10/2021 12:05	61205	8.95	8.05	270	W	15.8	6.21	29.2	32	53	0	21.6	442	0	1019.2	CAL:039	22	15.8	15.8	127	8.95	943.8	999.99	100000
WRCL	06/10/2021 12:06	61206	8.95	6.93	293	WNW	15.8	6.21	29.1	32	53	0	21.6	442	0	1019.1	CAL:039	22	15.8	15.7	127	8.95	945.1	999.99	100000
WRCL	06/10/2021 12:07	61207	8.95	6.93	270	W	15.8	6.21	29.1	31	53	0	21.6	442	0	1019.2	CAL:039	23	15.8	15.8	127	8.95	946.4	999.99	100000
WRCL	06/10/2021 12:08	61208	6.04	4.03	270	W	15.8	6.48	29.1	32	54	0	21.6	442	0	1019.2	CAL:038	22	15.8	15.8	127	6.04	947.7	999.99	100000
WRCL	06/10/2021 12:09	61209	6.04	4.03	248	WSW	15.9	6.57	29.1	31	54	0	21.6	442	0	1019.1	CAL:038	23	15.9	15.8	127	6.04	949	999.99	100000
WRCL	06/10/2021 12:10	61210	12.08	6.04	225	SW	16	6.66	29.1	31	54	0	21.6	442	0	1019.2	CAL:038	22	16	15.9	127	12.08	950.3	999.99	100000
WRCL	06/10/2021 12:11	61211	8.05	4.92	225	SW	15.9	6.57	29.1	31	54	0	21.6	442	0	1019.2	CAL:038	23	16	15.9	127	8.05	951.6	999.99	100000
WRCL	06/10/2021 12:12	61212	8.05	4.03	248	WSW	16	6.93	29.2	31	55	0	21.6	442	0	1019.3	CAL:037	18	16	15.9	127	8.05	952.9	999.99	100000
WRCL	06/10/2021 12:13	61213	8.95	6.93	248	WSW	15.9	6.84	29.2	31	55	0	21.6	442	0	1019.3	CAL:037	22	16	15.9	127	8.95	954.2	999.99	100000
WRCL	06/10/2021 12:14	61214	12.08	6.93	248	WSW	15.9	6.57	29.2	31	54	0	21.6	442	0	1019.3	CAL:038	20	15.9	15.9	127	12.08	955.5	999.99	100000
WRCL	06/10/2021 12:15	61215	10.96	8.05	248	WSW	15.8	6.48	29.2	31	54	0	21.6	442	0	1019.5	CAL:038	22	15.9	15.8	127	10.96	956.8	999.99	100000
WRCL	06/10/2021 12:16	61216	10.07	6.93	225	SW	15.8	6.48	29.3	32	54	0	21.6	442	0	1019.3	CAL:038	20	15.8	15.8	127	10.07	958.1	999.99	100000
WRCL	06/10/2021 12:17	61217	12.08	8.05	225	SW	15.8	6.74	29.3	32	55	0	21.6	442	0	1019.2	CAL:037	20	15.8	15.8	127	12.08	959.4	999.99	100000
WRCL	06/10/2021 12:18	61218	6.04	4.03	203	SSW	15.8	6.74	29.3	32	55	0	21.6	442	0	1019.2	CAL:037	22	15.8	15.8	127	6.04	960.7	999.99	100000
WRCL	06/10/2021 12:19	61219	8.95	4.92	248	WSW	15.7	6.65	29.3	32	55	0	21.6	442	0	1019.4	CAL:037	23	15.8	15.7	127	8.95	962	999.99	100000
WRCL	06/10/2021 12:20	61220	8.05	6.04	248	WSW	15.8	6.74	29.3	32	55	0	21.6	442	0	1019.4	CAL:037	23	15.8	15.7	127	8.05	963.3	999.99	100000
WRCL	06/10/2021 12:21	61221	8.95	4.92	225	SW	15.7	6.38	29.3	32	54	0	21.6	442	0	1019.3	CAL:038	21	15.8	15.7	127	8.95	964.6	999.99	100000
WRCL	06/10/2021 12:22	61222	8.05	6.04	270	W	15.7	6.65	29.3	32	55	0	21.6	442	0	1019.3	CAL:037	18	15.7	15.7	127	8.05	965.9	999.99	100000
WRCL	06/10/2021 12:23	61223	8.95	6.93	270	W	15.7	6.38	29.2	32	54	0	21.6	442	0	1019.3	CAL:038	23	15.7	15.7	127	8.95	967.2	999.99	100000
WRCL	06/10/2021 12:24	61224	8.95	6.04	248	WSW	15.7	6.65	29.2	32	55	0	21.6	442	0	1019.3	CAL:037	22	15.8	15.7	127	8.95	968.5	999.99	100000
WRCL	06/10/2021 12:25	61225	8.05	6.04	248	WSW	15.8	6.74	29.2	32	55	0	21.6	442	0	1019.2	CAL:037	23	15.8	15.7	127	8.05	969.8	999.99	100000
WRCL	06/10/2021 12:26	61226	6.93	4.92	248	WSW	15.8	6.74	29.2	32	55	0	21.6	442	0	1019.2	CAL:037	21	15.8	15.8	127	6.93	971.1	999.99	100000
WRCL	06/10/2021 12:27	61227	10.07	4.92	225	SW	15.8	7.01	29.2	32	56	0	21.6	442	0	1019.4	CAL:035	22	15.8	15.8	127	10.07	972.4	999.99	100000
WRCL	06/10/2021 12:28	61228	8.95	4.03	225	SW	15.9	6.84	29.2	32	55	0	21.6	442	0	1019.4	CAL:037	23	15.9	15.8	127	8.95	973.7	999.99	100000
WRCL	06/10/2021 12:29	61229	10.96	8.05	225	SW	15.9	6.84	29.2	32	55	0	21.6	442	0	1019.2	CAL:037	23	15.9	15.8	127	10.96	975	999.99	100000
WRCL	06/10/2021 12:30	61230	12.08	8.95	225	SW	15.9	6.57	29.2	32	54	0	21.6	442	0	1019.3	CAL:038	23	15.9	15.9	127	12.08	976.3	999.99	100000
WRCL	06/10/2021 12:31	61231	10.07	6.93	225	SW	15.9	6.57	29.2	32	54	0	21.6	442	0	1019.4	CAL:038	21	15.9	15.9	127	10.07	977.6	999.99	100000
WRCL	06/10/2021 12:32	61232	8.05	4.92	225	SW	15.9	6.57	29.2	32	54	0	21.6	442	0	1019.2	CAL:038	18	15.9	15.9	127	8.05	978.9	999.99	100000
WRCL	06/10/2021 12:33	61233	8.95	6.04	225	SW	15.9	6.57	29.2	32	54	0	21.6	442	0	1019.4	CAL:038	20	15.9	15.9	127	8.95	980.2	999.99	100000
WRCL	06/10/2021 12:34	61234	10.96	8.05	248	WSW	15.9	6.3	29.2	32	53	0	21.6	442	0	1019.4	CAL:039	23	15.9	15.9	127	10.96	981.5	999.99	100000
WRCL	06/10/2021 12:35	61235	10.07	8.05	248	WSW	16	6.39	29.1	32	53	0	21.6	442	0	1019.3	CAL:039	23	16	15.9	127	10.07	982.8	999.99	100000
WRCL	06/10/2021 12:36	61236	10.07	6.04	225	SW	16	6.39	29.1	32	53	0	21.6	442	0	1019.2	CAL:039	22	16	15.9	127	10.07	984.1	999.99	100000
WRCL	06/10/2021 12:37	61237	6.04	2.91	225	SW	16	6.39	29.1	32	53	0	21.6	442	0	1019.2	CAL:039	23	16	15.9	127	6.04	985.4	999.99	100000
WRCL	06/10/2021 12:38	61238	6.93	4.92	248	WSW	16	6.39	29.1	32	53	0	21.6	442	0	1019.3	CAL:039	20	16	16	127	6.93	986.7	999.99	100000
WRCL	06/10/2021 12:39	61239	8.95	6.93	248	WSW	15.9	6.3	29.1	32	53	0	21.6	442	0	1019.1	CAL:039	21	16	15.9	127	8.95	988	999.99	100000
WRCL	06/10/2021 12:40	61240	6.93	4.92	225	SW	15.9	6.3	29.1	32	53	0	21.6	442	0	1019.3	CAL:039	23	15.9	15.9	127	6.93	989.3	999.99	100000
WRCL	06/10/2021 12:41	61241	8.95	6.04	248	WSW	15.9	6.02	29.1	32	52	0	21.6	442	0	1019.2	CAL:040	20	15.9	15.9	127	8.95	990.6	999.99	100000
WRCL	06/10/2021 12:42	61242	8.95	6.04	225	SW	15.9	6.02	29.1	32	52	0	21.6	442	0	1019.2	CAL:040	21	15.9	15.8	127	8.95	991.9	999.99	100000
WRCL	06/10/2021 12:43	61243	10.96	6.93	248	WSW	15.9	6.3	29.1	32	53	0	21.6	442	0	1019.2	CAL:039	21	15.9	15.9	127	10.96	993.2	999.99	100000
WRCL	06/10/2021 12:44	61244	10.07	8.05	270	W	15.9	6.3	29.1	32	53	0	21.6	442	0	1019.2	CAL:039	22	15.9	15.9	127	10.07	994.5	999.99	100000
WRCL	06/10/2021 12:45	61245	10.07	6.93	248	WSW	16	6.39	29.1	32	53	0	21.6	442	0	1019.2	CAL:039	22	16	15.9	127	10.07	995.8	999.99	100000

Appendix C - Photograph Sheet

MONITORING PHOTOGRAPH RECORD **Ref:** BL061021

Site: FCC Bryn Lane MBT **Date:** 06/10/2021

Title: Bryn Lane Phase 2 Env Bioa **Carried Out By:** AH / ET / PM

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

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

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

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

Sensitive Receptor location 3 – Position of the downwind sampler, looking towards the MBT

Sensitive Receptor location 3 – Position of the downwind sampler, looking away from MBT

Appendix D – Laboratory Certificates

SOUTHERN MICROBIOLOGICAL SERVICES LTD

Unit3, Georges Farm, West Buckland, Wellington, Somerset, TA21 9LE
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Email: laboratory@smslab.co.uk Website: www.smslab.co.uk

Enitial
Enterprise Drive
Four Ashes,
Wolverhampton
WV10 7DE

TEST REPORT

Report Reference: 1211000874
Date Reported 11 October 2021
.

Enitial Anderson Plates PO 93417 Site Bryn Lane Phase 2 MBT Client Suez Date Sampled 06.10.21

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*
1211006670	07/10/21	UW001BIOAEM (93.)	---	140	---	560 cfu/m3		
1211006671	07/10/21	UW001BIOAEM (94.)	---	140	---		14 cfu/m3	
1211006672	07/10/21	UW001BIOAEM (VR.)	---	140	---			154 cfu/m3
1211006673	07/10/21	UW001BIOAEM (93.A)	---	140	---	210 cfu/m3		
1211006674	07/10/21	UW001BIOAEM (94.A)	---	140	---		7 cfu/m3	
1211006675	07/10/21	UW001BIOAEM (VR.A)	---	140	---			56 cfu/m3

Enitial Anderson Plates PO 93417 Site Bryn Lane Phase 2 MBT Client Suez Date Sampled 06.10.21

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*
1211006676	07/10/21	UW001BIOAEM (93.B)	---	140	---	336 cfu/m3		
1211006677	07/10/21	UW001BIOAEM (94.B)	---	140	---		77 cfu/m3	
1211006678	07/10/21	UW001BIOAEM (VR.B)	---	140	---			98 cfu/m3
1211006679	07/10/21	UW002BIOAEM (93.)	---	140	---	161 cfu/m3		
1211006680	07/10/21	UW002BIOAEM (94.)	---	140	---		14 cfu/m3	
1211006681	07/10/21	UW002BIOAEM (VR.)	---	140	---			112 cfu/m3
1211006682	07/10/21	UW002BIOAEM (93.A)	---	140	---	266 cfu/m3		
1211006683	07/10/21	UW002BIOAEM (94.A)	---	140	---		< 7 cfu/m3	
1211006684	07/10/21	UW002BIOAEM (VR.A)	---	140	---			56 cfu/m3
1211006685	07/10/21	UW002BIOAEM (93.B)	---	140	---	280 cfu/m3		
1211006686	07/10/21	UW002BIOAEM (94.B)	---	140	---		< 7 cfu/m3	
1211006687	07/10/21	UW002BIOAEM (VR.B)	---	140	---			7 cfu/m3

Enitial Anderson Plates PO 93417 Site Bryn Lane Phase 2 MBT Client Suez Date Sampled 06.10.21

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*
1211006688	07/10/21	UW003BIOAEM (93.)	---	140	---	504 cfu/m3		
1211006689	07/10/21	UW003BIOAEM (94.)	---	140	---		7 cfu/m3	
1211006690	07/10/21	UW003BIOAEM (VR.)	---	140	---			21 cfu/m3
1211006691	07/10/21	UW003BIOAEM (93.A)	---	140	---	133 cfu/m3		
1211006692	07/10/21	UW003BIOAEM (94.A)	---	140	---		< 7 cfu/m3	
1211006693	07/10/21	UW003BIOAEM (VR.A)	---	140	---			63 cfu/m3
1211006694	07/10/21	UW003BIOAEM (93.B)	---	140	---	616 cfu/m3		
1211006695	07/10/21	UW003BIOAEM (94.B)	---	140	---		< 7 cfu/m3	
1211006696	07/10/21	UW003BIOAEM (VR.B)	---	140	---			77 cfu/m3

Enitial Anderson Plates PO 93417 Site Bryn Lane Phase 2 MBT Client Suez Date Sampled 06.10.21

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

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Enitial
Enterprise Drive
Four Ashes,
Wolverhampton
WV10 7DE

TEST REPORT

Report Reference: 1211000875
Date Reported 11 October 2021
.

Enitial Anderson Plates Controls PO 93417 Site Bryn Lane Phase 2 MBT Client Suez Date Sampled 06.10.21

SMS Reference	Date Tested	Sample Code	Sample Details	Ltrs of Air filtered	Further Details 2	*TVC/plate*	*Asp. Fumigatus Plate*	*Gram neg bacteria Pl*
1211006697	07/10/21	ControlBIOAEM (93.C)	---	0	---	< 1 cfu / plate		
1211006698	07/10/21	ControlBIOAEM (94.C)	---	0	---		< 1 cfu / plate	
1211006699	07/10/21	ControlBIOAEM (VR.C)	---	0	---			< 1 cfu / plate
1211006700	07/10/21	FieldBIOAEM (93.F)	---	0	---	< 1 cfu / plate		
1211006701	07/10/21	FieldBIOAEM (94.F)	---	0	---		< 1 cfu / plate	
1211006702	07/10/21	FieldBIOAEM (VR.F)	---	0	---			< 1 cfu / plate

Enitial Anderson Plates Controls PO 93417 Site Bryn Lane Phase 2 MBT Client Suez Date Sampled 06.10.21

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