

SECTION 9

Emissions Monitoring Plan





Emissions Monitoring Plan

NTH SOLUTIONS LLP

NORTH TEES AND HARTLEPOOL

NHS FOUNDATION TRUST

Osmotherley House

Hardwick Road

Stockton-on-Tees

Cleveland

TS19 8PE



North Tees and Hartlepool
NHS Foundation Trust

Issue and Revision Record

Revision	Date	Originator	Description of Changes
V0.1	April 2025	Olive Compliance Ltd	Draft document produced for a new Permit Application

Basis of Plan

This plan has been prepared by Olive Compliance Ltd with all reasonable skill, care and diligence, and taking account of the manpower and resources devoted to it by agreement with the client. Information reported herein is based on the interpretation of data collected and has been accepted in good faith as being accurate and valid.

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REFERENCED DRAWINGS

Drawing 002	Permitted Site Boundary Plan
Drawing 003	Site Layout and Process Plan

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1.0 Introduction

NTH Solutions LLP - North Tees and Hartlepool NHS Foundation Trust has instructed Olive Compliance Limited (OCL) to prepare an application for a Bespoke Environmental Permit Application for their site at Osmotherley House, Hardwick Road, Stockton-on-Tees, Cleveland, TS19 8PE.

The Permit is issued under Regulation 13 of the Environmental Permitting (England and Wales) 2016.

This EMP has been undertaken in accordance with the Environment Agency (EA) *Risk assessments for your environmental permit*¹ (2016) and is a simple assessment of the risks to the environment and human health from noise and fugitive emissions that may be associated with the proposed operations at the site.

The aim of the assessment is to identify any significant risks and demonstrate that the risk of pollution or harm will be acceptable by taking the appropriate measures to manage these risks.

The above guidance requires all receptors that are near the site and could reasonably be affected by the proposed activities to be identified and considered as part of the ERA.

¹ <https://www.gov.uk/guidance/risk-assessments-for-your-environmental-permit>

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1.1 Emissions to Water

The only discharge to the drainage system for surface water is clean and uncontaminated rainwater collected from roofs and clean uncontaminated impermeable surfaced exterior areas of the site. Containment measures in place at the site, will reduce the risk of fugitive emissions being released.

There is no actual discharge from the Sterilwave machine cycle to the foul sewer.

Discharges to foul sewer will be in accordance with a trade effluent consent issued by Northumbrian Water Limited. Discharges include:

- waste compactor runoff
 - waste compactor run-off will be directed to foul sewer.
- vehicle washing
 - Vehicle washing and cleaning will be carried out in accordance with the Environment Agency's Pollution Prevention Guidelines on vehicle washing and cleaning (PPG13). The wash waters will be directed to foul sewer and not to surface or storm drains.
- vehicle oil and fuel leaks
 - Oil and fuel leaks from vehicles will be managed in accordance with Pollution Prevention Guidelines on Use and Design of Oil Separators in Surface Water Drainage Systems (PPG3). An interceptor has been installed in the external yard. Water discharges will flow via the interceptor prior to being discharged to the foul sewer.
- washing of clinical or offensive waste carts
 - Only discharge to foul sewer wash waters from the cleaning of clinical or offensive waste carts. This will meet any limits on effluent constituents in the Consent to Discharge Trade Effluent.
 - Approximately 2500 litres will be discharged over 16 hours per day; this will come from normal wash down activities and the bin washer. It is estimated that the stand-alone bin washer water, approximately 600 litres, will be changed daily with an auto detergent mix being injected as required. The detergents used are industry and environmentally approved.
 - All wastes are stored within carts and bins and stored on impermeable concrete surfacing. Dirty carts and bins are cleaned via the bin washer then 'drip dried' over a grated catchment pit where any excess water and potential run-off is captured. Captured water flows through the internal drainage system, where a screen captures potential solid waste before discharging into the main foul/combined sewer via an interceptor.
- spills and leaks in waste storage areas
 - The contents of clinical waste containers will not enter foul, surface or storm drainage systems. Spilt or leaked materials (including fluids) will be cleaned up and disposed of at a suitably authorised waste management facility.

A trade effluent discharge onsite is permitted in accordance with a discharge consent agreed between the site and Northumbrian Water Limited (**NTH_Consent to the Discharge of Trade Effluent_T1960**). The trade effluent is discharged to the Company's public combined sewer (pipeline reference: NZ42205910) as shown in the site's drainage plan. (**Ref. NTH Solutions LLP 005 Site Drainage Plan**)

Maximum quantity of discharge

The maximum amount of trade effluent to be discharged during any one period of 24 hours shall not exceed 2m³. Please refer to **NTH_Consent to the Discharge of Trade Effluent_T1960**.

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Maximum rate of discharge

The maximum rate of discharge shall not exceed 4 litres per second.

Temperature

No trade effluent shall be discharged with a temperature higher than 43 degrees Celsius.

pH Value

No trade effluent shall be discharged having a pH value of less than 6 or greater than 10.

Any constituents excepting the following not exceeding the concentrations stated below.

Table 1 – Trade Effluent Limits

Constituents	Limit (milligrams per litre)	When expressed as
Total Chemical Oxygen Demand (Dichromate Value)	1,500	O ₂
Suspended solids dried at 105°C	750	-
Non volatile matter extractable by 40/60 petroleum spirit	200	Oil & Grease (O&G)
Nitrogen Ammoniacal	15	as N
Cobalt thiocyanate active substances	100	-
Detergent Anionic	100	-
Sulphide	0.2	-

NTHS records the daily discharge volumes, flow rates, nature and composition of the effluent discharged. The monitoring data is submitted to Northumbrian Water Limited at the end of each quarter.

1.2 Emissions to Air

NTH Solutions LLP have operating procedures to identify, prevent and control potential emissions of pathogens. Refer to NTEES Env 181 SOP (WTP) – Emissions to Air Response and NTEES Env 182 SOP (WTP) – Emissions to Water and or Drainage Response

All staff are required to wear appropriate Personal Protective Equipment to reduce the risk of emissions. Ref. NTEES Env 163 Risk Assessment (WTP) – Use of PPE.

Potential bio-aerosols emissions will be monitored from the treatment process using spore tracers and the procedures available within the EMS. (Ref. NTEES Env 167 SOP (WTP) – Air Emissions Monitoring).

High efficiency particulate air (HEPA) filters are used within each Sterilwave machine/unit discharging point through the ducting pipe before being discharged to atmosphere via a second HEPA filter at discharge point A, in order to prevent bioaerosol emissions from point sources where practicable.

Procedures are in place to allow for the safe removal and disposal of HEPA filters. Refer to NTEES Env 210 SOP (WTP) – Spent Filter Disposal.

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Each Sterilwave machine/unit will macerate and shred clinical waste prior to being rendered safe, using microwave treatment. The design and build of the Sterilwave machines/units has been considered, specifically in relation to ensuring the containment of microbiological aerosols. (Ref. NTEES Env 213 SOP (WTP) – Sterilwave Strip Test).

1.3 Microwave emissions monitoring

NTHS are aware that failures in the containment of the Sterilwave unit, might result in leakage of non-ionising radiation and have operational procedures to check for such leakage at regular intervals. Refer to NTEES Env 190 SOP (WTP) – Leakage of Non-Ionising Radiation Monitoring.

2.0 Site Monitoring

Potential emissions from clinical waste accepted on site may include:

- pathogenic micro-organisms
- chemicals and pharmaceuticals
- body fluids (faeces, urine, blood)

Clinical waste may contain pathogens. Microbial emissions must therefore be minimised and monitored. Examples of emissions may include:

Emissions to air from:

- breached packaging during manual handling procedures
- the treatment process, particularly during shredding of untreated waste
- cleaning and disinfection of mobile rigid containers
- transmission beyond the site boundary by
- infection or contamination of staff or visitors, for example footwear and clothing being taken home by staff
- infection or contamination of, or the removal of infected material by, pests or vermin
- the return of contaminated waste containers to healthcare premises
- by poor loading or packaging causing leakage from or contamination of vehicles

NTHS carry out monitoring to ensure microbial emissions are minimised.

NTHS have operating procedures to identify, prevent and control potential emissions of pathogens. Staff must wear/use Personal Protective Equipment to reduce the risk of emissions. NTHS Standard Operating Procedure (Ref. NTEES Env 203 SOP (WTP) – PPE Usage at the Process Facility) and Risk Assessment (Ref. NTEES Env 163 Risk Assessment (WTP) – Use of PPE).

To prevent bioaerosol emissions from point sources where practicable, the use of high efficiency particulate air (HEPA) filters are installed to each Sterilwave unit discharge point and at the final discharge point (A1).

NTHS effectively maintain HEPA filters to ensure a minimum particle removal efficiency of 99.97% for all particles of 0.3µm diameter as referred to in the Environment Agency How to comply with your

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environmental permit 45 Clinical waste (EPR 5.07 version 1.1). NTHS follow procedure (Ref. NTEES Env 210 SOP (WTP) – Spent Filter Disposal) to safely remove and dispose of spent HEPA filters.

The following tables display examples of monitoring requirements to be confirmed by the Environment Agency.

Table 2
Site Emission Monitoring Plan

Emission Type	Emission Point & Location	Parameter	Limit	Reference period	Frequency	Monitoring Standard or Method
Air	A1	TBC	TBC	TBC	TBC	TBC
Water	NWL Discharge	See Table 1	See Table 1	See Table 1	See Table 1	See Table 1

Table 3
Site Emission to Air Monitoring Plan

Point source emissions to air – emission limits and monitoring requirements						
Emission Point & Location	Source	Parameter	Limit (including unit)	Reference period	Monitoring Frequency	Monitoring Standard or Method
A1 (Point A1 shown on site plan)	Steam ventilation point	Bacillus spores	To be agreed with the Environment Agency	To be agreed with the Environment Agency	Where the introduction of Bacillus spores is required by the Environment Agency to assess emissions from any part of the process	To be agreed with the Environment Agency
	Chemicals	To be agreed with the Environment Agency				

2.1 Monitoring requirements

The following tables are examples of monitoring requirements to be confirmed by the Environment Agency.

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EXAMPLE – Table S3.2 Fugitive bioaerosol emissions monitoring (spiked organisms)

Table S3.2 Fugitive bioaerosol emissions monitoring (spiked organisms)				
Emission point ref. & location	Parameter	Limit (Incl. unit)	Monitoring frequency	Other specifications
Air sample points <10mm from the treatment plant	Bacillus spores	1000 cfu per cubic meter ¹	Annual with the first sampling to be undertaken within 6 months of shredding non-hazardous healthcare waste	In accordance with EA Sector Guidance Note EPR 5.07 Clinical Waste
Air sample points <10mm from the treatment plant	Bacillus spores	300 cfu per cubic meter ¹	Annual with the first sampling to be undertaken within 6 months of shredding non-hazardous healthcare waste	In accordance with EA Sector Guidance Note EPR 5.07 Clinical Waste
Surface sample points <10mm from the treatment plant	Bacillus spores	20000 ² cfu per square meter per hour ¹	Annual with the first sampling to be undertaken within 6 months of shredding non-hazardous healthcare waste	In accordance with EA Sector Guidance Note EPR 5.07 Clinical Waste
Surface sample points <10mm from the treatment plant	Bacillus spores	5000 ² cfu per square meter per hour ¹	Annual with the first sampling to be undertaken within 6 months of shredding non-hazardous healthcare waste	In accordance with EA Sector Guidance Note EPR 5.07 Clinical Waste
Note 1 These units relate to the overall monitoring period so the cfu benchmark applies to: Each individual sample of air taken, with a calculation made to report the result per cubic meter				

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EXAMPLE – Table S3.2 Fugitive bioaerosol emissions monitoring (spiked organisms)

Table S3.2 Fugitive bioaerosol emissions monitoring (spiked organisms)				
Emission point ref. & location	Parameter	Limit (Incl. unit)	Monitoring frequency	Other specifications
For each individual settling plate (this is not an average) – a calculation is made to adjust for surface area of settle plate and exposure time (for example if settle plates are deployed for only fifteen minutes of every hour then the result must be multiplied by four) Note 2 These benchmarks are indicative only, and will be reviewed periodically				

EXAMPLE – Table S3.3 Process monitoring requirements

Table S3.3 Process monitoring requirements				
Emission point reference or source or description of point of measurement	Parameter	Monitoring frequency	Monitoring standard or method	Other specifications
Shredding of waste and subsequent microwave treatment	Routine efficacy monitoring to demonstrate that STAATT Level III criteria for microbial inactivation has been achieved	Fortnightly during the first 6 months of operation. Every two months thereafter	In accordance with guidance in Annexe 2 Sector Guidance Note IPPC EPR 5.07 Additional Guidance for Clinical Waste	

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EXAMPLE - Schedule 4 - Reporting

Parameters, for which reports shall be made, in accordance with conditions of the permit, are listed below.

Table S4.1 Reporting of monitoring data			
Parameter	Emission or monitoring point/reference	Reporting period	Period begins
Bioaerosol monitoring Parameters as required by Condition	Air and surface monitoring points as detailed in Table S3.2	Every 12 months	1 January
Treatment efficacy (routine monitoring) as specified in Table S3.3	Shredding of waste and subsequent treatment by microwaves	Fortnightly then every two months	1 January

Pre-operational measures need to be confirmed by the Environment Agency.

EXAMPLE – Pre-operational measures

Table S1.3 Pre-operational measures	
Reference	Pre-operational measures
1	Routine monitoring procedures where they differ, are effective and have been proven comparable to validation procedures during site commissioning. The operator receives written confirmation from the Environment Agency that the validation report has been agreed. The site must be operated in accordance with the agreed report.

2.2 Site Layout & Plant Drawings

The following images 1-3 provide an understanding of the site processing area layout whilst images 4-5 display the bin wash and treatment process stages.

Image 1 – Site Drainage Plan

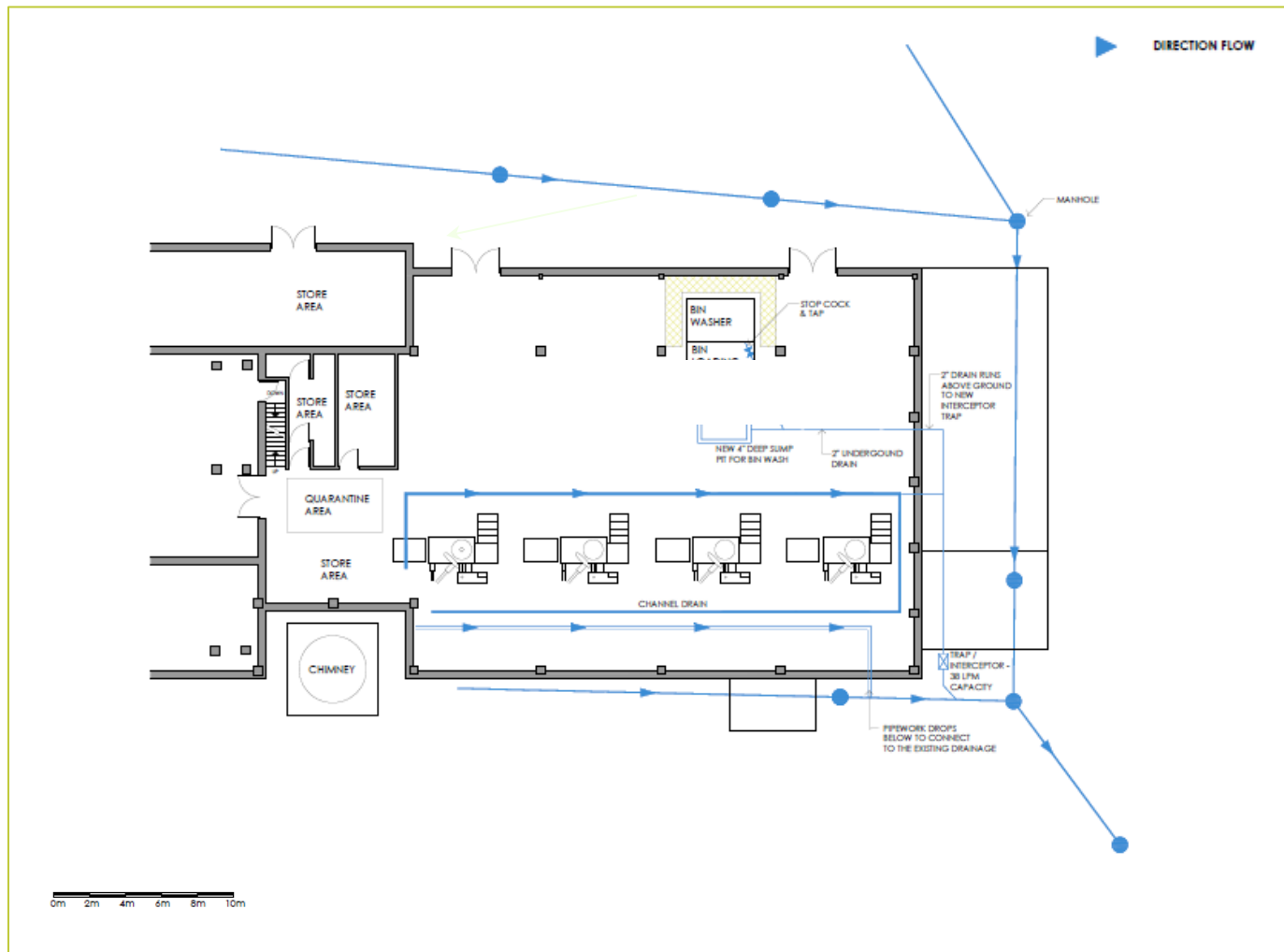


Image 2 – Site Layout and Process Plan

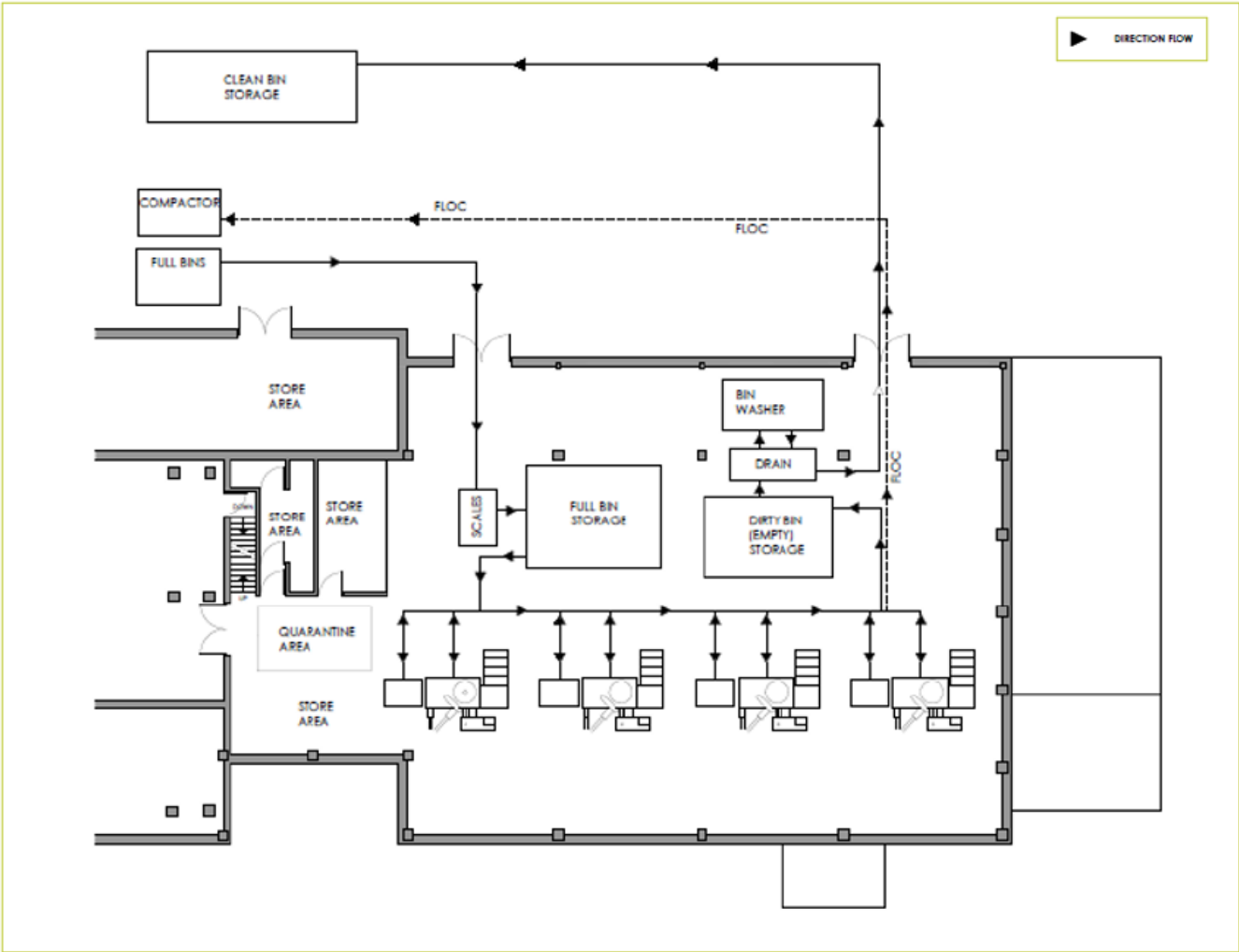


Image 4 – Bin Washer Drawing

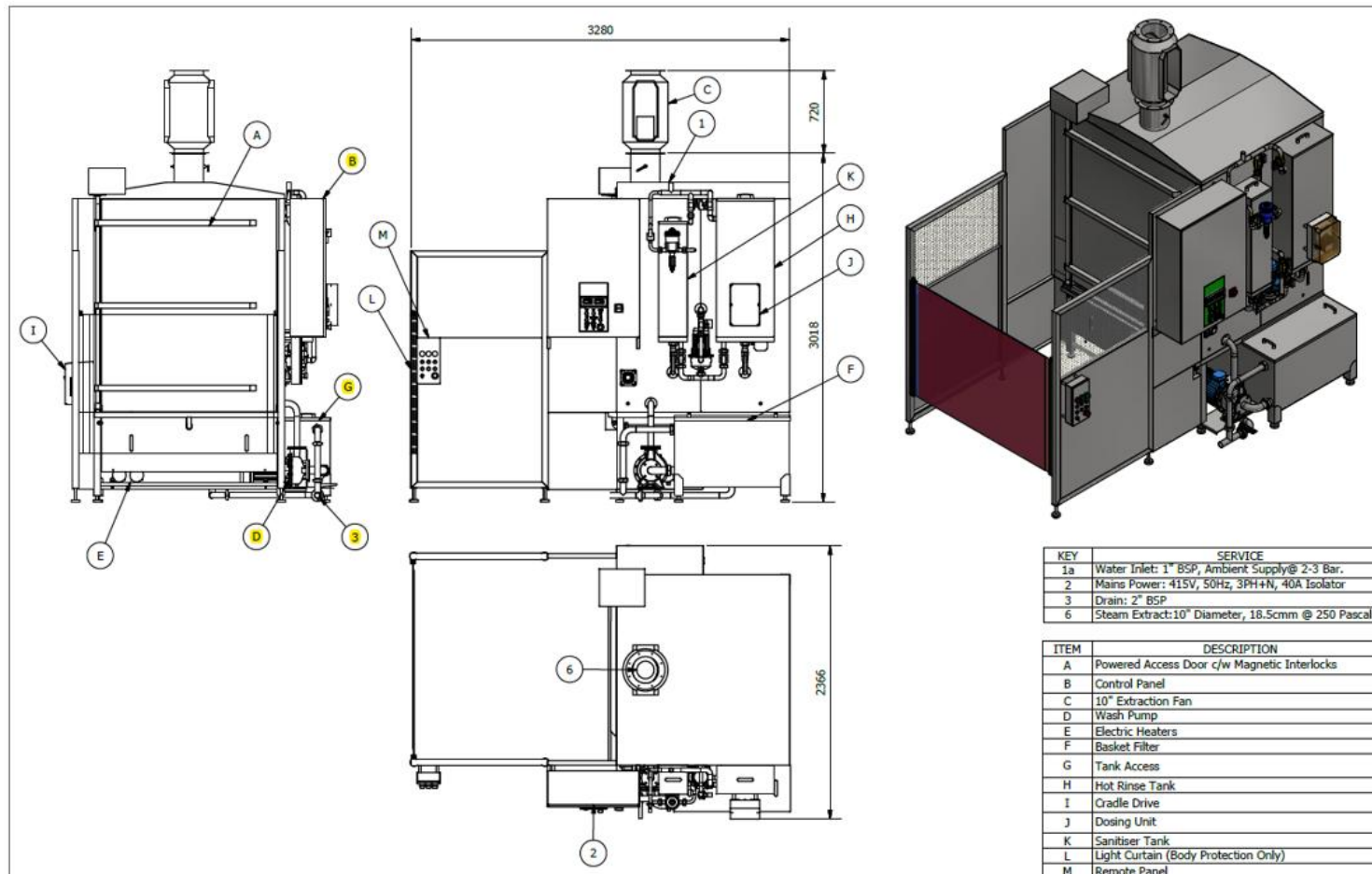


Image 5 – Sterilwave Machine Drawing

