



Environmental Permit Application – Supporting Documentation Appendix B1 - Site Condition & Baseline Report

Sawston Pilot Plant

Immaterial Limited

Unit 3, Cambridge South Business Park, Sawston, Cambridge, CB22 3FG

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Basis of Report

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Appendix B4 - Soil and Groundwater Pollution Risk Assessment.xls



1.0 Introduction

This Site Condition Report (SCR) has been prepared in support of an application for a new bespoke Environmental Permit (EP) for an Installation to operate a Schedule 1 Part 2 Section 4.1 Part A(1) (a) activity 'Producing organic chemicals such as – (vii) organometallic compounds'.

The Operator will be Immaterial Limited, and the site is located at Unit 3, South Cambridge Business Park, Sawston, Cambridge, CB22 3FG (the site).

1.1 Context and Objectives of the Site Condition Report

This Site Condition Report aims to record and describe the condition of the land prior to the commencement of any operations within the proposed EP installation boundary. It has been prepared in accordance with the Environment Agency's (EA) Site Condition Report H5 guidance¹ with regards to the requirements of a baseline report to meet the requirements of Article 22 (2) of the Industrial Emissions Directive (IED)².

This SCR will provide a point of reference and baseline environmental data so that when the EP is surrendered it can be demonstrated that there has been no deterioration in the condition of the land as a result of the Installation operations and ensure that the condition of the land is in a 'satisfactory state'.

The location of the site is illustrated in Appendix A - Figure 1.

The site layout; site boundary and proposed EP boundary and emission points are presented in Appendix A - Figure 2.

The content required by Sections 1 to 3 of the EA's SCR template³ have been included within this document.

1.1.1 Sources

The following sources have been utilised in the preparation of this SCR:

- Multi Agency Geographical Information for the Countryside⁴ (MAGIC) map.
- Landmark Envirocheck Report (reference 342515533_1_1 dated 11 April 2024).
- British Geological Survey⁵.
- EA. Flood map for planning⁶

¹ EA. H5 - Site Condition Report - Guidance and Template. LIT 8001 Version 3.0 April 2013. Microsoft Word - H5 SCR guide for applicants v2 0 4 August 2008.doc (publishing.service.gov.uk).

² Official Journal of the European Union. Directive 2010/75/EU of the European Parliament and of the Council, 24 November 2010 on Industrial Emissions (Integrated Pollution Prevention and Control). L 334/17. Directive 2010/75/EU of the European Parliament and of the Council of 24 November 2010 on industrial emissions (integrated pollution prevention and control) (europa.eu).

³ EA Environmental Permitting Site Condition Report Guidance <https://www.gov.uk/government/publications/environmental-permitting-h5-site-condition-report> accessed January 2024.

⁴ Multi-Agency Geographical Information for the Countryside Map, available at www.magic.defra.gov.uk, accessed in April 2023.

⁵ British Geological Survey, available at <http://www.bgs.ac.uk>, accessed April 2023.

⁶ Flood map for planning, available at <https://flood-map-for-planning.service.gov.uk/>, accessed April 2023



- ECHA: European Chemicals Agency Substance Information⁷.
- Water Framework Directive Environmental Agency Confirmed Hazardous Substances List⁸.

1.1.2 Site Details

Table 1: Site Details

Applicant	
Address	Unit 3, South Cambridge Business Park, Sawston, Cambridge, CB22 3FG.
National Grid Reference	TL 49004 50410
Site Area	Approximately 0.21 hectares
Document Ref for Site Condition Report	405.065240.00001 – Immaterial Ltd - Sawston - SCR dated October 2024.
Figure References See Appendix A of the application supporting documentation	<ul style="list-style-type: none"> • Figure 1 - Site Location Plan. • Figure 2 - Installation Boundary. • Figure 3 – Site Building Internal Layout • Figure 5 – Designated Sites and Habitats Within 2km • Figure 6 – Site Drainage Plan

1.1.3 Site Location

The site is located on the northern outskirts of Sawston, approximately 8 kilometres (km) southeast of Cambridge city centre. Surrounding land use is a mix of residential, agricultural, commercial and light industrial. A development plot is present immediately to the northeast beyond the roadway, light industrial and commercial properties are adjacent to the southeast and northwest and residential properties are located approximately 40m to the southwest.

A site location map is presented in Appendix A – Figure 1.

Immaterial is the leaseholder of the site and as such has no responsibility for any existing pollution within the soil or groundwater underlying the site.

1.1.4 Current on-Site Land Use

The site currently comprises a vacant industrial building to the south, consisting of a warehouse with ancillary office and staff accommodation. The north of the site comprises a hardstanding area for car parking.

No areas of soft landscaping are associated with the site.

⁷ ECHA: European Chemicals Agency Substance Information. Accessed at: Homepage - ECHA (europa.eu). Accessed in October 2023.

⁸ Water Framework Directive Environmental Agency Confirmed Hazardous Substances List. Accessed at '[2018 01 31 Confirmed hazardous substances list_0.pdf \(wfd.uk.org\)](https://www.wfd.uk.org/01_31_Confirmed_hazardous_substances_list_0.pdf)'.



The site was redeveloped between 2018 and 2019 into an industrial / commercial warehouse unit, and is understood to have been occupied by a window manufacturer from 2020 until 2023.

The steel portal frame warehouse building will accommodate the main production area, materials storage and the site offices, with car parking and delivery vehicle access within the hardstanding area to the north. A self-bunded IBC storage container is proposed to be installed adjacent the exterior front wall of the building.

A site layout plan and installation boundary is presented in Appendix A – Figure 2.

The proposed plant layout within the building is shown in Appendix A – Figure 3.

1.1.5 Current Surrounding Land Use

Surrounding land uses are mixed residential, agricultural, commercial and light industrial. A development plot is present immediately to the northeast beyond the roadway, light industrial and commercial properties are adjacent to the southeast and northwest and residential properties are located approximately 40m to the southwest.

1.1.6 Sensitive Land Uses

There are no designated ecological habitats within the proposed installation boundary.

A Nature and Heritage Conservation Screening Report was provided by the Environment Agency as part of the pre-application advice service which identified the following sensitive land designations within 2km of the site:

Table 2: Sensitive Land Designations

Site Name	Designation	Location
Sawston Hall Meadows	Site of Special Scientific Interest (SSSI)	1,223m South
Dernford Fen	Site of Special Scientific Interest (SSSI)	1,548m West
Dernford Farm Grassland	Local Wildlife Sites (LWS)	1,901m West
Magog Down and Stapleford Pit	Local Wildlife Sites (LWS)	1,988m North
Haverhill Disused Railway	Local Wildlife Sites (LWS)	2,000 South East

The location of these sites is shown in Appendix A – Figure 5 within the main application documentation.

There were no sites identified under any of the following designations:

- Special Areas of Conservation (cSAC or SAC);
- Special Protection Area (pSPA or SPA);
- Marine Conservation Zone (MCZ);
- Ramsar;
- National Nature Reserve (NNR);
- Local Nature Reserve (LNR);
- Ancient Woodland;
- Relevant species and habitats.



2.0 Condition of the Land at Permit Issue

2.1 Environmental Setting

2.1.1 Geology

Online BGS (British Geological Survey) published geological data shows the site to be underlain by Alluvium (Clay, Silt, Sand and Gravel) overlying Zig Zag Chalk Formation (Chalk).

Third party site investigations (See Section 6) at the site and wider development area encountered made ground generally 1.0 m thick, comprising mainly soft to firm sandy gravelly clay. Underlying the made ground was Glacial Till comprising soft to very stiff clay with variable gravel content and locally Alluvium. The chalk bedrock was encountered at depths of 1.1 m to 3.7 m below ground level (bgl).

According to BGS datasets the maximum hazard rating identified on site is Moderate relating to collapsible ground stability hazards.

2.1.2 Hydrogeology

Aquifer Classifications

The EA has classified the underlying geology in this area as:

- Alluvium (superficial aquifer) – Secondary A Aquifer.
- Zig Zag Chalk (bedrock)– Principal Aquifer.

Groundwater

The site is located within Zone III (Total Catchment) of a groundwater Source Protection Zone, as designated by the EA. A Zone II and a Zone I source protection zones are located approximately 160 m and 290 m south of the site respectively.

This relates to the abstractions for potable supply located from 450 m south.

Third party site investigations (See Section 6) reported that groundwater was encountered at depths of between 4.3 m and 12 m rising to between 4.1 m and 10 m during the ground investigation and during subsequent monitoring visits at depths of between 1.81 m and 3.26 m bgl.

Groundwater Abstractions

In excess of 6 EA registered groundwater abstractions have been identified within 1 km of the site. The nearest is located 450 m south for west and is for public potable water supply.

2.1.3 Hydrology

Surface Water Features

A surface water drain is located 50 m west of the site which flows in a northerly direction and is partially culverted. A pond is located 300m north. Further surface water drains are located approximately 295m northwest and 380m west which appear to flow into the River Granta

The nearest surface water course is the River Granta located 766m to the north west of the site- this is rated GQA river quality C. this is a tributary of the River Cam

Surface Water Abstractions

The nearest EA-registered surface water abstraction is located 845 m north for spray irrigation.



2.1.4 Flood Risk

The Flood Map for Planning⁹ reveals that the site lies within Flood Zone 1: designated as low probability of flooding from rivers and the sea.

As the site is <1 hectare in size, and in a Zone 1 flood risk area, a flood risk assessment (FRA) would not typically be required.

The Long-Term Flood Risk Assessment¹⁰ indicates that the site is at ‘low risk’ of flooding from surface water. Low risk means that this area has a chance of flooding of between 0.1% and 1% each year. Flooding from surface water is difficult to predict as rainfall location and volume are difficult to forecast. In addition, local features can greatly affect the chance and severity of flooding.

2.2 Pollution History

2.2.1 Historical Land Uses

2.2.1.1 Historical On-Site Land Use

A review of historical maps (Envirocheck Report reference 342515533_1_1 dated 11 April 2024) and other available data sources has been undertaken to prepare the onsite land use history.

Table 3: Historical On-Site Land Use

Description	Dates	Data Source
The site comprised undeveloped agricultural land.	Pre 1886 to Pre 1971	Ordnance Survey mapping
Part of a tile factory encroached on to the north of the site.	Pre 1971 to Pre 1993	Ordnance Survey mapping
The factory was extended. Aerial photography showed container storage being undertaken on the south and centre of the site in 1999.	Pre 1993 to Pre 2013	Ordnance Survey mapping and aerial photography
The site was cleared.	Pre 2013 to Pre 2019	Ordnance Survey mapping and aerial photography
Planning permission (Ref: S/1598/08/F) was granted in December 2008 for the redevelopment of the wider business park, including the site, to provide 27 units for B1(c), B2 and B8 uses and erection of 14 m high wind turbine, the application was resubmitted as S1962/10 in 2010 and subsequently permission was granted in 2014 (S/0969/14/VC) for variation of conditions to the previous planning consent.	2008, 2020 and 2014	South Cambridgeshire District Council online planning portal

⁹ Flood Map for Planning, available at <https://flood-map-for-planning.service.gov.uk/>, accessed in October 2024.

¹⁰ Long Term Flood Risk Assessment – <https://check-long-term-flood-risk.service.gov.uk/> accessed October 2024



Description	Dates	Data Source
Waste pigment sump identified along northern boundary	Pre 2007	MLM Phase 2 Report 2007 (Refer Appendix B3-1)
The site was redeveloped, and the current site layout was constructed by Salmon Development Limited.	2018 - 2019	Ordnance Survey mapping and Bidwells' letting brochure
The warehouse unit was leased to Building product Solutions Limited – for use as a distribution centre for their window manufacturing business	2020 – 2022/23	Online Search

2.2.1.2 Historical Off-Site Land Use

A review of historical maps (Envirocheck Report reference 342515533_1_1 dated 11 April 2024) and other available data sources has been undertaken to prepare the offsite land use history.

Table 4: Historical Off-Site Land Use (within 250m of the site)

Description	Proximity To Site	Dates	Data Source
Tile factory - including: 46,637L kerosene tank approx. 10 m west. 30,000L mould oil tank approx. 15 m northwest. Liquid waste sump approx. 15 m north 3,600L kerosene tank approx. 20m north. Hydrochloric acid store approx. 25m northwest. 3,600L kerosene tank approx. 30m east. 23,118L diesel tank approx. 60m northeast. Then cleared Then redeveloped to light industrial units	On-site and adjacent	Pre 1971 to Pre 2013 Pre 2013 to Pre 2019 Pre 2019 to Present	Ordnance Survey Mapping and MLM Phase 2 Report 2007 (Refer Appendix B3-1)
Gas mitigation measures recommended during 2007 redevelopment works	Immediately adjacent to western site boundary.	2007	MLM Phase 2 Report 2007 (Refer Appendix B3-1)
Residential houses along 'Broadmeadow'	40 m south	Pre 1977 to Present	Ordnance Survey
Refuse tip (slag heap)	65 m west	Pre 1986 to Present	Ordnance Survey mapping



Description	Proximity To Site	Dates	Data Source
Rail lines Then dismantled	100 m northeast	Pre 1886 to Pre 1978 Pre 1978 to Present	Ordnance Survey mapping
Factory	110 m southwest	Pre 1993 to Present	Ordnance Survey mapping
Warehouse	150 m southeast	Pre 1971 to Present	Ordnance Survey mapping
Precast concrete factory Then cleared	190 m east	Pre 1971 to Pre 2024 Pre 2024 to Present	Ordnance Survey mapping

2.2.2 Potentially Polluting Activities – Offsite

Table 5 summarises information on current and historical regulated activities that may have had the potential to cause pollution taken from the Envirocheck Report reference 342515533_1_1 dated 11 April 2024. The information below is restricted to the subject site and a buffer of 500 m from the site boundary. All distances are approximate.

Table 5: Potentially Polluting Land Uses Offsite

Historical Activities	Onsite	Offsite
Historical landfills	N/A	The following information has been obtained in relation to the former refuse tip/slag heap identified on historical mapping 65 m west: Sindall Plant Hire operated a landfill between 1971 and 1991 accepting inert wastes. Prior to this the site was recorded as a Landfill accepting Category 3 Wastes (chemicals).
Historical waste management facilities	N/A	N/A
Current permitted industrial processes	N/A	An Environmental Permit WP3529SL is held by Echion Technologies Limited for manufacture of inorganic chemicals (non-metals e.g. calcium carbide) This is located 50 m northwest of the site. A Local Authority Pollution Prevention and Control (LAPPC) authorisation issued to Hope Construction Materials Limited for the blending, packaging, loading and use of bulk cement is located 305 m southeast of the site.



Historical Activities	Onsite	Offsite
Historical permitted industrial processes	N/A	A Local Authority Pollution Prevention and Control (LAPPC) authorisation issued to Marley Building Materials Ltd for the blending, packaging, loading and use of bulk cement was located 20 m northeast of the site. This permit has been revoked. A Local Authority Pollution Prevention and Control (LAPPC) authorisation issued to Tarmac Limited for the blending, packaging, loading and use of bulk cement was located 376 m southeast of the site. This permit has been revoked.
Historical fuel stations or petrol storage licences	N/A	N/A
Historical licensed radioactive substances	N/A	Three Radioactive Substances Act Licences (RSA's) were historically held by Cambridge Specialist Laboratory Services Limited (341m southeast of the site) These have all been either revoked or cancelled.
Current discharge consents		The closest discharge consent is located 125 m north for sewage discharges to an unnamed ditch
Historical discharge consents	N/A	N/A
Historical pollution incidents	N/A	A minor pollution incident is recorded 75 m east and related to poor operational practices. The incident is recorded as having occurred in 1996.

2.2.3 Recorded Pollution Incidents

A review of historical maps (Envirocheck Report reference 342515533_1_1 dated 11 April 2024) and other available data sources has been undertaken to identify recorded pollution incidents both on and offsite.

2.2.3.1 Onsite Pollution Incidents

There are no onsite pollution incidents recorded.

2.2.3.2 Offsite Pollution Incidents

Table 6 summarises information on recorded pollution incidents that have occurred within 500m of the site.

Table 6: Pollution Incidents Nearby

Statutory Information	Approximate Distance from Site	Description
Pollution Incident to controlled waters	75m southeast	A minor pollution incident (category 3) is recorded in relation to poor operational practice. The incident is recorded as having occurred in 1996.



Statutory Information	Approximate Distance from Site	Description
Substantiated Pollution Incident To Controlled Waters	323m southeast	A Significant pollution incident (Category 2) is recorded in relation to loss of gas and fuel oils The incident is recorded as having occurred in 2002.

2.3 Evidence of Historic Contamination

As the site was completely redeveloped in 2018 / 2019, there is no visible evidence of historic contamination at the site remaining.

SLR has consulted the South Cambridgeshire District Council online planning folder for the site in relation to the redevelopment undertaken in 2018/ 2019 so as to identify whether any assessment or remediation of potential legacy contamination was undertaken.

Review of the documents submitted in support of the planning application identified 4 documents of relevance to the site condition which are presented in Appendix B3 and summarised below:

Table 7: Historical Ground Contamination Assessments

Document Name	Produced by	Document Number and Date	Description	Document Reference in Appendix B3
Phase II Geoenvironmental Assessment Report	MLM Environmental	DMB/721750/R1/F November 2007		B3-1 - MLM Phase 2 Report 2007.pdf
Supplementary Geoenvironmental Assessment Report	MLM Environmental	DMB/721750/R2/F August 2008		B3-2 - MLM phase 2 Supplementary Report 2008
Phase 2 Geoenvironmental Assessment Report	MLM Consulting Engineers Limited	775322-REP-ENV-001-Rev1 5 th October 2017		B3-3 - MLM Phase 2 Report 2017
Remediation Strategy and Verification Plan	MLM Consulting Engineers Limited	775322-REP-ENV-002 29 th September 2017		B3-4 - MLM Overall Redevelopment Site Remediation Strategy and Verification Plan 2017

These reports relate to investigations undertaken as part of the redevelopment of the Marley Building Materials site which comprised a tile factory with associated yards covering the proposed Installation site but also extending to a much wider surrounding area to the north, east and west.

To assist in interpreting these assessments a number of the figures included in these assessment reports have been updated to show the location of the proposed installation



boundary in relation to the overall redevelopment site area. These figures are presented in Appendix B3 – Updated Figures and are as follows:

Table 8: Details of Updated Ground Investigation Figures

Figure Reference Number	Associated Ground Contamination Assessment Report	Purpose of the Figure
Appendix B - Figure B3-1 MLM 2007 - Exploratory Hole Location Plan	MLM - Phase II Geoenvironmental Assessment Report - 2007	Updated Version of Figure 2 from MLM Phase 2 Report 2007 - updated to show the location of the proposed Installation Boundary.
Appendix B - Figure B3-2 - MLM 2007 - Foundation and Gas Mitigation Plan	MLM - Phase II Geoenvironmental Assessment Report - 2007	Updated Version of Figure 5 from MLM Phase 2 Report 2007 - updated to show the location of the proposed Installation Boundary.
Appendix B - Figure B3-3 MLM 2008 - Exploratory Hole Location Plan	MLM - Supplementary Geoenvironmental Assessment Report - 2008	Updated Version of Figure 2 from MLM Phase 2 Supplementary Report 2008 - updated to show the location of the proposed Installation Boundary.
Appendix B - Figure B3-4 MLM 2008 - Hydrocarbon Hot Spot Groundwater and Soil Contamination	MLM - Supplementary Geoenvironmental Assessment Report - 2008	Updated Version of Figure 7 from MLM Phase 2 Supplementary Report 2008 - updated to show the location of the proposed Installation Boundary.
Appendix B - Figure B3-5 MLM 2017 - Exploratory Hole Location Plan	MLM - Phase 2 Geoenvironmental Assessment Report - 2017	Updated Version of Figure 1 from MLM Phase 2 Report 2017 - updated to show the location of the proposed Installation Boundary.

The reports detailed in Table 7 have been reviewed with due consideration of the Installation Boundary so as to identify the sampling locations and data relevant to the condition of the land area within the proposed Installation Boundary. This data is presented in Table 9.



Table 9: Summary of Monitoring Locations Relevant to the Installation

Ground Contamination Assessment Report	Relevant Sampling Locations – Inside the Installation boundary	Relevant Sampling Locations – Outside the Installation boundary	Other Relevant Information
MLM - Phase II Geoenvironmental Assessment Report - 2007	BH1 – located at the southeastern edge of the Installation warehouse building	<p>WS3 – located to the southeast of the eastern corner of the Installation car park area. (adjacent to the former location of the kerosene tank).</p> <p>WS4– located to the west of the northern corner of the Installation car park area.</p>	<p>The following items were identified as having previously been present on the Marley Building Materials Site:</p> <p>A Waste Pigment Sump (Item 6 on Figure B3-1) was located beneath the northeastern end of the car park at the Installation</p> <p>A 46,637 litre kerosene above ground storage tank (Item 7 on Figure B3-1) was previously located near to the northeastern corner of the car park at the Installation</p> <p>Figure B3-2 Shows that ground gas mitigation measures were not required beneath the Installation Boundary</p>



Ground Contamination Assessment Report	Relevant Sampling Locations – Inside the Installation boundary	Relevant Sampling Locations – Outside the Installation boundary	Other Relevant Information
MLM - Supplementary Geoenvironmental Assessment Report - 2008	None	WS 112 – Located to the North of the eastern corner of the Installation car park area WS107 - located to the west of the northern corner of the Installation car park area to the northeast of WS4 WS102 – located to the northwest of the middle of the northwestern perimeter of the Installation WS106 - located to the northwest of the western corner of Installation warehouse building	Figure B3-4 shows that a hot spot of hydrocarbon contamination was identified well outwith the Installation boundary, approximately 25m to the east of the site.
MLM - Phase 2 Geoenvironmental Assessment Report - 2017	WS202 – Located Beneath the Installation car park in very close proximity to the former location of the Waste Pigment Sump.	No additional data	
MLM - Remediation Strategy and Verification Plan - 2017	No additional data	No additional data	Document sets out the proposed overall site remediation and verification strategy – prepared in support of securing planning consent.

Of the sample points assessed in the three assessment reports, only 2 were located within the Installation boundary i.e. BH1 and WS 202 – so these sample points are the only ones that provide site condition data that specifically relates to the land area within the Installation boundary.

The remaining sample points listed in Table 9 are located outside the Installation boundary, but in reasonably close proximity to the perimeter of the site, and hence may provide additional supporting data as to the general site condition around the installation boundary.



The analysis data for these sample points has been summarised into the spreadsheet presented in Appendix B3-5 – Summary Soil and Groundwater Data.xlsx. The detailed Laboratory results are contained within each individual report in Appendix B3.

The data indicates that there are no significant levels of contamination in relation to the land area covered by the proposed installation boundary, although some contamination was identified in the wider surrounding area.

A Remediation Strategy and Verification Plan produced by MLM was submitted to the Local Planning Authority (LPA) in 2017. The report outlined the requirements for remediation and the methodology for undertaking the remediation measures, as well as setting out intentions in relation to the implementation of measures to manage ground gas and hydrocarbon vapour. However, none of the options proposed were required for the land area within the Installation Boundary.

2.4 Evidence of Existing Contamination

There is no current visible evidence of contamination at the site, and the industrial warehouse unit was empty and clean at the commencement of the Immaterial lease on the premises.

However, it must be noted that the land was redeveloped for use as an industrial / warehouse unit in 2018 / 2019 and has only been used as a distribution centre for a window manufacturing company since this time, so the potential for significant contamination to have occurred since the redevelopment of the site is minimal.



3.0 Permitted Activities

3.1 Site Activities to be Permitted

The permit application is for a bespoke Environmental Permit for an Installation to operate a Schedule 1 Part 2 Section 4.1 Part A(1) (a) activity ‘Producing organic chemicals such as – (vii) organometallic compounds’.

Table 10: Scheduled Activities

Activity Reference	Activity Listed in Schedule 1 of the EP Regulations	Description of Specified Activity	Limits of Specified Activity
AR1	Section 4.1 A(1)(a)(vii) - Producing organic chemicals such as- organometallic compounds (for example lead alkyls, Grignard reagents and lithium alkyls);	Producing Organic Chemicals such as: densified metal-organic framework (MOF) materials	From receipt of raw materials to storage and despatch of finished product.

The activities proposed to be undertaken at the production facility will utilise pilot scale production equipment (reactors, blender, tray dryers) in order produce densified metal-organic framework (MOF) materials.

The plant will also be used to undertake and optimise scale up from laboratory scale testing and will also be used to gather Intellectual Property to enable the commercialisation of the proprietary process technologies and products.

The plant is intended to initially produce 6 and 12 tonnes of product per annum, with the potential for increased hours of operation increasing the production capacity up to around 20 tonnes per annum. The materials produced will be sold on for use by third parties for them to use in the development and testing of industrial scale end uses for the materials

The processes to be undertaken at site all involve the reaction of metal salts with organic materials and in some cases metal hydroxides in the presence of a solvent (either an organic solvent, water or other non-volatile solvents depending on the process), and additives to generate densified metal-organic framework (MOF) product materials with subsequent recovery and purification processes. All processing will be on a batch basis with each stage of the process being able to operate independently.

A detailed process description, including details on the raw materials to be used at the site and the storage and containment arrangements is presented in Section 5 of the main technical supporting document submitted as part of the application.

The Installation is still going through the design process and hence there are certain specific details of the site activities that are yet to be finalised. However, the design approach is intended to ensure that the final plant design and associated operational controls (e.g. the Environmental Management System) will be fully compliant with the requirements of Best Available Techniques (BAT) and appropriate Environment Agency guidance in advance of commencement of commissioning and operation of the processes.

3.2 Operation of the Installation and Management System

The Installation will be managed by technically competent personnel in accordance with an Environmental Management System (EMS) and associated operating procedures. This will ensure good practice on site and minimise environmental risk throughout the operation.



4.0 Soil and Groundwater Pollution Risk Assessment

This section presents a soil and groundwater pollution risk assessment in line with the requirements of the Industrial Emissions Directive and the EA guidance on IED Baseline Reporting. This assessment is required to identify whether any Relevant Hazardous Substances are intended to be present in site, and if so to ascertain whether their presence could represent a credible risk of pollution to soil and groundwater, and whether a site condition baseline report is required.

The assessment follows a three-stage approach:

Stage 1 – Identify all potentially hazardous substances on-site;

Stage 2 – Identify those substances that are Relevant Hazardous Substances;

Stage 3 – Assess the site-specific pollution risk from each relevant hazardous substance using a Source -Pathway – Receptor style of assessment taking due consideration of control measures that will be in place to minimise pollution risk.

Where a potential risk to soil and groundwater is identified, then site baseline condition data must be collated and submitted as part of the Permit application and a plan established for monitoring of soil and groundwater monitoring throughout the lifetime of the permit.

4.1 Site Inventory

The types of raw materials used in the process and the indicative maximum inventory and pack size are summarised in Table 11 with a detailed list of all raw materials that may be used at the site presented in Appendix B4.

It is noted that the specific raw materials in use and stored on site will vary depending on the product being produced. Appendix B4 presents a list of all the materials that could credibly be present in site at one time or another, but it is noted that it is unlikely that all of these materials would be present on site simultaneously. The maximum inventories are based upon the maximum storage capacity available on site for each type of material.



Table 11: Raw Materials, Products, Wastes and other Materials Present on Site

Raw Material	Pack Size	Maximum Inventory	Storage Location
<p>Metal Salts Based on the following Metals: Cobalt, Zinc, Nickel, Copper, Magnesium, Zirconium, Iron, Aluminium, Calcium, Silicon, Chromium, Cadmium, Titanium, Niobium, Arsenic,</p> <p>As the following salts: Chloride, Nitrate, Acetate, Acetylacetonate, Carbonate, Oxychloride.</p>	Typically in powdered solid form packed into 25kg Sacks / Bags	4,000 kg	On dedicated storage racking within the building over impermeable concrete hardstanding
<p>Organic Materials</p>	Typically in powdered solid form packed into 25kg Sacks / Bags	6,000 kg	On dedicated storage racking within the building over impermeable concrete hardstanding



Raw Material	Pack Size	Maximum Inventory	Storage Location
Metal Hydroxides	Typically in solution stored in 1,000 litre IBC's, 205 litre drums or smaller carboys	2,000 litres i.e. 2 IBC's	Dedicated IBC / drum storage units with integrated bunding Located within the building
Acids	Typically in powdered solid form packed into 25kg Sacks / Bags	250 kg	On dedicated storage racking within the building over impermeable concrete hardstanding
Solvents (VOC) Ethanol Methanol	Typically in liquid form stored in 1,000 litre IBC's, 205 litre drums or smaller carboys	10,000 Litres of Organic Solvents i.e. 10 IBC's	Dedicated flammable materials IBC storage unit with integrated bunding Located exterior to the building adjacent to the front wall
Non-VOC Solvents	Typically in liquid form stored in 1,000 litre IBC's, 205 litre drums or smaller carboys	As part of the above total solvent inventory	Dedicated IBC / drum storage units with integrated bunding Located within the building
Additives	Either in powdered solid form packed into 25kg Sacks / Bags; or As liquids or in solution typically stored in 25 litre drums or smaller carboys	4,900kg	On dedicated storage racking within the building over impermeable concrete hardstanding Liquids would be stored over appropriate secondary containment
Other Materials			
In addition to the Process Raw Materials, the following substances will also be present on site to support the process and maintenance activities:			



Raw Material	Pack Size	Maximum Inventory	Storage Location
Spare Thermal Fluid for the Reactor Heating package Marlothem HS or similar	Typically stored in 25 litre drums or smaller carboys	50 litres Note larger quantities will be present on site within the heating systems – but these will be sealed systems with control systems to identify potential leaks	On dedicated storage racking within the building over impermeable concrete hardstanding Secondary containment portable bunding will be provided
Spare thermal fluid for the Blender	Typically stored in 25 litre drums or smaller carboys	50 litres Note larger quantities will be present on site within the heating systems – but these will be sealed systems with control systems to identify potential leaks	As above
Spare heating fluid for the Tray dryers	Typically stored in 25 litre drums or smaller carboys	50 litres Note larger quantities will be present on site within the heating systems – but these will be sealed systems with control systems to identify potential leaks	As above
Closed loop cooling system – Spare Glycol	Typically stored in 25 litre drums or smaller carboys	50 litres Note larger quantities will be present on site within the cooling systems – but these will be sealed systems with control systems to identify potential leaks	As above



Raw Material	Pack Size	Maximum Inventory	Storage Location
Spare Ion Exchange Resin / cartridges for the water softening plant	Small bags or boxed cartridges	25kg	On dedicated storage racking within the building over impermeable concrete hardstanding
Compressed Nitrogen (for inertisation of the process headspaces)	Within Cylinders	20 cylinders	Gas cylinder storage compound – exterior to the building
Compressed air	Within Cylinders	4 cylinders	Gas cylinder storage compound – exterior to the building
Deionised or Softened Water (for use as a process solvent and in the Cleaning in Place System)	Typically stored within 1,000 litre IBC's	3,000 litres i.e. 3 IBC's	On dedicated storage racking within the building over impermeable concrete hardstanding
Products			
Work in Progress	In liquid or solid form stored in 1,000 litre IBC's, 205 litre drums or smaller carboys	Up to 4 IBC's i.e. 4,000 litres or equivalent	On dedicated storage racking within the building over impermeable concrete hardstanding
Finished product		Up to 8 pallets	
Wastes			
Dilute Solvent – non recoverable (low percentage of solvent) i.e.g. ethanol in water	Typically in liquid form stored in 1,000 litre IBC's, 205 litre drums or smaller carboys	10,000 Litres of Organic Solvents i.e. 10 IBC's	Dedicated flammable materials IBC storage unit with integrated bunding Located within the building over impermeable concrete hardstanding
Waste Solvent – suitable for recovery (High percentage of solvent) - Primarily Ethanol	Typically in liquid form stored in 1,000 litre IBC's, 205 litre drums or smaller carboys	15,000 Litres of Organic Solvents i.e. 15 IBC's	Dedicated flammable materials IBC storage unit with integrated bunding Located exterior to the building adjacent to the front wall



Raw Material	Pack Size	Maximum Inventory	Storage Location
Other Liquid wastes	TBC – assumed as 205 litre drums or smaller containers	TBC - Small quantities expected to be stored pending removal from site	On dedicated storage racking within the building over impermeable concrete hardstanding Secondary containment portable bunding will be provided
Solid Waste – waste chemicals	TBC – assumed as 205 litre drums or smaller containers	TBC - Small quantities expected to be stored pending removal from site	On dedicated storage racking within the building over impermeable concrete hardstanding
Other solid Wastes e.g. used PPE, spent filters and cartridges etc.	TBC – assumed as 205 litre drums or smaller containers	TBC - Small quantities expected to be stored pending removal from site	On dedicated storage racking within the building over impermeable concrete hardstanding

4.2 Identification of Relevant Hazardous Substances (RHS)

A review of the material categories listed in Table 11 and the detailed list of all materials in Appendix B4 has been undertaken to assess whether the materials are hazardous, and whether they can be considered to be a Relevant Hazardous Substance in relation to having the potential to lead to pollution of soil or groundwater.

Due to the number of substances potentially present on site, these have been grouped by substance types with a precautionary approach being applied to the initial assessment i.e. if any of the materials within each category are considered to be RHS, or where insufficient data was available on the materials listed (e.g. on the ECHA website), it has been assumed for the purposes of the initial pollution risk assessment that the materials within each category have the potential to be RHS.

The findings of this review are summarised in Table 12, with more detail provided in the 'RHS Identification' tab in the spreadsheet presented as Appendix B4.

This initial review has not taken into account the physical form of the materials being used at the site or layers of protection present at the site which could potentially prevent or contain losses, which are considered in Section 4.3. However, the maximum credible loss due to failure of a single primary containment package / container has been noted to provide an indication of the likely scale of loss under a simple loss of containment incident.



Table 12: Identification of Relevant Hazardous Substances

Raw Material Type	Hazardous Substance	Relevant Hazardous Substance	Justification	Maximum Potential Loss from a Single Container
Raw Materials				
Metal Salts	Yes	Yes	<p>Under IED Annex II Metals and their compounds, and Arsenic and its compounds are classified as 'polluting substances to water'</p> <p>Although some of the metal salts will inevitably not pose a significant pollution risk to soil or groundwater, and all will be stored on site in solid form, they have all been considered to be RHS for the purposes of this assessment.</p>	25kg
Organic Materials	Yes	Yes	<p>Most of the organic materials are used in solid form, although some may be present in liquid form e.g. acetic acid.</p> <p>Many are soluble and would be mobile in groundwater</p> <p>Most of them have no environmental hazard risk phrases, although there are 5 substances that do.</p> <p>Many of the substances are readily biodegradable and not bioaccumulating.</p> <p>So, these materials are unlikely to lead to long term pollution risk to soil and groundwater, and the majority could be considered not to be RHS.</p> <p>However, if lost to ground they would put an additional COD load into the receiving groundwater, and so on this basis have been retained in the assessment as potential RHS.</p> <p>However, the package sizes on site and their location within the building significantly limits the pollution risk.</p>	25kg / 25 Litres



Raw Material Type	Hazardous Substance	Relevant Hazardous Substance	Justification	Maximum Potential Loss from a Single Container
Metal Hydroxides	Yes	Yes	<p>The materials used on site will have no environmental hazard risk phrases, and as they are inorganic materials that dissociate fully in water and would not pose a bioaccumulation risk and are unlikely to lead to any significant long-term impacts on groundwater.</p> <p>On this basis they could be considered as not being RHS. However, they will act to alter the pH of soil and groundwater if lost to ground which could impact upon the mobility of other materials in soils etc.</p> <p>So, on this basis they have been retained in the assessment as potential RHS.</p>	1,000 litres
Acids	Yes	Yes	<p>Stored as a solid, but readily soluble in water</p> <p>As per Metal Hydroxides above, plus, potential phosphoric acid to oxidise to phosphate in the environment.</p>	25kg
Solvents (VOC's)	Yes	Yes	<p>The VOC solvents used on site are soluble and would be mobile in groundwater.</p> <p>They have no environmental hazard risk phrases and are readily biodegradable and not bioaccumulating.</p> <p>They are also Volatile Organic Compounds and any loss would be unlikely to all remain in the liquid phase.</p> <p>These materials are unlikely to lead to long term pollution risk to soil and groundwater, and hence could be considered not to be RHS.</p> <p>However, if lost to ground they would put an additional COD load into the receiving groundwater, and at high concentrations there would be an associated toxicity risk, and so on this basis have been retained in the assessment as potential RHS.</p>	1,000 litres
Solvents (Non-VOC's) (excluding Water)	Yes	Yes	<p>The non-VOC solvents are soluble and mobile in groundwater and are readily biodegradable and do not bioaccumulate.</p> <p>However, if lost to ground they would put an additional COD load into the receiving groundwater, and at high concentrations there would be an associated toxicity risk, and so on this basis have been retained in the assessment as potential RHS.</p>	



Raw Material Type	Hazardous Substance	Relevant Hazardous Substance	Justification	Maximum Potential Loss from a Single Container
Additives	Yes	Yes	Present in both solid and liquid form, Varying solubility in water. Some of the additives have aquatic toxicity hazard classifications and some are listed as not being biodegradable and so on this basis have been retained in the assessment as potential RHS. However, the package sizes on site and their location within the building significantly limits the pollution risk.	25kg / 25 litres
Other Materials				
Spare Thermal Heat Fluids	Yes	Yes	Liquids Relatively low solubility Some have H410 risk phrases and are not biodegradable retained in the assessment as potential RHS.	25 litres Note larger quantities will be present on site within the sealed heating systems.
Closed loop cooling system – Spare Glycol	No	No	Liquid form No environmental hazard risk phrases and are readily biodegradable and not bioaccumulating. These materials are unlikely to lead to long term pollution risk to soil and groundwater, and hence are considered not to be RHS.	25 litres
Spare Ion Exchange Resin / cartridges for the water softening plant	No	No	Present in solid form within cartridges etc – not able to be lost to ground.	N/A
Products				
Work in Progress	Yes	Yes	Assumed to be RHS due to potential mix of raw materials, products and other materials used in the process	1,000 litres
Finished product	No	No	No – Present as hydrophobic solids with no environmental hazard risk phrases – no potential to impact on soil or groundwater.	25kg
Wastes				



Raw Material Type	Hazardous Substance	Relevant Hazardous Substance	Justification	Maximum Potential Loss from a Single Container
Solvent Wastes	Yes	Yes	As for Solvents	1,000 litres
Solid Wastes	Yes	Yes	Assumed to be RHS due to potential mix of raw materials, products and other materials used in the process	205 litres 205 kg estimated

4.3 Pollution Risk Assessment

4.3.1 Pollution Sources

The pollution sources relevant to the Soil and Groundwater Pollution Risk Assessment are those Relevant Hazardous Substances identified in Section 4.2.

To simplify the risk assessment these have been grouped according to their physical state and storage location as follows:

- Solid materials stored within the building;
- Small volume containers of liquid materials stored within the building;
- IBC's of liquid materials stored within the building;
- IBC's of liquid materials stored in the flammable materials storage unit outside the building;
- Losses from the production processes within the building.

It is noted that there are no bulk materials storage or pipeline transfer systems outwith the building, or process related drainage systems at the site – these have therefore been discounted from the assessment.

4.3.2 Pathways

The only pathway for any of the materials stored and used at site to impact on potential soil and groundwater would be the direct loss of materials to unsurfaced ground or permeable site surfacing.

4.3.3 Receptors

The defined receptors for this assessment will be the soil and primarily the groundwater underlying the site. Table 13 presents the details of the groundwater underlying the site.

Table 13: Groundwater Receptors

Aspect	Designation	Associated With	Description
Aquifer Designation – Superficial Deposit	Unproductive Strata	Made ground / Alluvium / Lowestoft Formation (glacial)	These are deposits with low permeability that have negligible significance for water supply or river base flow.



Aspect	Designation	Associated With	Description
Aquifer Designation – Bedrock Deposit	Principal Aquifer	Zig Zag Chalk	These are deposits that have high intergranular and/or fracture permeability - meaning they usually provide a high level of water storage. They may support water supply and/or river base flow on a strategic scale. Identified at 1.1m below ground level in BH1.
Groundwater Source Protection Zone	SPZ3	Zig Zag Chalk	Source catchment protection zone. Defined as the area around a source within which all groundwater recharge is presumed to be discharged at the source. A Zone II and Zone I source protection zone are located approximately 160 m and 290 m of the site respectively.

4.3.4 Loss Prevention and Spill Control Measures

4.3.4.1 Storage

All non-flammable raw materials, other materials, products and wastes will be stored within the building.

Dry and powdered materials will be delivered to site by road and will be contained within bags, sacks or other suitable smaller containers. All dry and powdered materials will be stored on suitably robust shelving / pallets within the dedicated storage area inside the building which has an impermeable concrete floor.

Liquids or solutions will also be delivered to site via road vehicle and will be offloaded into the building (via access through the roller shutter doors). Liquids will be stored in IBC's, drums, carboys or other similar smaller portable containers. The maximum capacity of any single container supplied to site will be 1.2m³.

All liquids (including liquid wastes) will be stored over portable bunds or within integrally banded storage cabinets within the dedicated storage area inside the building which has an impermeable concrete floor. There is no floor drainage in this area.

Flammable raw materials i.e. organic solvents (Ethanol / Methanol) will be delivered to site in 1,000 litre IBC's and will be stored in a dedicated secure flammable materials storage unit located outside the front wall of the building. This unit will also be used to store larger volumes of flammable liquid waste e.g. waste solvent.

The siting of this storage unit outside the main building has required Immaterial to submit an application to amend the sites planning permission. Immaterial is still waiting to hear whether this planning consent will be granted. If consent is not granted, then Immaterial will review the options available to relocate the proposed storage inside the building which may require some adjustment to the storage arrangements and layout.

There are no bulk storage tanks at the Installation.

4.3.4.2 Secondary Containment

All liquid raw materials will be stored over appropriately banded areas either in the form of portable bunds, dedicated banded storage cabinets or similar.



All non-flammable liquids will be stored within the building which has an impermeable concrete floor with no floor drains.

The dedicated secure flammable materials storage unit used for the storage of all larger volumes (IBC's) of flammable materials and wastes is constructed with integral bunding.

It is noted that Immaterial is in the process of finalising the location of the flammable materials storage unit (pending planning permission to allow it to be sited outside the building).

Assuming the flammable materials storage unit is located outside the front of the building then the loading and unloading of IBC's will be undertaken outwith the building in an area that currently comprises some concrete and some tarmac hardstanding, with associated surface water (rainwater drains) from these areas (see Appendix A – Figure 6 for the site drainage plan). Immaterial will therefore be reviewing additional options to minimise the risk of loss of material to ground or nearby external surface water drains associated with the storage and handling of bulk flammable materials in IBC's outside the building. This work is currently ongoing and will be reliant on planning consent being granted for the external storage unit. Once the appropriate measures have been identified the details will be communicated to the Environment Agency prior to commencement of operations, and it is requested that this be included as a pre-operational condition in the Permit.

This Site Condition Report has been developed on the assumption that the flammable materials storage unit will be located outside the main building. Should this change, then the SCR will be updated accordingly to reflect any changes.

The main process activities will all be undertaken within the dedicated processing area which will be within an enclosed and walled area within the building. The building concrete flooring and the walls around the process area will act to provide containment for any spills within this area.

All materials stored within the building will also be located over impermeable concrete hardstanding which provides an impermeable barrier to pollution entering soil or groundwater.

The main building floor slab is underlain by a ground gas and organic vapour protection system. This system is a 'low energy blanket' which comprises:

- a geocomposite membrane which is fully sealed and welded and acts as both a ground gas barrier and an impermeable damp proof membrane; and
- A positive pressure unit (air blower), delivery manifolds and associated gas diffuser network installed beneath the membrane.

The system operates by delivering a supply of clean fresh air and diffusing it below the floor construction to disperse any accumulated gas.

4.3.4.3 Management Controls

In addition to the physical containment systems proposed at the site, the site activities will also be managed subject to an Environmental Management System which will incorporate procedures which will include consideration of receipt of deliveries, moving and handling materials, management of storage areas, spill response, incident response, and logging and follow up of incidents etc.

The site management systems will also set out the requirements for inspection and maintenance of site systems and infrastructure to ensure that they remain in good working order and fit for purpose.



These management controls will be subject to periodic audit and update.

All site staff will receive appropriate training on the application of the procedural controls, and in particular the appropriate actions to take with regard to identifying and dealing with spillages or leaks should they occur.

All storage areas will also be subject to scheduled visual housekeeping checks and inspections to ensure that there are no leaks or losses from primary containment.

Any spillages of dry or powdered materials will be cleaned up at point of spillage using dry techniques e.g. brush and dustpan.

Any spillages of liquids or solutions will be cleaned up at point of spillage using adsorbents, spill kits and other suitable clean up measures.

4.3.5 Findings of the Soil and Groundwater Pollution Risk Assessment

The findings of the soil and groundwater pollution risk assessment are presented in the spreadsheet in Appendix B4.

The assessment has concluded that whilst the site will store and use relevant hazardous substances, then vast majority of these will solely be present within the site building and the risk of pollution from the following sources, when taking into account the layers of protection that will be in place on site, is considered to be extremely low and therefore not a credible potential source of pollution:

- Solid materials stored within the building;
- Small volume containers of liquid materials stored within the building;
- IBC's of liquid materials stored within the building;
- Losses from the production processes within the building.

However, the following source may present a low to medium risk of pollution occurring in the event of spillage whilst loading or loading IBC's into the storage unit, or onto road vehicles:

- IBC's of liquid materials stored in the flammable materials storage unit outside the building.

Although it is noted that the risk of loss when the IBC's are in the storage unit is reduced to extremely low levels, the pollution risk is solely associated with the activity of loading and unloading IBC's from road vehicles.

The materials handled in this location are ethanol, and potentially methanol, and it is noted that the maximum credible volume of loss from any single uncontrolled loss incident would be 1,000 litres i.e. the full contents of an IBC.

Such incidents would not go unnoticed as operators would be present during such activities and actions would be taken to minimise and control the loss e.g. placing the IBC into the bunded storage unit to contain the loss and cleaning up any local spillage using spill kits etc. Subsequent incident investigation would then review whether there is any requirement for site investigation and if required material recovery / remediation.

Both ethanol and methanol were identified as potential Relevant Hazardous Substances in Section 4.2 as a result of potential COD and short-term toxicity risk on receiving groundwater. However, these pollutants are both volatile organic compounds, and whilst highly soluble in water they do not have any environmental hazard statement classifications (H4**) for aquatic toxicity, both are readily biodegradable and do not bioaccumulate, so the potential for small losses (<1,000 litres) of either of these materials to lead to long term soil or groundwater impacts is considered to be limited.





5.0 Baseline Soil and Groundwater Reference Data

The baseline soil and groundwater data for the Environmental Permit is contained within the reports listed in Table 2-5 and included in Appendix B3 specifically in Appendix B3-5 – Summary Soil and Groundwater Data.xlsx. This data is based on the information made available to Immaterial from the Landlord.

The soil and groundwater data within these reports that specifically relates to the site condition within the installation boundary is the data from 2017 for sample locations BH1 and WS202, it is this data that is considered to represent the baseline soil and groundwater data for the Environmental Permit.

The soil and groundwater data within these reports from sample locations WS3, WS4, WS107, WS112 and WS202 provide additional supporting data as to the general site condition around the installation boundary.

It is noted that the analysis undertaken in these reports covers a wide range of determinands, and that many of these are not relevant to the nature of the relevant hazardous substances held and used on site and their associated pollution risk as assessed in Section 4. However, given the sites legacy of industrial operation it has been considered prudent to provide a wide set of baseline data at this time to provide clear demarcation between legacy pollution and the site condition during the lifetime of the Environmental Permit.

It is noted that the review of site condition for permit surrender will solely focus on those relevant hazardous substances stored and used as part of the Installation activities regulated under the Environmental Permit and that have been identified a posing a credible risk of pollution by the Environmental Risk Assessment presented in Section 4.5.

The current site baseline data proposed does not include specific analytical data for ethanol and methanol which are the primary Relevant Hazardous Substances which are considered to pose a potential risk to underlying soil and groundwater from the site. However, based upon the site's history (Section 2.2) and the proposed installation baseline data, there is nothing to suggest that either of these substances would have been used historically at the site or would be present in underlying soil or groundwater. It is proposed that this be confirmed through the first set of soil and groundwater monitoring undertaken as part of the periodic lifetime assessment of site condition (See Section 6.2).



6.0 Proposed Monitoring During the Lifetime of the Permit

6.1 Recording Loss of Containment Incidents

As part of the EMS, the site will maintain an incident log to record any incidences of spillage outside the building, and provide details what was lost, where it was lost to, and how the loss was contained and cleaned up along with any other details of relevance. This record of loss of containment incidents will be retained throughout the permit lifetime.

6.2 Infrastructure Monitoring

As part of the site EMS and associated sitewide inspection and maintenance systems, an infrastructure monitoring programme will be developed and implemented on site which will be used to ensure that all environmentally critical infrastructure used to prevent or control losses to soil or groundwater are maintained in good working condition and fit for purpose. This will include:

- Site housekeeping measures and periodic site walkover routines to check for potential spillage / losses;
- Periodic inspections to confirm the integrity of all primary containment measures e.g. IBC's, drums, carboys, sacks etc.;
- Periodic inspections to confirm the integrity of all secondary containment measures e.g. IBC storage units, banded pallets etc.

This infrastructure monitoring programme will be in place prior to commencement of operation of the installation, with records being retained throughout their lifetime of the permit.

6.3 Soil and Groundwater Monitoring

IED requires that periodic monitoring of soil and groundwater be undertaken where a credible pollution risk has been identified.

Immaterial is the leaseholder of the site and as such has no responsibility for any existing pollution within the soil or groundwater underlying the site, and the lease specifically prohibits any penetration through the floor slab.

The main building floor slab is underlain by a ground gas and organic vapour protection system. This system is a 'low energy blanket' which comprises:

- a geocomposite membrane which is fully sealed and welded and acts as both a ground gas barrier and an impermeable damp proof membrane; and
- A positive pressure unit (air blower), delivery manifolds and associated gas diffuser network installed beneath the membrane.

The system operates by delivering a supply of clean fresh air and diffusing it below the floor construction to disperse any accumulated gas.

The presence of this ground gas and organic vapour protection system prevents any drilling through the floor slab, as any damage to the geocomposite membrane would impact on the performance of the ground gas and organic vapour protection system. This prevents the installation of any soil or groundwater sampling wells or trial pits within the site area covered by the building.



The findings of the soil and groundwater pollution risk assessment presented in Section 4.3.5 have identified that where the proposed site activities are undertaken within the site building there is an extremely low pollution risk and therefore these are not considered to present a credible potential source of pollution.

So, for the area of the Installation covered by the main building, no collation of additional baseline data or periodic soil and groundwater monitoring throughout the lifetime of the Environmental Permit is proposed.

However, the findings of the soil and groundwater pollution risk assessment presented in Section 4.3.5 have identified a low to medium risk of pollution occurring outside the building in the event of spillage whilst loading or loading IBC's into the external storage unit, or onto road vehicles.

It is noted that the final location of the flammable materials storage unit is yet to be determined and is dependent on whether planning permission will be granted to allow the storage unit to be located outside. Immaterial is also still in the process of identifying additional options that will be used to minimise the risk of loss of material to ground or surface water drains associated with the storage and handling of bulk flammable materials in IBC's outside the building. These additional measures have not been fully progressed at the time of preparation of this application as the need for them will be dependent on whether the IBC storage unit will be permitted to be located outside the building.

Should the final design arrangements alter the site pollution risk profile, or the need for periodising site condition assessment, then this will be advised to the Environment Agency accordingly.

IED requires that periodic monitoring of soil and groundwater be undertaken where a credible pollution risk has been identified.

Hence, on the basis of the information presented in the current soil and groundwater pollution risk assessment Immaterial will be required to undertake periodic monitoring of soil and groundwater in the areas outside the building used for loading and unloading of IBC's as follows:

- Groundwater monitoring – every 5 years;
- Soil monitoring – every 10 years.

Immaterial proposes that the specific details of the proposed monitoring programme be confirmed and agreed with the Environment Agency within 6 months of commencement of operation of the installation, but it is initially anticipated that monitoring will be solely targeted at the area used for loading and unloading solvent IBC's outside the building, and that analysis will solely focus on ethanol and methanol recorded as Total VOC's.

All sampling and analysis will be undertaken in accordance with the requirements of the relevant EA guidance.

Immaterial is also proposing to try to undertake some additional soil and groundwater sampling outside the building prior to commencement of operations to supplement the existing baseline data and specifically to collate additional baseline data on Ethanol, Methanol and VOC levels within the underlying ground. The findings of this assessment will be provided to the Environment Agency once completed.





Appendix B2 – Landmark Envirocheck Report

**Environmental Permit Application – Supporting
Documentation Appendix B1 - Site Condition & Baseline
Report**

Sawston Pilot Plant

Immaterial Limited

SLR Project No.: 410.065240.00001

5 December 2024



Appendix B3 – Historical Phase 2 Assessment Reports

**Environmental Permit Application – Supporting
Documentation Appendix B1 - Site Condition & Baseline
Report**

Sawston Pilot Plant

Immaterial Limited

SLR Project No.: 410.065240.00001

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B3-1 MLM Phase 2 Report 2007

B3-2 MLM Phase 2 Supplementary Report 2008

B3-3 MLM Phase 2 Report 2017

**B3-4 MLM Overall Site Redevelopment – Site Remediation Strategy
and Verification Plan 2017**

B3-5 Summary Soil and Groundwater Data – Excel Spreadsheet

B3-6 Updated Figures

**Figure B3-1 - MLM 2007 - Exploratory Hole Location Plan and Location
of Historical Potential Sources of Contamination**

Figure B3-2 - MLM 2007 - Foundation and Gas Mitigation Plan

Figure B3-3 - MLM 2008 - Exploratory Hole Location Plan

Figure B3-4 - MLM 2008 - Hydrocarbon Hot Spot Location

Figure B3-5 - MLM 2017 - Exploratory Hole Location Plan





Appendix B4 - Soil and Groundwater Pollution Risk Assessment

**Environmental Permit Application – Supporting
Documentation Appendix B1 - Site Condition & Baseline
Report**

Sawston Pilot Plant

Immaterial Limited

SLR Project No.: 410.065240.00001

5 December 2024

Appendix B4 - Soil and Groundwater Pollution Risk Assessment.xls





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