Knauf Insulation Limited

KNAUF SHOTTON ENVIRONMENTAL PERMIT APPLICATION

Dust Emissions Management Plan



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WSP

8 First Street
Manchester
M15 4RP

Phone: +44 161 200 5000

WSP.com

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Prepared by	Claudia Lee	Claudia Lee	Claudia Lee
Signature	03/08/2025	06/08/2025	
Checked by	Matt Derbyshire	Matt Derbyshire	James Killick
Signature	03/08/2025	06/08/2025	
Authorised by	Stuart Clayton	Stuart Clayton	Stuart Clayton
Signature			
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1 INTRODUCTION

A new rock mineral wool (RMW) insulation manufacturing factory, hereafter referred to as “the Site”, with associated storage is to be developed by Knauf Insulation Ltd (hereinafter ‘Knauf’) adjacent to Shotton Steelworks at Shotton, Flintshire in Wales.

Operations at this Site will produce a RMW insulation product, for various applications. Site operations will be continuous and operate 24 hours per day. The Site has the potential to release fugitive emissions of dust, due to the nature of the processes undertaken and products formulated.

Activities that could be sources of dust emissions include:

- Material unloading in the material reception area;
- Batch preparation;
- Stone melting process;
- Formation of the stonewool;
- Cutting of stonewool;
- Recycling processes (including scrap, filter dusts or trims); and
- General vehicle movement across the site.

However, as outlined in sections below, the design of the site has considered and incorporated many of the dust generating processes, and potential source of fugitive emissions, within the internal buildings. This is in addition to other methods of abatement have been considered and embedded into the proposed operations, these are discussed below.

The site will also be subject to the requirements of an Environmental Permit. This will limit and require demonstrated management for all point source and fugitive emission to air.

As the site is in the design and development stage, various environmental consents and permits are being addressed and applied for via the Regulator, in this instance through Natural Resources Wales (NRW).

This Dust Emissions Management Plan (DEMP) has been created to support the bespoke environmental permit application and forms part of the site’s overall Environmental Management System (EMS).

The DEMP will identify the processes at the facility that could pose a risk of fugitive emissions, alongside the abatement measures that are proposed to combat such risks and prevent harm to the local environmental receptors.

The location of the site is within Flintshire County Council’s geographical boundary.

The site is not within an Air Quality Management Area (AQMA).

1.1 OPERATIONAL SUMMARY

The production of RMW insulation, involves raw materials and recycled waste materials being combined and melted, in varying ratios (dependent on the required outcome), prior to being spun into mineral fibres, using a spinner. A binder is then added to the fibres, forming a fleece and the fleece is then cured.

Once cooled, further processing is carried out to tailor the product to customer requirements. The facility comprises a raw material reception, materials processing, product formation and curing, product fabrication and packaging, and abatement plant processes.

1.2 OBJECTIVE

The primary objective of the DEMP is to provide detail of the proposed management arrangements, controls, and abatement to ensure dust emissions are well managed and do not have an impact beyond the site boundary.

This DEMP has been developed in line with Natural Resource Wales, Environmental Permit Guidance and incorporates the key principles from the following guidance:

- Gov.uk guidance 'Control and monitor emissions for your environmental permit[1]

This document is to be used along with the main Technical Support Document and Environmental Risk Assessment (ERA), which is included in Appendix 9 of the Environmental Permit Application.

The ERA aims to:

a. Identify potential risks that the proposed activities may present to the environment;
b. Screen out those that are insignificant and do not require detailed assessment;
c. Identify potentially significant risk, where appropriate;
d. Choose the right control measures, where appropriate; and
e. Report the findings of the assessment.

The ERA has been developed to consider the requirements of the Natural Resource Wales web guidance How To Carry Out A Risk Assessment For An Environmental Permit.

[1] https://www.gov.uk/guidance/control-and-monitor-emissions-for-your-environmental-permit

2 ACTIVITIES

2.1 MATERIAL DELIVERIES

Deliveries of raw materials are made to the site in bulk trucks (e.g. Heavy Goods Vehicles (HGVs)) which are fully laden (as permitted by vehicle size) carrying maximum permitted quantities of material at a time. Access to the site is via the public highway and private road, which is also associated with Tata Steel. The roads are all paved and will minimise and avoid the generation of dust and/or mud.

Basalt and slag, raw materials, are unloaded and stored inside of the raw materials building in large, dedicated storage bays. Tipping and unloading will be undertaken in a controlled and supervised operation to minimise dust generation.

RMW waste products are also delivered by HGVs that have an estimated load of 6 tonnes per truck, these are also unloaded and milled within an enclosed building.

Records of deliveries are logged, and records of waste material are retained by the site for two years, as per the duty of care requirements. Waste deliveries are subject to waste acceptance checks to identify unsuitable waste materials. Table 1 below details the material deliveries to Knauf Shotton.

Table 1 - Typical solid raw materials and solid waste types brought to Knauf Shotton

Waste Code (EWC)	Product Description	Tonnes / Week	Destination within facility	Main Building	Water Treatment	Detail
10 09 03 / 10 10 03	BF Slag, Solid	910	Storage	Use	N/A	Raw Material in production process
10 09 03 / 10 10 03	EAF Slag, Solid	140	Storage	Use	N/A	Raw Material in production process
n/a	Internal RMW, Solid	660	Storage	Use	N/A	Raw Material in production process
17 06 04	Queensferry RMW, Solid	210	Storage	Use	N/A	Raw Material in production process
17 06 04	Imported waste RMW (Dunite), Solid	70	Storage	Use	N/A	Raw Material in production process
n/a	Basalt, Solid	770	Storage	Use	N/A	Raw Material in production process
n/a	[redacted]	<60		Storage & Use	N/A	Binder material used within production process
n/a	Calcium Hydroxide	21		Storage & Use	N/A	Binder material used within production process
n/a	Sodium Chloride	<35			Storage & Use	Chemical used within water treatment

2.2 OVERVIEW OF PROCESSES

The site layout is shown below in Figure 1, with the boundary outlined in red. Other key areas are detailed, including the loading and storage areas.

HGVs/vehicles arrive in the north of the site and proceed to the HGV parking bays, where they are directed to the raw materials building along paved, asphalt internal site roads.

Raw materials are unloaded into the raw materials building which is enclosed except for a large opening on the southern elevation to minimise fugitive emissions of dust.

Alternatively, deliveries of binder materials are made to the main process building via the internal site roads. As described below, materials flow through the building where they are manufactured before the finished product is stored prior to dispatch.

Figure 1 - Site Layout



The SAF melter, spinner, collecting drum, pendulum and curing oven for the formation and curing are all located in the main site building. Cutting and grinding equipment on the fabrication line can also be found in the main building. Fixed plant inside of the raw materials building includes a rod mill for grinding wastes.

An area of concrete hardstanding will be provided to the south-east of the site for storage the finished product which will be palletised.

The site layout, shown in Figure 1, provides context to the flow chart of operations, which is also provided below in Figure 2.

The general flow of operations is designed for continuous operations, with materials passing from west to east through the manufacturing facility, from the receipt of raw material to packaging of final products. This avoids double handling of raw materials and finished products which reduces disturbances of wastes.

The raw material building is enclosed and covered to prevent wind scouring of stockpiled materials and wastes. Materials are transferred to the batch house area for melting in the SAF melter.

The batch house area is located comprises a number of silos, conveyors and structures. To minimise fugitive emissions of dust milled RMW and raw materials are stored in silos, ready to be mixed within the day bins before being processed by the SAF melter (yellow processes on Figure 2).

Material storage in silos prevents the risk of further dust emissions to the environment. Silos are to be fitted with dust filters, as additional measures to control fugitive emissions.

Mixed batches will be mechanically transported to the SAF melter (pink processes on Figure 2). The melter exhaust captures the gases generated in the melting process and is backed up by the melter emergency stack in the event of equipment failure.

Stonewool formation and curing of the melt occurs next. After the liquid melt has been poured continuously over a set of rotating wheels (the spinner) to form mineral fibres, a binder will be sprayed over the formed fibres whilst being sprayed into the rotating drum, via the use of a fan. Fibres can then be collected onto a conveyor in the form of a primary fleece. A perpendicular conveyor will be used to distribute primary fleece into a secondary fleece. Conveyor speeds, level of crimper compression and height within the oven dictates the properties of the final product that is to emerge.

Curing is the final step, where the binder sets to bond the fibres together, creating the finished product from the secondary fleece (green processes on Figure 2). Exhaust gases are removed from each of the collection drums, the curing oven and cooling zone.

Customer requirements of the product will be processed in the fabrication line, following which the cutting, packaging and labelling can be undertaken (blue processes on Figure 2).

2.3 OVERVIEW OF DUST AND EMISSION CONTROLS

At various stages throughout the process, dust and emissions abatement methods will be implemented and de-dusting extraction systems employed to prevent pollution of the surrounding environment and harm to any nearby receptors. Further details in relation to dust abatement measures are discussed in later sections of this plan.

At specific points through the process, the collection of wastes/refuses will be carried out, to include scrap products, filter dusts or trims.

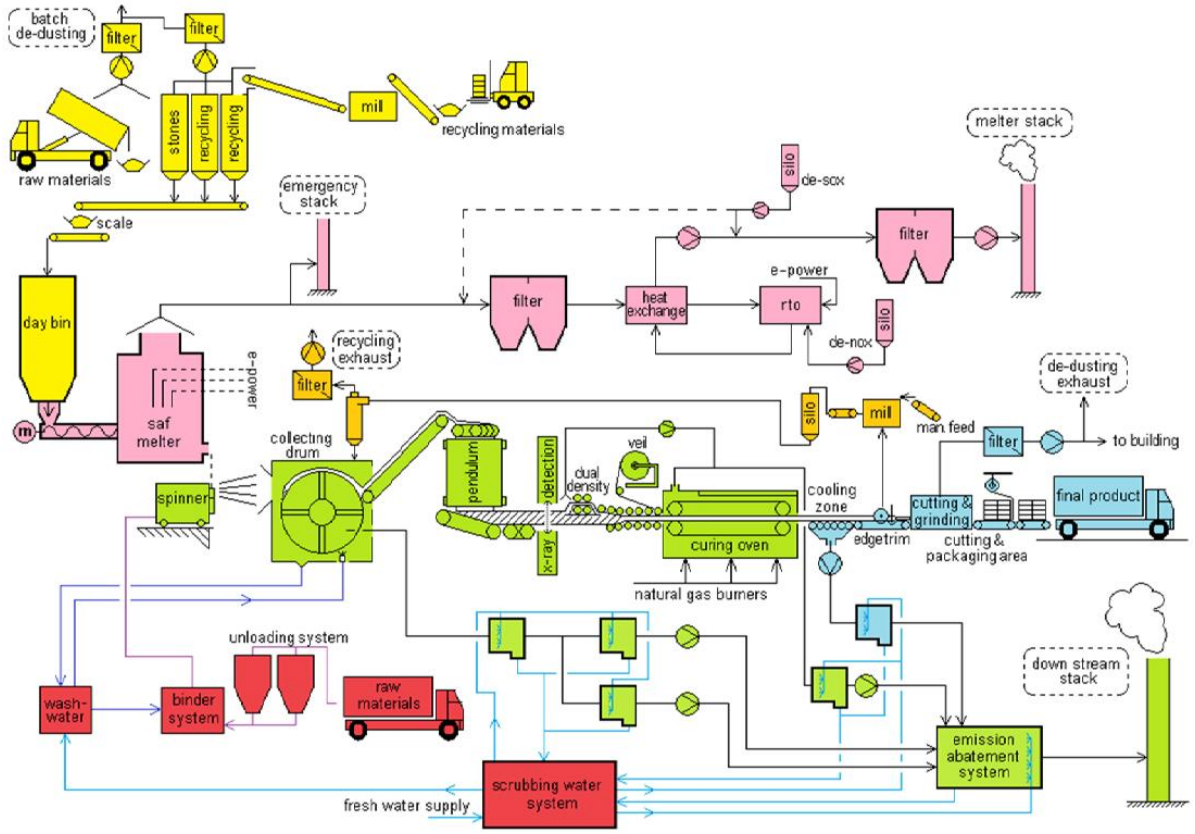
The dust generated during the cutting processes is extracted with a de-dusting system. De-dusting air is filtered to avoid creating a pathway to the external environment.

During winter times, air from the de-dusting system is returned to the main building to avoid extraction of warm air. During warmer periods, filtered de-dusting air is emitted to the external environment.

Certain streams of waste will be recycled throughout the process (orange processes on Figure 2), with some either being added back to the drum or others recycled in the melting process. To support this main manufacturing process, side processes are required, for binder production, equipment cooling water loop, compressed air production, and continuous equipment cleaning system (red processes on Figure 2).

The main site building is fully enclosed with goods dispatched from loading bays on the eastern side. All doors are kept closed when not in use to prevent dust escaping from the building.

Figure 2 - Process Flow Diagram



2.4 MOBILE PLANT AND EQUIPMENT

The site uses a number of mobile plant equipment that utilise battery or electrical power and therefore do not generate any particulate emissions.

Nitrogen Dioxide gas is a by-product of internal combustion engines and the site uses several items of plant with internal combustion engines

Table 2 below details the mobile plant and equipment used on site; where this information is available, and will be updated as mobile equipment is purchased:

Table 2 - Mobile Plant and Equipment Details

Description	Make	Model	Emission Rating
Front End Loader	Tbc	Tbc	Tbc
Shunt Trucks	Tbc	Tbc	Tbc
Emergency Generator	Tbc	Tbc	tbc

All mobile plant and equipment, both diesel powered or electrically powered are owned by Knauf and are maintained in line with original equipment manufacturer recommendations. Mobile plant fleet replacement is assessed on a case-by-case basis but aims to reduce emissions to air and carbon emissions by replacing diesel with bio-diesel or electrically powered equipment.

The site rules include a mandatory site speed limit and use of anti-idling technology and campaigns to minimise emissions during period when plant is not in use.

3 RECEPTORS

3.1 SENSITIVE RECEPTORS

The majority of the site comprises previously developed land laid to grass and low-lying vegetation. Former buildings and compounds that were located on the site mean that the location is industrial in nature.

In regard to the surrounding area, the nearest residential receptors are nearly 1,300 metres to the south and southeast (from the site centre point), in the form of houses on Bridge Street and Salisbury Street. The following receptors are within 1,000 metres of the site:

- Users of Hawarden Bridge train station, which is located south-east of the site, although receptors are not likely to be present for extended periods of time at this location;
- Businesses and industrial buildings at Tata Steel located to the west;
- Facilities at Toyota Motor Manufacturing located to the north;
- Businesses and industrial buildings at Deeside Industrial Estate to the east; and
- Visitors of Dee Park, located to the southwest of the site.

There are examples of sensitive receptors (where occupants are more susceptible to the adverse effects of exposure to high levels of dust and particulates such as healthcare or educational facilities) although none are within 1,000 m of the site, examples of such sensitive receptors comprise:

- Little Stars (Deeside) Ltd, which is approximately 1,150 m west of the site;
- Sealand Primary School, which is approximately 1,150 m southeast of the site;
- Ysgol Cae'r Nant School, which is approximately 1,770 m southwest of the site;
- Queensferry CP School, which is approximately 1,900 m south of the site; and
- Deeside Community Hospital, which is approximately 2,440 m south of the site.

The RMW insulation manufacturing factory has the potential to cause amenity impacts of dust, which should also be considered in the development of mitigation measures for fugitive dust emissions.

Within a 1km buffer zone of the site there are various receptors that are classed as the 'clean industry', which encompass powder coaters, paint shops, offices, diesel generators, busy roads, power stations, food manufacturers, food outlets, agricultural land, solar panel sites, air conditioning systems and car parking areas. All of these involve activities that need to be accounted for when understanding the risks posed by potential fugitive dust emissions from this facility. Within the 1km region, the following receptors have been identified:

- Tata Steel UK Ltd, which is approximately 120 m southwest of the site;
- Toyota Deeside Solar Park, which is approximately 175 m to the northeast of the site; and
- Toyota Motor Manufacturing UK Ltd, which is approximately 440 m to the northeast of the site.

Within 100 m of the site boundary, other human receptors can be found as employees working within industrial buildings that are situated around the perimeter of the site. Ponds and connecting drainage exist outside of the site boundary are the closest surface water receptors. The River Dee is the nearest major surface watercourse, which is located to the south of the site, approximately 700 m south of the installation.

All sensitive receptors are included in Table 3, encompassing clean industry as well as human receptors. Within Figure 3, the indicative site boundary is highlighted in red, the first concentric ring is approximately 1 km from the centre of the site and the second concentric ring shows approximately 1.4 km from the centre of the site (to allow for the distance from the midpoint to the site perimeter). Sensitive receptors listed in Table 3 are also pinpointed on this map (in Figure 3), to highlight the location of these in relation to the site. It can be noted that the majority of the potential sensitive receptors that have been identified are not within 1 km of the site and are therefore much less susceptible to any potential environmental impacts possible arising from operations at the facility.

A wind rose for a representative meteorological station at Hawarden for 2024 is provided below in

Figure **4**. The meteorological site is approximately 6.4km southeast of the site and there is a difference in elevation of +5.6m. Both the proximity and elevation make this a suitable source of for the wind rose.

The data shows that the prevailing wind is from the south-eastly direction, and the wind speed is typically between 3.1 and 5.1 metres per second (6-10 knots). This indicates that emissions are likely to be dispersed to the north-west.

Within certain distances of the installation there are a number of sensitive ecological receptors (highlighted in Figure 5) that include Special Areas of Conservation (SAC), Sites of Special Scientific Interest (SSSI), and Ramsar sites. These are as follows:

- River Dee and Bala Lake (SAC) approximately 545 m southwest of the installation;
- River Dee (SSSI) approximately 545 m southwest of the installation;
- Dee Estuary (Ramsar site, SAC and SSSI) approximately 575 m southwest of the installation (adjacent to River Dee sites mentioned above);
- Two SACs and two SSSIs located within the relevant distance; and
- two areas of ancient woodland.

No National Nature Reserves (NNR), Marine Nature Reserves / Marine Conservation Zones (MNRs / MCZs) or Areas of Outstanding Natural Beauty (AONB) are situated within a relevant distance of the site.

Figure 3 - Nearby Sensitive Receptors, including Clean Industry

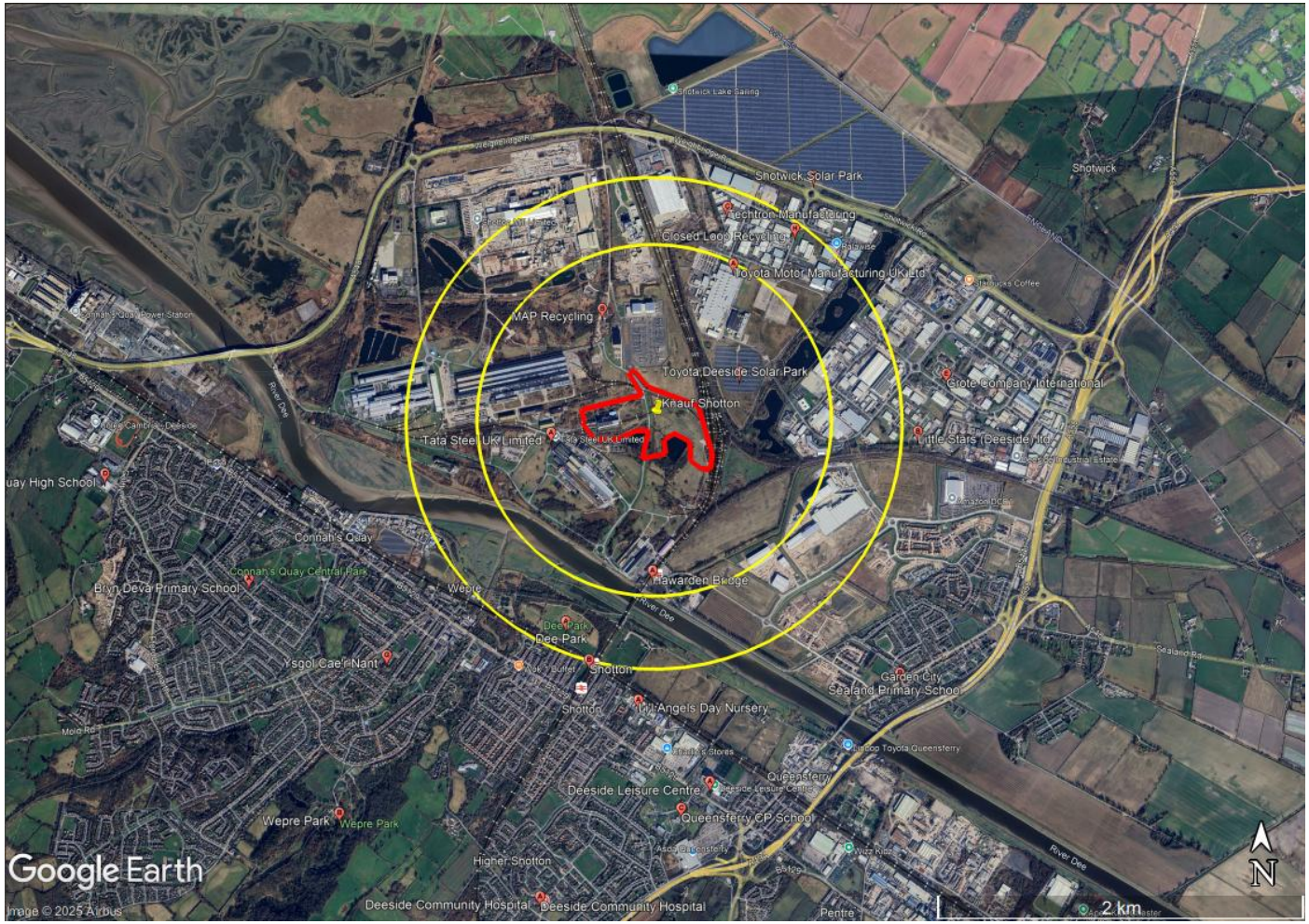


Figure 4 - Wind rose showing the average wind direction and strength at Harwarden (2024)

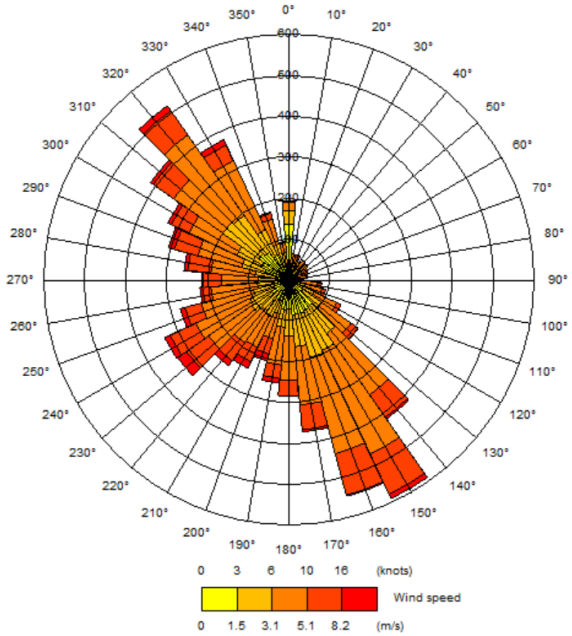


Figure 5 - Nearby Ecological Designated Sites

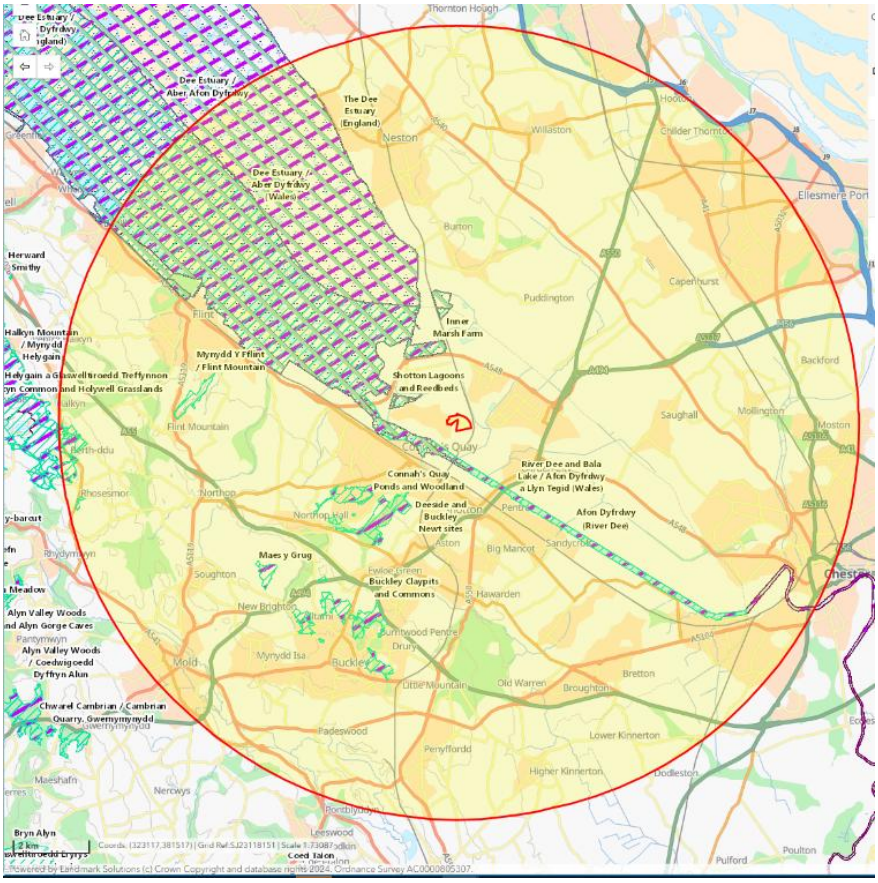


Table 3 - Distances to Selected, Representative Sensitive Locations, including Clean Industry Receptors

Boundary	Closest property	Approximate distance to Knauf Shotton site boundary (m)
Southwest	Tata Steel UK Ltd	120
Northeast	Toyota Deeside Solar Park	175
Northwest	MAP Recycling	375
Northeast	Toyota Motor Manufacturing UK Ltd	440
South	Hawarden Bridge Train Station	670
Southwest	Dee Park	940
Northeast	Closed Loop Recycling	1,120
West	Little Stars (Deeside) Ltd	1,150
Southeast	Sealand Primary School	1,150
Southwest	Housing estate	1,170
South	Shotton Train Station	1,180
South	Li'l Angels Day Nursery	1,360
Northeast	Shotwick Solar Park	1,470
South	Deeside Leisure Centre	1,650
Southwest	Ysgol Cae'r Nan	1,770
South	Queensferry CP School	1,900
Southwest	Bryn Deva Primary School	2,230
South	Deeside Community Hospital	2,440
Southwest	Wepre Park	2,480
West	Connah's Quay High School	2,700

Table 4 - Sources of Dust and / or Other Emissions

Company	Address	Type of Business	Distance from Knauf Shotton site boundary (m)
Southwest	Tata Steel UK Ltd	Steel fabricator	120
Northwest	MAP Recycling	Recycling Centre	375
Northeast	Toyota Motor Manufacturing UK Ltd	Car manufacturer	440
South	Hawarden Bridge Train Station	Train station	670
Northeast	Closed Loop Recycling	Recycling centre	1,120
South	Shotton Train Station	Train station	1,180

4 DUST AND PARTICULATE (PM10) MANAGEMENT

4.1 RESPONSIBILITY FOR IMPLEMENTATION OF THE DEMP

The Knauf Shotton Health, Safety and Environmental (HSE) Manager will be responsible for implementing this DEMP, which will form part of the overall Knauf Shotton EMS. They will be supported by the Knauf Shotton Plant Manager who will be responsible for the implementation and monitoring of the DEMP in the absence of the HSE Manager.

This DEMP will be subject to regular review on at least an annual basis and in accordance with Knauf Company Manage Change procedure. This DEMP will also be reviewed following:

- A change being identified as a result of a new risk assessment or updated risk assessment;
- A substantiated complaint from an off-site receptor;
- Following a change in processes at the site; and
- If new sources of fugitive emissions are identified.

The relevant Knauf SHEQ/HSE Department will develop and approve training content and the Knauf Shotton Plant Manager will be responsible for delivering approved training to support DEMP compliance and recording this on employee training records.

4.2 SOURCES AND CONTROL OF FUGITIVE DUST EMISSIONS

Error! Reference source not found. Table 5 below details the source pathway receptor model for the Knauf Shotton site. Table 6 lists the control measures, preventative measures and remedial measures used within the Knauf Shotton site.

4.3 OTHER CONSIDERATIONS

Water usage/ availability:

The overall site demand for water will be met by mains supply, which has been assessed to have >25m^3/hour of available supply. The demand of the process has been calculated to be a maximum of 11.3 m^3/hour. Therefore any water required for dust management and suppression will be available from mains supply. The site drainage system has been designed to capture surface water run-off from the whole of the site and a large attenuation system is available in the south to contain any drainage before it is discharged to the environment.

In the event of a drought:

Knauf considers the impacts of draught and a changing climate within the overall Environmental Management System. Since the primary forms of abatement do not require water suppression, this is not considered to be a significant risk to business continuity but will be regularly reviewed to take into account changing climatic conditions at the site.

Table 5 - *Source-Pathway-Receptor Routes*

Source		Pathway	Receptor	Type of Impact	Where relationship can be interrupted
Process Stages	Batch material unloading and storage	Escape from building and subsequent atmospheric dispersion	Receptors as detailed in Table 3 above.	Airborne particulates	Minimise source strength by means of low drop heights. Building construction prevents wind whipping. Particle filtrations at emission points to avoid dust release.
	Silo / batch preparation process	Escape from building and subsequent atmospheric dispersion	Receptors as detailed in Table 3 above.	Airborne particulates	Enclosed storage prevents wind whipping. Particle filtrations at emissions points to avoid dust release.
	Stone melting process	Exhaust gases	Receptors as detailed in Table 3 above.	Airborne particulates	Operations within an enclosed building. Abatement and filtration (via a bag filter) of exhaust gases from the melting process via the addition of fresh air, which also cools the temperature.
	Stone melting ‘tap out’ process	Escape from building and subsequent atmospheric dispersion	Receptors as detailed in Table 3 above.	Airborne particulates. Discolouration of emissions to air	Reducing ‘tap out’ requirements using a SAF melter reduces sources of fugitive emissions. Operations within an enclosed building.
	Stonewool formation and curing	Sawing process	Receptors as detailed in Table 3 above.	Airborne particulates	Operations within an enclosed building. The dust from the saw is extracted, scrubbed and merged with other

					downstream exhausts, preventing airborne release of particulates.
	Stone wool formation and curing	Exhaust gases of the drum and curing oven	Receptors as detailed in Table 3 above.	Airborne particulates	Operations within an enclosed building. A set of water scrubbers will be used to pre-scrub the exhaust gases, preventing airborne release of dust particulates.
	Fabrication line	Cutting process	Receptors as detailed in Table 3 above.	Airborne particulates	Operations within an enclosed building. A de-dusting system is employed to extract the dust from the cutting process. De-dusting system exhaust air will be filtered prior to discharge via the de-dusting stack or could be returned to the production building, avoiding high extraction of warm air during colder seasons.
	Recycling	Transport air	Receptors as detailed in Table 3 above.	Airborne particulates	Operations within an enclosed building. Transport air is filtered, prior to discharge through a single recycling stack, preventing airborne release of particulates.
Non-Process - Additional	Mud	Build-up of dust on vehicle wheels and then falling off when dry	Receptors as detailed in Table 3 above.	Visual soiling as well as re-suspension of airborne particulates	Long internal site roads ensure residual mud drops off before vehicle reaches public highway. Road sweeper employed as required.

	Debris	Falling from vehicles, particularly lorries	Receptors as detailed in Table 3 above.	Visual soiling as well as re-suspension of airborne particulates	Long internal site roads ensure residual debris drops off before vehicle reaches public highway. Cover lorries as required to minimise debris escaping during transit. Road sweeper employed as required.
	Tipping and unloading of raw materials and RMW Recycled products in the open	Atmospheric dispersion	Receptors as detailed in Table 3 above.	Visual soiling and airborne particulates	Tipping material outside of the building will not be a routine operation. Minimise source strength by means of low drop heights, profiling and shielding of piles from wind whipping.
	Vehicle exhaust emissions	Atmospheric dispersion	Receptors as detailed in Table 3 above.	Airborne particulates	Regulatory controls and best-practice measures to minimise source strength. Use of alternative fuelled vehicles as practical to meet site operational needs.
	Non-road going machinery exhaust emissions	Atmospheric dispersion	Receptors as detailed in Table 3 above.	Airborne particulates	Regulatory controls and best-practice measures to minimise source strength. Use of alternative fuelled vehicles as practical to meet site operational needs.

Table 6 - *Measures that will be used on site to control dust/particulates (PM_{10}) and other emissions*

Abatement Measure	Description / Effect	Overall consideration and implementation	Trigger for implementation
Preventative Measures			
Enclosure within a building	By creating a solid barrier between the source of dust particulates and the environment and receptors, there will be a high level of control of the dust and related emissions.	As this is a new site, the design of the facility will incorporate this preventative measure, ensuring processes that are expected to generate fugitive emissions are undertaken within a building. Operations being carried out within a building will prevent dispersion of lightweight materials by wind. Procedures shall be in place for the maintenance of buildings and their integrity.	All processes that have the potential to generate dust or fugitive emissions will be within a building. There are some storage areas that are not fully enclosed, however storage in this area will be limited to low-risk materials and also will involve alternative storage containers that are secure.
Negative pressure extraction	Some processes include controlled extraction can be implemented to ensure a constant negative pressure relative to the outside air.	Extraction systems present in specific locations are very effective in capturing fugitive emissions and passing them to appropriate abatement plant e.g.	Negative pressure extraction systems operate automatically and continuously during plant operation. Standard Operating Procedures for equipment operation will be

Abatement Measure	Description / Effect	Overall consideration and implementation	Trigger for implementation
	Extracted air is subject to filtration prior to discharge.	bag filters or wet electrostatic precipitator (WESP).	followed and staff will be trained in equipment use.
Reduced occurrences of 'tap out' procedure due to SAF melter	The installation will utilise a SAF melter and as a result, the incidents of 'tap out' are reduced and uses a different process compared to cupola melters.	Such measures will be embedded within the stone melting process so that fugitive emissions are minimised.	Standard Operating Procedures for equipment operation will be followed and staff will be trained in equipment use.
Dust extraction systems	There are a variety of methods and technologies that are available to combat particulate emissions. The installation will utilise WESP and bag filters. Coupled with local exhaust extraction, these measures can be very effective in dust and particulate removal.	Such measures will be embedded within processes across the facility to ensure fugitive emissions of particulates are prevented.	Dust extraction systems will be implemented across various processes that will occur on site and will be consistently utilised during the time of operation at the site. There will be a dust extraction system implemented at each potential source and pathway of dust release. Standard Operating Procedures for equipment operation will be followed and staff will be trained in equipment use.
Site / process layout in relation to receptors	Locating particulate emitting activities at a greater distance	Dust control has been considered in the site design and	Sensitive receptors are not within the immediate vicinity of the site

Abatement Measure	Description / Effect	Overall consideration and implementation	Trigger for implementation
	and downwind from receptors may reduce receptor exposure, provided that emissions from the source are not dispersed over significant distances.	good housekeeping Procedures will be utilised. Raw materials storage is on the west of the site and sensitive receptors are located to the east of the site. Building orientation prevents wind whipping of raw materials. Final product will be packaged for storage, preventing generation of dust and fugitive emissions from storage.	area. Therefore, the nature of this mitigation will only have impact on the industrial neighbouring sites, rather than the sensitive receptors, which are located slightly further afield.
Minimising drop heights within processes and use of enclosed chutes for drops / end of conveyor/ transfers and covered storage	Minimising the height at which materials in the process are handled reduces the distance dust and particulates can be blown across. Dispersion will be further reduced through the implementation of chutes and enclosure of storage.	Consideration of the height at which materials are handled is incorporated into the design of the process, particularly for the initial stages of batch mixing and subsequent transfer for melting. Chutes will be utilised where possible. Drops between conveyors will be minimised.	Storage silos and mechanical transfers of raw materials minimises and controls the drop height and will be automatically used.

Abatement Measure	Description / Effect	Overall consideration and implementation	Trigger for implementation
Good housekeeping	Regular checks for any build-up of dust and particulates carried out as part of routine housekeeping can be useful in ensuring that issues are remedied efficiently, preventing unnecessary emissions of dust and particulates.	A management-led approach will be key in the implementation of a housekeeping regime, undertaken by staff at the facility. They will have a particular focus for areas that other cleaning apparatus is unable to reach. Documentation of inspections and subsequent actions will be maintained, providing a clear log of measures undertaken. Responsibility of adherence to good housekeeping will be held by the Knauf Shotton HSE Manager. Removal of dust and particulates will be the responsibility of all Plant Operatives.	A routine will be implemented that will be maintained at all times during operation.
Sheeting of vehicles	Transport of inbound and outbound materials will be protected from causing any dust emissions via sheeting.	Inbound and outbound loads of materials or products, respectively, will be transported in secure loads that are either sheeted or fully enclosed, to	This will be part of routine operations. Inbound materials that are not under Knauf control may not be transported under such dust emission abatement

Abatement Measure	Description / Effect	Overall consideration and implementation	Trigger for implementation
		avoid particulate release. Management systems will ensure such measures are implemented.	measures, but this will be requested where reasonable to do so. Sheeting may also be required if a substantiated complaint is received from an off-site receptor, e.g. Tata Steel.
Hosing of vehicles upon exit	To ensure as much dust and particulates are removed from lower parts of vehicles as possible, prior to exiting the site, hosing of vehicles can be carried out.	A wheel wash is not currently anticipated to be needed but access to water supply and hose will be made available in the event of the presence of dusts.	This is not likely to be required as the materials being handled on site do not inherently pose such risks. Hosing of vehicles may also be required if a substantiated complaint is received from an off-site receptor, e.g. Tata Steel.
Ceasing operation during high winds and / or prevailing wind direction	Periods of strong winds is anticipated to result in a greater level of mobilisation of dust and particulates associated with materials handled on site. Cessation of operation during such periods could be key in reducing pollution events.	Weather conditions will be monitored in the event that significant wind events occur when operations are taking place outside of the building and generate excessive dust and particulates.	Not anticipated to be regularly and normally required. If high winds generate dust emissions, waste tipping will be reviewed or stopped outside of the building.

Abatement Measure	Description / Effect	Overall consideration and implementation	Trigger for implementation
		Staff will report incidents of dust generation via internal reporting mechanisms	
Easy to clean concrete impermeable surfaces	An easily cleaned surface, such as concrete, will be useful in reducing the amount of dust and particulate generated at ground level by site operations. This is compared to uneven or unmade ground. Site speed limit enforcement reduces re-suspension of particles.	The design of the site includes impermeable surfaces and roads throughout the entire site including site access roads, car parks, internal roads and within buildings. Visitors to site, including contractors delivering raw materials will be provided with copies of the site rules at site induction.	Normal and regular use of internal roads by vehicles. Site drainage will capture any wash waters used for cleaning small areas of site. Access to road sweeping equipment if required
Minimisation of waste storage heights and volumes on site	Handling of waste at a height that is as low as possible will reduce the distance over which dust and particulates can be dispersed. By reducing volumes of storage on site will reduce the surface area over which mobilisation of particulates can occur, as well as	Waste is normally stored inside of containers and inside of buildings so this measure will have limited effect on dust emissions. Continuous operations at the site will inherently manage volumes	Waste volumes are normally processed over a short time frame. In the event of unplanned downtime, waste storage will be reviewed and addressed as required (including stopping deliveries to the site).

Abatement Measure	Description / Effect	Overall consideration and implementation	Trigger for implementation
	the volumes of particulates that could be released.	stored on site and maintain them at minimal heights.	
Reduction in operations (waste throughput, vehicle size, operational hours)	During periods of especially windy weather, a reduction in activity on site would be key in reducing emissions of dust and particulates.	Weather conditions will be monitored in the event that significant wind events occur when operations are taking place outside of the building and generate excessive dust and particulates. Although the site operates 24/7, vehicle movements will be five days per week.	If weather conditions generates dust emissions, waste tipping will be reviewed or stopped outside of the building.
Remedial Measures			
On site sweeping	Larger debris, dust and particulates may be managed via regular sweeping regimes on site, however, finer particles may be further mobilised by such actions. Road sweeping vehicles are effective at brushing and collecting dust and particulates,	Routine housekeeping will be implemented at the facility and will also account for sweeping on site. Management systems will also consider this and ensure implementation of such routine measures.	On site sweeping will be incorporated into routine housekeeping measures, as part of normal operations on site. This will continue throughout the operation of the site. Limitations of this measure will relate to areas that cannot be reached by sweeping apparatus - these

Abatement Measure	Description / Effect	Overall consideration and implementation	Trigger for implementation
	through the use of dampening of dust immediately prior to sweeping and collecting. Filters and spray bars on road sweepers need to be maintained to ensure that dust and particulate movement does not become a H&S issue.		areas will be checked and addressed as part of other housekeeping measures. Remedial sweeping may also be required if a substantiated complaint is received from an off-site receptor, e.g. Tata Steel.
Water suppression (e.g. hoses and water jets, mist sprays, bowser supplies)	Site areas can be dampened down reducing dust and particulate dispersion, assisting in the cleaning of site areas, particularly when combined with sweeping. A bowser can be used to efficiently damp down large areas of the facility	Damping down may lead to production problems if raw materials become too damp and greater energy inputs is required into the SAF melter. Binder material is applied in downstream processes which will have a dampening effect on products. Most activities will occur inside of the building where water suppression is less practical. Water suppression could be water intensive over the wider site.	During periods of hot and dry weather conditions. If a substantiated complaint is received from an off-site receptor then additional water suppression may be required.

4.4 ENCLOSURE OF WASTE PROCESSING & STORAGE AREAS

Figure 1 shows the site layout and indicates which areas of the site are enclosed within a building and which areas of the site are not enclosed within a building.

Raw materials and manufacturing operations are all within a building that is enclosed on at least three sides. Milling of waste materials occurs inside of a closed building that will contain fugitive emissions and keep waste materials dry prior to their use within the manufacturing process.

The only area of the site which is not enclosed is the open pallet storage of finished products. This is not considered to be waste, as the primary function of the facility is to manufacture new insulation products for sale and therefore requirement to store these products inside of a building is not applicable. However, the finished product will be contained within primary (retail) packaging and enclosed within shrink wrap to prevent emissions of dust and particles.

4.5 VISUAL DUST MONITORING

There are currently no set dust monitoring locations, and the site is over 1 km from the nearest sensitive receptor.

Visual dust monitoring will be undertaken during regular periodic audits completed by the Knauf Shotton HSE Manager and incidents of dust pollution will be recorded on Knauf's central reporting system in line with the Knauf Procedure on incident reporting.

Visual dust monitoring will also be conducted by Plant Operators and in response to reactive maintenance caused by abnormal operations or plant failure that results in generation visible dust piles or emissions inside of the building.

In the unlikely event of dust emissions impacting on offsite receptors and resulting in a complaint, an incident investigation will be led by the Knauf Shotton Plant Manager, including completing a root cause analysis and implementation of changes as required to prevent a recurrence.

Incidents of dust pollution, whether linked to the operations of the site or from off-site sources will be recorded by the Plant Manager.

4.6 PARTICULATE MATTER MONITORING

The site is located within an existing industrial area but outside of an Air Quality Management Area. The site is over 1 km from the nearest sensitive receptor.

It is not expected that additional monitoring of fugitive particulate matter is required other than requirements within the Environmental Permit. Continuous monitoring of point source emissions will take place on specified emission points to demonstrate compliance with BAT AELs.

4.7 MONITORING LOCATION

There are currently no set dust monitoring locations and the site is over 1 km from the nearest sensitive receptor.

4.8 OPERATION OF THE PM MONITORING EQUIPMENT

Operations of point source emissions monitoring equipment will be automatic and data will be recorded within the site SCADA system for reporting to the regulator in line with the permit requirements. In the event of automatic monitoring identifying 'high' or 'high-high' dust emissions, the system will alert the control room operatives who will be able to make proactive adjustments to site operations.

As the risk of fugitive dust and particular emissions is low and the control measures are in place to reduce the risk to offsite receptors there will be no additional equipment used.

The presence or absence of monitoring equipment will be regularly reviewed and should further monitoring be needed, Knauf will engage with a specialist supplier and the regulator, as appropriate.

4.9 QUALITY ASSURANCE/QUALITY CONTROL AND RECORD KEEPING

Details of dust monitoring, incidents relating to dust pollution and complaints regarding dust at offsite receptors will be retained electronically within Knauf's centralised reporting system and stored in accordance with Knauf procedures. Additional information recorded by the Knauf Shotton Plant Manager will be retained locally at the Shotton site.

Should additional monitoring equipment be required, the contractor will be required to provide full details of:

i) The make and model of the monitoring equipment

ii) The serial number of the monitoring equipment;

iii) When, how and by whom the data is checked

iv) When the equipment is calibrated;

v) How the equipment is calibrated;

vi) Copies of the qualifications and training records of who carries out the calibration

vii) When and by whom the equipment is routinely inspected;

viii) If the equipment is damaged and/or no longer able to collect reliable data.

4.10 EQUIPMENT AND DATA MANAGEMENT

Point source emissions monitoring equipment connected to the site SCADA system will be installed and maintained by an approved contractor.

Day-to-day operations will be the ultimate responsibility of Knauf Shotton Plant Manager, delegated to relevant Plant Operators with support from approved contractors (as required). All staff and contractors will be suitably trained in how to use equipment safely and correctly. Maintenance will be completed in line with original equipment manufacturer recommendations.

As the risk of fugitive dust and particular emissions is low and the control measures are in place to reduce the risk to offsite receptors there will be no additional equipment used.

Information will be retained in accordance with Knauf Procedures on Management of Documents and in accordance with applicable requirements.

4.11 REPORTING OF DATA

Information relating to dust emissions will be reported to the regulator, Natural Resources Wales, in line with the requirements within the Environmental Permit for dust and particulate matter monitoring. Incidents of fugitive emissions of dust that result in pollution will also be reported to the regulator as per the relevant Notification Schedule from the Environmental Permit or by contacting Natural Resources Wales by telephone in an emergency on:

Natural Resources Wales: 0300 065 3000

4.12 ADDITIONAL DETAILED MONTHLY REPORTING

In the unlikely event of dust emissions impacting on offsite receptors and resulting in a substantiated complaint and following root cause analysis, additional monitoring may be commissioned from a specialist supplier in order to carry out additional monitoring to identify sources of dust/particulates. This will be completed to identify if sources of dust/particulates are coming from offsite sources or whether background levels are elevated by other regional or national sources.

5 ACTIONS WHEN ALARM IS TRIGGERED

When point source emissions for dust and particulate monitoring triggers an alarm on the site SCADA system, control room Operatives will be alerted and corrective action (including automatic PLC driven actions) taken which may include increasing or decreasing of fan speeds to extract more or less air via the bag filters. The SCADA system will automatically retain details of the event and actions.

If during one of the regular visual audits or if Plant Operatives make a report that dust and particulate emissions are having an offsite impact, the relevant Knauf Shotton Department Manager will be alerted and will assess the activities underway and nature of the raw materials being handled. If they are able to establish the cause of the emissions, these activities will be reduced or suspended as required to prevent further emissions. This may include cessation of handling of raw materials outside of the building or pausing tipping of wastes inside of the raw materials building. Where the source cannot be identified, they will make an assessment of all the activities and suspend those which are a likely cause of dust in order to reduce potential emissions. The site will use the information from the audit to document the event on the centralised reporting system.

Where sources of dust and particulates are impacting on the site from an off-site source, the details of event will be recorded on the Knauf centralised reporting system. This will include the: date, time and duration of the event; the weather conditions at the time of the event and known location of the source of the dust emissions.

If a complaint is received, the site will use all of the above information to identify if Knauf Shotton may have been the source and what actions were taken to reduce the impact on off-site receptors to substantiate the complaint.

Following receipt of a substantiated complaint, Knauf will investigate the complaint as per the Knauf company procedure for reporting and investigating incidents. Any lessons learned will be shared with relevant internal and external stakeholders.

6 REPORTING AND COMPLAINTS RESPONSE

Following receipt of a complaint and where it is substantiated that the Knauf Shotton site was the source of the emissions, Knauf will investigate the complaint as per the Knauf company procedure for reporting and investigating incidents.

Investigations into environmental incidents and complaints will be started within the day of the event and completed within 15 working days. For serious incidents, Knauf Shotton would aim to complete the investigation within 10 working days.

Incidents of fugitive emissions of dust that result in pollution will also be reported to the regulator as per the relevant Notification Schedule from the Environmental Permit or by contacting Natural Resources Wales by telephone in an emergency on:

Natural Resources Wales: 0300 065 3000

6.1 ENGAGEMENT WITH THE COMMUNITY

Knauf will identify all relevant stakeholders of the Knauf Shotton facility and will review this annually. Each relevant stakeholder, including stakeholders within the local community will have a defined communication approach documented within the EMS. Should Knauf Shotton have any negative dust impacts or incidents, these will be communicated to the local stakeholders, as required.

6.2 REPORTING OF COMPLAINTS

All complaints received by Knauf whether directly to the site or via Knauf's customer services will be recorded using the Knauf central reporting system. This will enable standardised information to be captured to aid with the investigation stage.

6.3 MANAGEMENT RESPONSIBILITIES

The Knauf Shotton Plant Manager has overall responsibility for this DEMP and all site staff will receive training on how to implement this plan. As required, due to complaints, environmental incidents or when this DEMP is updated, additional training will be provided to site staff.

When a complaint is received, it will be managed by the relevant Line Manager of the Department involved. Depending upon the severity of the complaint, this may be escalated to the Department or Plant Manager (as per the Knauf procedure for reporting and investigating incidents).

6.4 SUMMARY

Knauf Shotton will operate a rock mineral wool manufacturing facility at Shotton, Flintshire with the ability to operate 24 hours per day. The site has been designed to minimise fugitive emissions to air and is located away from sensitive receptors. The site is not expected to be a significant source of fugitive emissions due to normal operations being contained within a building and operation of an effective Environmental Management System designed to minimise the risk of pollution from the site.

The site management at Knauf Shotton will ensure the implementation of this DEMP and follow a Plan-Do-Check-Act approach to achieve continuous improvement. While there are a limited number of sources of fugitive dust and particulate emissions, the site will regularly review emissions and take necessary actions in the event of a substantiated complaint.

Site operations will mostly take place inside of a building and site surfaces are well made and impermeable. Equipment will be well maintained and if significant emissions are generated, operations may be paused to prevent further emissions of dust.

Dust incidents and pollution events will be recorded by Knauf and fully investigated. Any lessons learnt will be shared with internal and external stakeholders (as required). This DEMP will be regularly reviewed as part of the overall Knauf Insulation EMS.

8 First Street
Manchester
M15 4RP

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