Main Installation Report
Normal Variation (Asphalt Plant)
Celsa Manufacturing (UK) Ltd,
Tremorfa New Melt Shop. Tremorfa Works,
Seawall Road, Cardiff, CF24 5TH
Permit Ref: EPR/TP3639BH

On behalf of:
Celsa Manufacturing (UK) Ltd

Project Reference:
018-1666

Revision:
REV 00

Date:
July 2019

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Revision	**Date**	**Author(s)**	**Authorised by**	**Reason for Change**
00	09/07/19	MS	SPR	First issue to Harsco/Celsa

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Abbreviations

AST	Above Ground Storage Tank
ASR	Application Site Report
BAT	Best Available Technique
BGS	British Geological Survey
BREF	Best Available Techniques Reference Documents
DEFRA	Department for Environment Food and Rural Affairs
EA	Environment Agency
EAME	Earth and Marine Environmental Consultants Ltd
EMS	Environmental Management System
EPR	Environmental Permit
FRA	Flood Risk Assessment
FPMP	Fire Prevention Mitigation Plan
IPPC	Integrated Pollution Prevention and Control
IBC	Intermediate Bulk Container
mg/l	milligrams per litre
NGR	National Grid Reference
NRW	Natural Resources Wales
Opra	Operational Risk Appraisal
PPE	Personal Protective Equipment
PPM	Planned Preventative Maintenance
SCR	Site Condition Report
SSSI	Site of Special Scientific Interest

µg/l	micrograms per litre
WFD	Water Framework Directive

1 Introduction

1.1 Background

This document has been prepared by Celsa Manufacturing (UK) Ltd ("Celsa") and its environmental consultant Earth & Marine Environmental Consultants Ltd ("EAME") in support of a permit variation (normal) as required under Regulation 20 (variation) of the *Environmental Permitting (England and Wales) Regulations 2016 (as amended)* in relation to current activities and proposed activities to be undertaken at Tremorfa New Melt Shop. Tremorfa Works, Seawall Road, Cardiff, CF24 5TH (Permit No. EPR/TP3639BH).

An environmental permit application is required where an operator carries out certain prescribed activities, namely installations that undertake Schedule 1 activities, a waste operation or a mobile plant (carrying out either one of the Schedule 1 activity or a waste operation). The status log (history) for the permit is outlined in *Table 1-1*.

The Authorised company contact is Mr. Richard Lewis (Celsa Manufacturing (UK) Ltd, Environmental Manager).

Table 1-1: *New Melt Shop permit log (main events)*

Description	Date	Comments
Application TP3639BH.	Received 15/10/2004	-
Permit determined (TP3639BH).	03/05/2005	-
Variation and consolidation (EPR/TP3639BH/V002).	24/04/2012	Varied and consolidate permit issued in modern format. The following permits have been consolidated: EPR/TP3639BH, EPR/BU2098IP and EPR/WP3699FQ.
Regulation 6(1) notice of request for more information.	03/09/2013	-
Regulation 60(1) response received.	30/04/2014	Implementation of BAT conclusions under IED.
Natural Resources Wales Iron and Steel Sector Review 2014 permit EPR/3639BH. Variation issued EPR/TP3639BH/V003.	17/11/2015	Varied and consolidated permit issue in modern IED condition format.

Description	Date	Comments
Application PAN-000449. Variation determined EPR/TP3639BH/V004.	20/07/2016	Application to vary permit to add waste codes.
Application PAN-001189. Variation determined EPR/TP3639BH/V005.	24/01/2017	Application to increase millscale storage capacity.
Application for variation PAN-001610. Variation determined EPR/TP3639BH/V006.	20/06/2017	Application to add mechanical shearing to permitted activities as part of scrap metal pre-treatment.

The current permit boundary is outlined in Schedule 7 of the environmental permit (***Figure 1-1***)

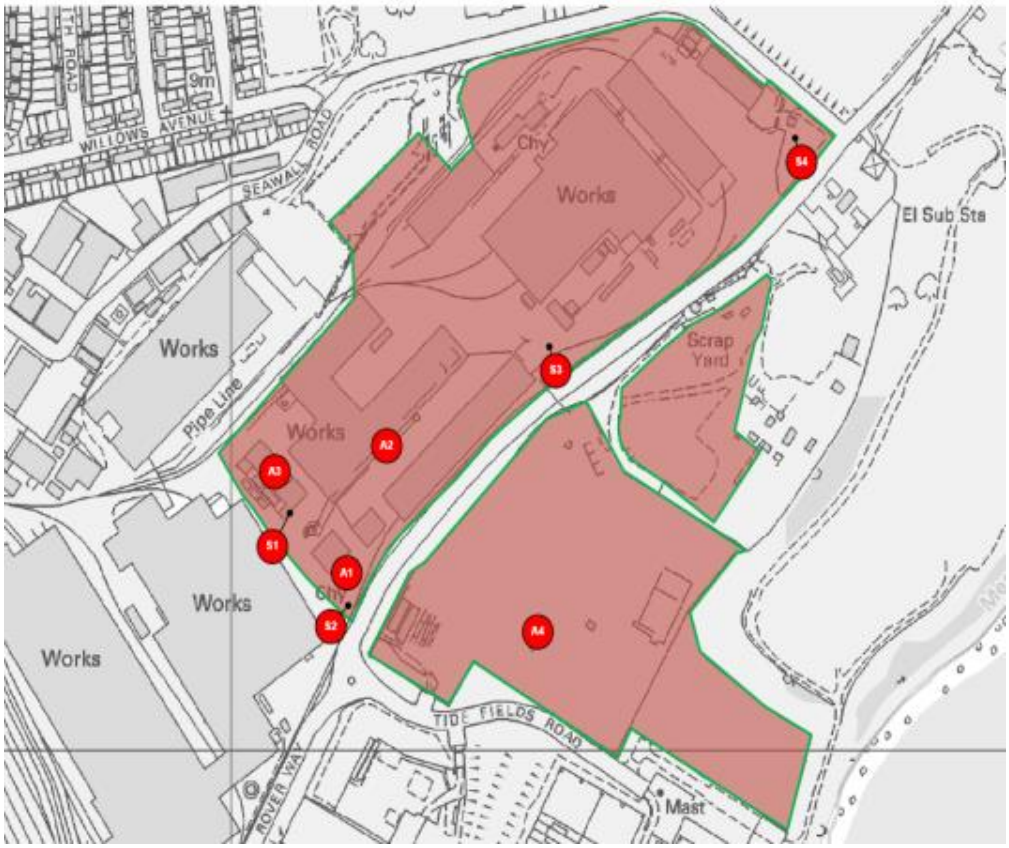


Figure 1-1: *Current New Melt Shop permit boundary*

In addition to the New Melt Shop permit Celsa also operates a waste process (Permit Ref. PAN-002220, Waste Returns Ref. EPR/DP3699FM) on the Rover Way site which was previously operated by Sims Group Ltd until transfer of the permit was completed on 05/02/2018.

EAME has been in contact with the local Natural Resource Wales (NRW) Senior Environment Officer (Mr. Gareth Richards) and it has been agreed that the application would be captured as a normal variation.

The document represents the Main Application Report submitted as part of the application package to the NRW (EAME Ref. 018-1666).

The main application report has been produced in accordance with NRW's, Environment Agency and Defra's current guidance as outlined within **Table *1-2***.

Table 1-2: *Technical Standards and Guidance*

Type	Reference
EPR Guidance	NRW (2014). How to comply with your environmental permit, Version 8, October 2014. Defra (2019). Develop a management system: environmental permits. https://www.gov.uk/guidance/develop-a-management-system-environmental-permits. Defra (2018). Control and monitor emissions for your environmental permit. https://www.gov.uk/guidance/control-and-monitor-emissions-for-your-environmental-permit.
Horizontal Guidance	Defra (2016). Risk assessments for specific activities: environmental permits, https://www.gov.uk/government/collections/risk-assessments-for-specific-activities-environmental-permits, 2 February 2016. H1 software tool and guidance. Defra (2016). Energy efficiency standards for industrial plants to get environmental permits, 1 February 2016. H2 Energy efficiency. Environment Agency (2004). Integrated Pollution Prevention and Control (IPPC) Horizontal Guidance for Noise H3 Part 2 – Noise Assessment and Control, Version 3, June 2004. NRW (2014). How to comply with your environmental permit, Additional guidance for: H4 Odour Management, Version 2, October 2014. NRW (2014). Environmental Permitting Regulations, Guidance for applicants H5, Site condition report – guidance and templates, Version 5.0, October 2014.

Type	Reference
BREFs	European Union (2012). Establishing the best available techniques (BAT) conclusions under Directive 2010/75/EU of the European Parliament and of the Council on industrial emissions for iron and steel production (2012/135/EU). European Union (2013). Best Available Techniques (BAT) Reference Document for Iron and Steel Production.
Sector Guidance	Defra (2012). Process Guidance Note 3/15(12), Statutory guidance for roadstone coating, September 2012. Environment Agency (2004). IPPC Guidance, Production of Coke, Iron and Steel, S2.01, Issue 1, June 2004.

The application package includes completed application forms that are cross-referenced to this technical submission, which is intended to address all the areas required by the variation application and a Site Condition Report (SCR) with supporting appendices. The various documents included with this application package are set out below:

- completed application forms (Part A, Part C2, Part C3 and Part F1);
- non-technical summary;
- technical submission and supporting information (this report);
- site condition report (SCR);
- current Opra assessment spreadsheet (NRW Version 3.6 – TP3639BH); and
- the application fees.

The above items should be regarded as constituting the variation application. In-line with the Form F1 guidance the variation application includes 1 x CD and 1 x paper copy of the application package.

The application has been submitted (via recorded delivery) to the Natural Resources Wales, Permit Receipt Centre, Natural Resources Wales, Cambria House, 29 Newport Road, Cardiff, CF24 0TP and sent by email to permitreceiptcentre@naturalresourceswales.gov.uk

The remainder of this document outlines the requirements requested by the NRW to progress the permit application.

1.2 Operational Risk Appraisal (Opra)

The fees associated with this (standard variation) application (£10,808) have been calculated using the current Opra spreadsheet (NRW Version 3.6 – TP3639BH) as agreed with the local NRW Senior Environment Officer (**Figure *1-2***).

Organisation Name:	Celsa Manufacturing UK Ltd	Case Number:	TP3639BH

EPR Installations Application Charge Calculation
(excludes Compliance Rating)
Scoring Summary - Financial

ENVIRONMENT AGENCY

Attribute	Band		Score	Total Score
Complexity	A	0	2	0
	B	0	15	0
	C	0	45	0
	D	0	82	0
	E	1	110	110
Emissions to Air	E			50
Emissions to Water	-			0
Emissions to Land	-			0
Emissions to Sewer	A			1
Emissions to Off-site Waste	B			2
Emissions - Waste Input	-			0
Location	C			20
Operator Performance	A			10
		Total Opra charging score		193.00

Transfer scores & calculate fees

Clear Scores

Indicative Fees & Charges

Application Fee	£	38,793.00
Subsistence Charge*	£	18,914.00
Substantial Variation	£	21,230.00
Standard Variation	£	10,808.00
Partial Surrender	£	18,528.00
Full Surrender	£	23,932.00
Closure	£	-

Part A(2) and Part B Activities
Please ensure that you have completed these entries in the Listed Activities sheet. The charge shown will not include any charges associated with Local Authority Part A (2) or Part B activities that form part of the installation.
Refer to Installations Charging Scheme for further details.

Opra Charge Multipliers	
Application	201
Subsistence	98
Substantial Variation	110
Standard Variation	56
Partial Surrender	96
Full Surrender	124
Closure (Landfill only)	

** Does not take into account Compliance Rating*

Figure 1-2: *Extract from EPR Installations Charge Calculation*

1.3 Payment Details

Celsa Manufacturing (UK) Ltd has paid the application fee via BACS to the following account:

- Company name – Natural Resources Wales, Income Dept. PO Box 663, Cardiff, CF24 0TP
- Bank – RBS, National Westminster Bank PLC, 2 Devonshire Square, London, EC2M 4BA
- Sort code – 60-70-80
- Account number – 10014438

- Payment reference number – EPRCELSAMANU0001

Notification of payment has been sent (including reference number) to: banking.team@cyfoethnaturiolcymru.gov.uk.

The remainder of this document outlines the requirements requested by the NRW to progress the permit application.

1.4 Concurrent Permit Variations

It is important to note that the following variations have been submitted to NRW and are awaiting formal determination (**Table *1-3***).

Table 1-3: *Current permit variations (awaiting determination)*

Ref.	Scope of Variation
018-1620 March 2019 Minor technical variation	The proposed amendment relates to Table S1.1 (A3) within the current permit which states 'shearing of up to 1000 tonnes of scrap metal per month prior to submission to the scheduled activity'. Celsa wishes to increase this limited to 5,000 tonnes of scrap metal per month to allow more flexible processing.
018-1620 May 2019 Normal variation	Variation Section 01 – Consolidation of the waste process (Permit Ref. PAN-002220, Waste Returns Ref. EPR/DP3699FM) on the Rover Way site into the New Melt Shop permit (Ref. EPR/TP3639BH). Variation Section 02 – Variation to include a new integrated scrap metal recycling centre (incorporating oversize material processing, material processing via vibro-flume and material processing via Eddy Current Separation (ECS) on the Rover Way site. Variation Section 03 – Variation to remove Carbon monoxide limit from New Melt Shop permit (Ref. EPR/TP3639BH) in relation to emission point A1 (100 mg/m^3, hourly average, continuous monitoring) in-line with current BAT reference documents (BREF). Variation Section 04 – Variation of the boundary of the current New Melt Shop permit (Ref. EPR/TP3639BH) to include the existing waste process (Permit Ref. PAN-002220) and the proposed new integrated scrap metal recycling centre.

Note: Variation Section 04 (May 2019) will extend permit boundary to include the asphalt plant and slag crushing activities (in relation to this permit variation).

2 Permitted Activities

2.1 Proposed Activity

Each of the proposals is described below in more detail including (where required) Schedule 1 references, proposed activity capacities and Directly Associated Activities (DAA). The scope of this variation is as follows:

Variation Section 01 – Variation to include new slag crushing and screening equipment combined with an adjacent asphalt plant. All activities are to be located within a compound on the Rover Way site.

The crushing and screening of waste slag by G R Plant Ltd (Company Director: Mr. Gareth Rees) (on behalf of Celsa) is already permitted (as a DAA) within the current permit (Ref. EPR/TP3639BH) as a Section 5.4 A(1)(b)(iii) activity. It is proposed that some new equipment is deployed on site to aid the processing of waste slag in order to feed the adjacent asphalt plant with aggregate. This equipment will be deployed within an area (compound) that is already covered by the current permit boundary. The new crushing and screening equipment will only supply the adjacent asphalt plant.

The treatment process will involve the crushing and screening of waste slag to recover high quality aggregates, which will be produced according to the quality protocol for aggregate from waste steel slag. The slag once recovered, will be used in the production of asphalt while metal will be re-used on-site (input into the New Melt Shop). The purpose-built asphalt plant supplied by Parker Plant will be operated by Harsco Metals. The use of the recovered aggregate in the production of the asphalt is normally covered by a Local Authority issued Part B permit but, in this case, it can be consolidated into the New Melt Shop permit as a DAA. After consultation with the NRW it has been agreed that the asphalt activities should be permitted as a Section 3.5 Part B(e) activity *i.e.* coating road stone with tar or bitumen.

As a result, Schedule 1 of the New Melt Shop permit (EPR/TP3639BH) will need to be revised to include the new asphalt activity. The suggested revision is outlined in *Table 2-1* (Activity A10).

The proposed changes/additions to Permit Ref. EPR/TP3639BH, Schedule 2 - Table S1.1 are outlined in red within ***Table 2-1***.

Table 2-1: *Proposed Schedule 2 (Operations) Changes – Table S1.1*

Activity Ref.	Activity listed in Schedule 1 of the EP Regulations	Description	Limits of specified activity and waste types
Table S1.1 Activities			
A1	NO CHANGES	-	-
A2	Section 5.4 Part A(1) (b) (iii) Recovery or a mix of recovery and disposal of non-hazardous waste in an installation with a capacity of over 75 tonnes per day (or 100 tonnes per day if the only waste treatment activity is anaerobic digestion) involving one or more of the following activities, and excluding activities covered by Council Directive 91/271/EEC - treatment of slags and ashes.	Slag collection and transfer from installation to waste operation Cooling and breaking of hot metal residues by drop balling and oxygen lancing prior to return to the electric arc furnace. Processing of weathered slag (by mobile crushing and screening equipment) to solely feed the asphalt plant. R4: Recycling/ reclamation of metals and metal compounds R13: Storage of waste pending any of the operations numbered R1 to R12 (excluding temporary storage, pending collection, on the site where it is produced)	The limits of specified and associated activities collectively comprise all activities carried out in the installation between the receipt of raw materials and the supply of finished products. Waste types as listed in table S2.2.
A3	Coating of road stone with tar or bitumen [Schedule 1 Activity – Chapter 2, Section 3.5, Part B(e)	Asphalt plant used for the manufacture of coated roadstone using processed slag as the main aggregate.	Processing capacity of asphalt plant is 320 tonnes per hour.

Activity Ref.	Activity listed in Schedule 1 of the EP Regulations	Description	Limits of specified activity and waste types
Directly Associated Activities			
A4	NO CHANGES	-	-
A5	NO CHANGES	-	-
A6	NO CHANGES	-	-
A7	NO CHANGES	-	-
A8	NO CHANGES	-	-
A9	NO CHANGES	-	-
A10	NO CHANGES	-	-
Notes: Existing text is outlined 'black' with proposed changes in 'red'. DAA Activity Ref. have being increased by one number due to the inclusion of activity A3.			

2.2 Medium Combustion Plant Directive (MCPD)

Subject to the exclusions contained in Article 3[1], the MCPD applies to all combustion plant with a rated thermal input of equal to or greater than 1 MWth and less than 50 MWth regardless of the type of fuel used ('Medium Combustion Plant') ('MCP').

Combustion plant in which the gaseous products of combustion are used for direct heating, drying or other treatment of materials are out of scope, this includes asphalt plants (*i.e.* where the gaseous products of combustion are used for drying and heating aggregates before inclusion in the asphalt as part of a manufacturing process).

1 Medium Combustion Plant Directive (Directive 2015/2193/EU) ('MCPD')

2.3 Waste Types

No new waste codes are required to be added to Schedule 2 Table S2.3 of the New Melt Shop Permit No. EPR/TP3639BH. The EAF slag is already covered under waste code 10 (**Figure *2-1***).

Table S2.3 Permitted waste types and quantities for Waste Transfer Station and Treatment	
Maximum quantity	The total quantity of waste accepted at the site shall be less than 450,000 tonnes a year subject to storage limits for specified waste in Table S1.1.
Waste code	**Description**
10	**WASTES FROM THERMAL PROCESSES**
10 02	Wastes from the iron and steel industry
10 02 01	Wastes from the processing of slag
10 02 10	Millscales
10 02 99	Wastes not otherwise specified

Figure 2-1: *Extract from Sch. 2 Table S2.3 of No. EPR/TP3639BH*

Waste codes 10.02.01 (wastes from the iron and steel industry from slag processing) and 10.02.02 (unprocessed slag waste from the iron and steel industry) are covered by Aggregate from waste steel slag: quality protocol (4th May 2016)[2].

2 https://www.gov.uk/government/publications/aggregate-from-waste-steel-slag-quality-protocol/aggregate-from-waste-steel-slag-quality-protocol

3 Operations – Slag Crushing and Screening

3.1 Introduction

SteelPhalt (part of Harsco Metals) has been developing and manufacturing high performance asphalt products for the UK roadmaking industry since the 1960s. Based in Rotherham, South Yorkshire, SteelPhalt is a sustainable way of making asphalt since at least 95% of the product is recycled reducing the need to landfill waste materials.

Electric Arc Furnace (EAF) steel slag is a by-product of the manufacture of steel by the EAF process. An EAF produces steel by the melting of recycled steel scrap, using heat generated by an arc, created by a large electric current. The slag is formed through the addition of lime, which is designed to remove impurities from within the steel. Steel slag contains quantities of uncombined (free) lime in the form of calcium and magnesium oxides, which expand in the presence of moisture. In order to reduce this potential expansion, the slag must undergo controlled conditioning, or 'weathering'. It can be crushed and screened in the same manner as for natural aggregates, to produce aggregate chippings for use in a variety of applications. EAF steel slag is a strong, dense, non-porous aggregate that is cubical in shape, has good resistance to polishing and has an excellent affinity to bitumen. This makes it an ideal aggregate for asphalt surface course materials and road surface treatments as it produces materials that are resistant to deformation (rutting), safe and durable. The sustainable credentials of asphalt products using steel slag have resulted in a gradual increase in its use.

The process enables the recovery of slag from the steel making process thus reducing reliance on disposal to landfill. By recovering waste materials, the need to source virgin materials is also reduced.

3.2 Mobile Screening and Crushing Plant

The crushing and screening operation would consist of a one scalping screen, one cone crusher and a two 4-way finishing screens (**Figure *3-1***). All equipment associated with this part of the installation would be mobile (*i.e.* small-scale tracked equipment). This part of the process would be operated by one excavator, one-wheel loader and one dumper truck.

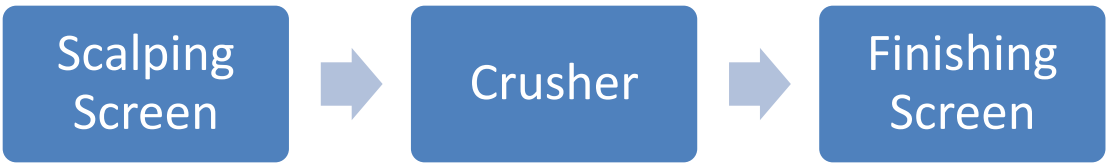


Figure 3-1: *Slag screening and crushing process*

The equipment shall be in a dedicated compound located on the Rover Way site (**Figure *3-2***).

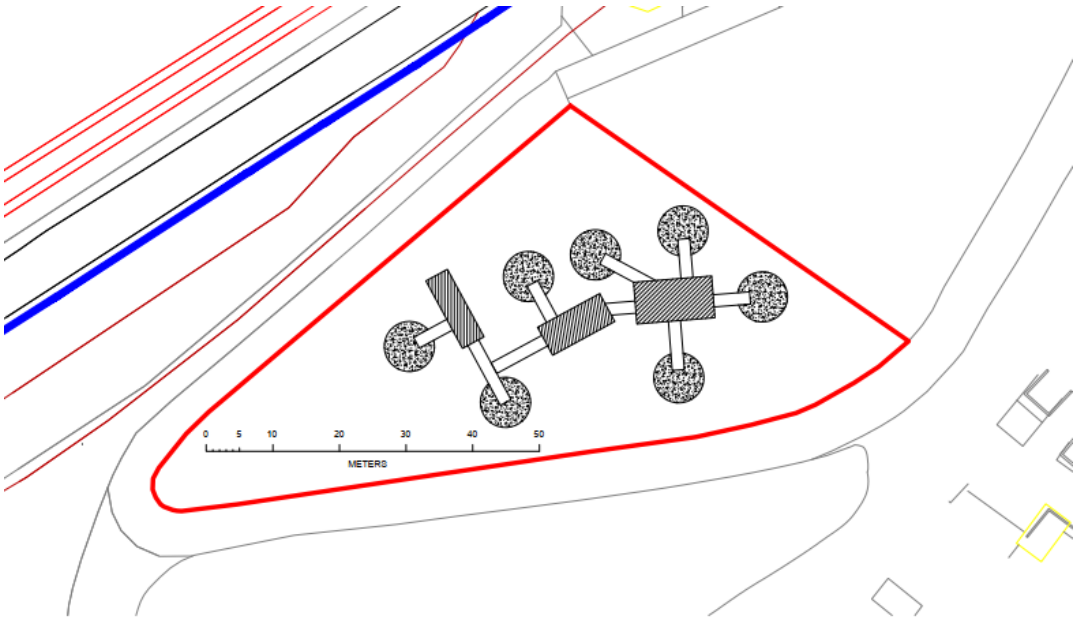


Figure 3-2: *Proposed slag screening and crushing site layout*

Harsco (2018). New Aggregate and Asphalt Plants at Celsa Cardiff, Location Plan (Option 7.5), DRG No. 01994-00-01-07.05, Scale 1:1250

The NRW permitting guidance[3] requires submission of a formal Fire Prevention & Mitigation Plan Guidance (FPMP) where a waste operator store any amounts of combustible waste materials. The Safety Data Sheets (SDS) for EAF slag state that the material is non-combustible. A formal FPMP has not been submitted with this application.

The area will be operated by G R Plant Ltd (Company Director: Mr. Gareth Rees). G R Plant Ltd currently undertake crushing, screening and metal recovery operations on the Rover Way site for Celsa.

The proposed equipment that is to be deployed within the slag screening and crushing area is outlined below.

3 NRW (2017). Fire Prevention & Mitigation Plan Guidance – Waste Management Guidance Note 16, Document Owner: Regulatory Business Board, August 2017, version 2.0

3.2.1 Scalping screen – Terex Finlay 883+ (one unit)

To purpose of the machine is to scalp feed materials into different sizes using heavy duty decks or grizzly bars. They are designed to withstand high impact and large, abrasive materials.

The high-performance Terex Finlay 883+ is designed to work after a primary crusher or on its own as a frontline tracked mobile screening machine. The plant has the capacity to process at a rate of up to 500 tonnes per hour and can be fed either by a tracked mobile crusher or an excavator (**Figure *3-3***). Reported sound pressure level (operator level) is 98 dB(A). The equipment (classed as Non-Road Mobile Machinery) uses a Caterpillar C4.4 110hp that meets EURO IV standards. It has been estimated that the machine will utilise around 100 litres of diesel per day.

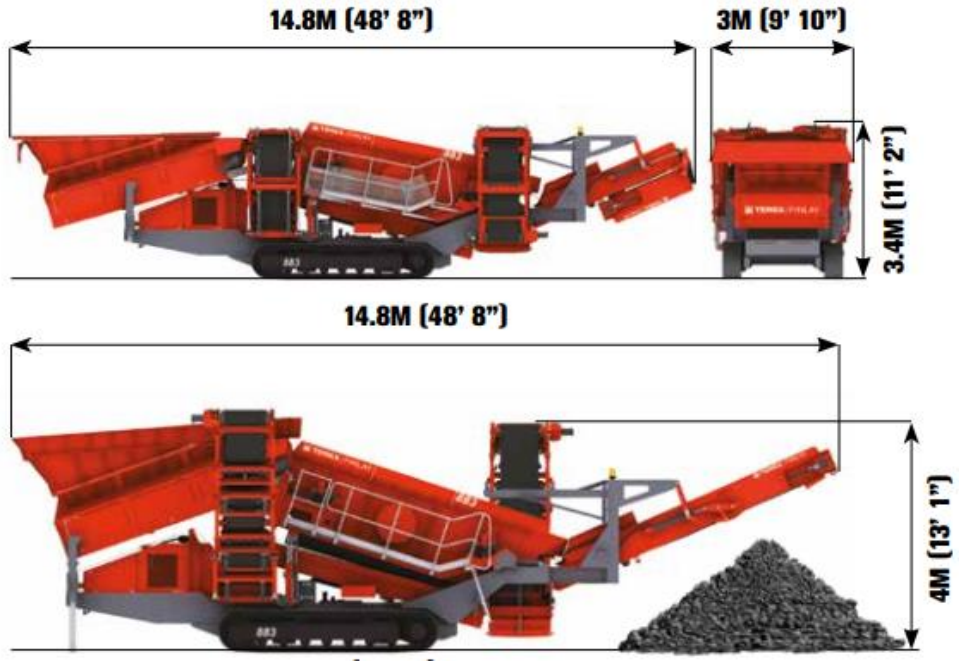


Figure 3-3: *Terex Finlay 883+ Scalping Screen*

3.2.2 Cone Crusher – Terex Finlay C-1540 (one unit)

A cone crusher is a compression type of machine that reduces material by squeezing or compressing the feed material between a moving piece of steel and a stationary piece of steel. Final sizing and reduction is determined by the closed side setting or the gap between the two crushing members at the lowest point.

The fuel-efficient direct drive Terex Finlay C-1540 cone crusher is the optimum machine for medium sized producers and contract crushing operators. This machine features the proven Terex 1000 cone crusher that is choke fed with integrated level sensor, automatic tramp relief and hydraulic closed side setting (CSS) adjustment. The large hopper/feeder has an automated metal detection and a purge system to protect the cone and reduce downtime by removing metal contaminants via the purge chute. Reported sound pressure level of Scania DC13 83A engine is 118 dB(A). The equipment (classed as Non-Road Mobile Machinery) uses a Scania DC09 350hp that meets EURO IV standards. It has been estimated that the machine will utilise around 400 litres of diesel per day.

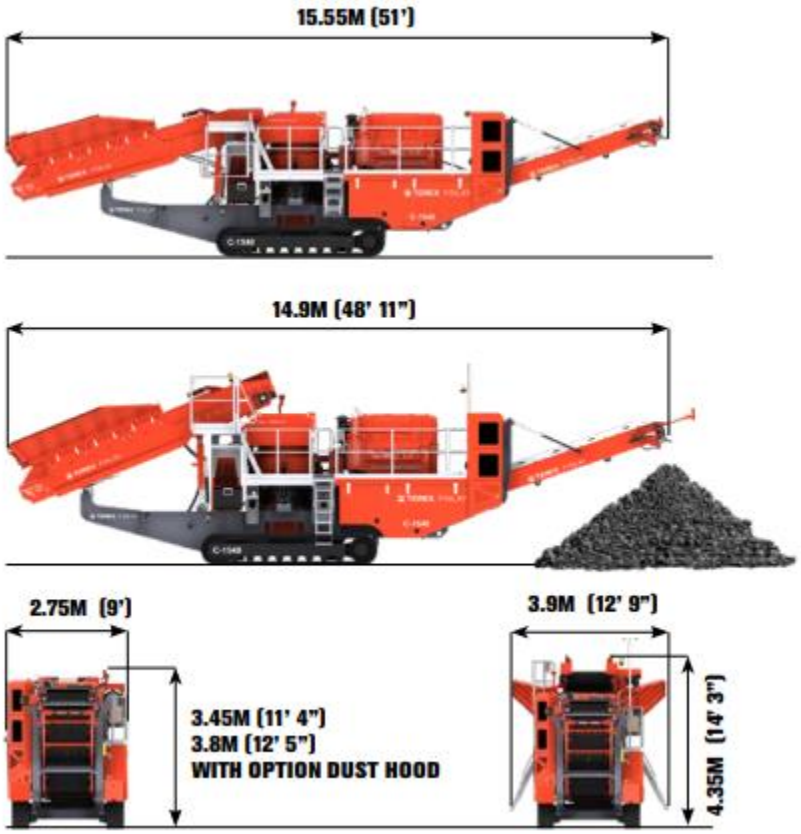


Figure 3-4: *Terex Finlay C-1540 Cone Crusher*

3.2.3 Inclined Finishing Screen – Terex Finlay 694+ (two units)

To finishing screen is used to separate feed materials into different sizes using a vibrating screen that is mounted on a mobile frame.

The Terex Finlay 694+ is the industry's leading tracked mobile inclined screen. A high capacity belt feed hopper is available with remote tipping grid or double deck vibrating grid. The triple deck screen configuration provides three full sized 6.1 m x 1.53 m screens (**Figure *3-5***). Reported sound pressure level of Supertrak Engine TCD2012L04 is between 88 and 98 dB(A) depending on position (1 metre from equipment). The equipment (classed as Non-Road Mobile Machinery) uses a Caterpillar C4.4 131hp that meets EURO IV standards. It has been estimated that one machine will utilise around 100 litres of diesel per day (200 litres per day in total).

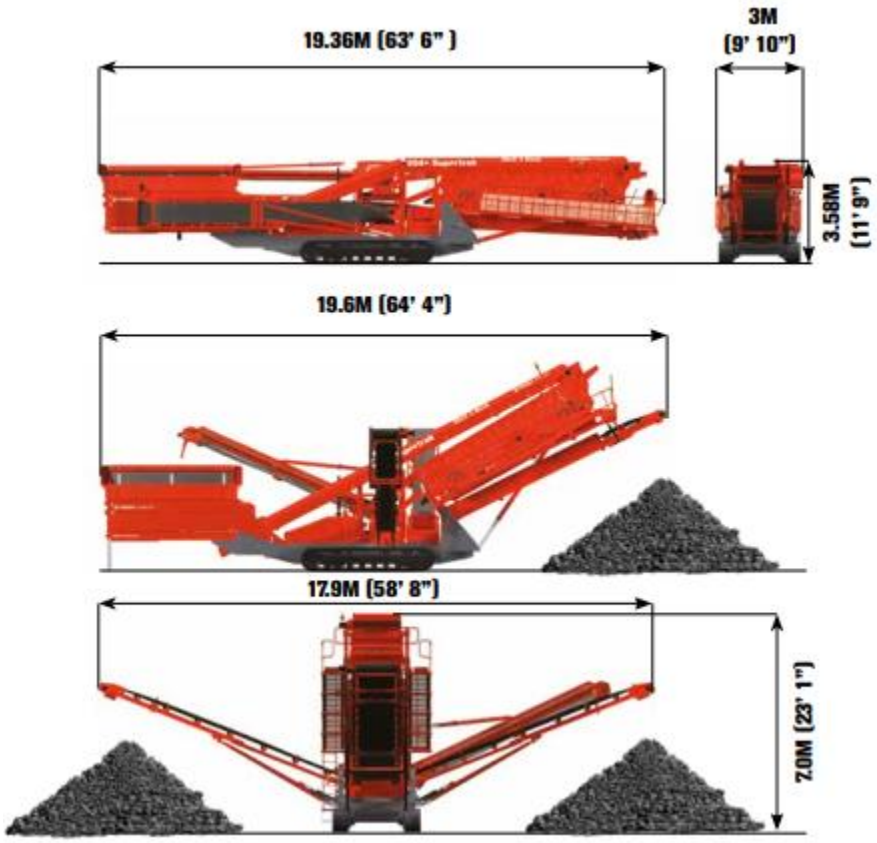


Figure 3-5: *Terex Finlay 694+ Screener*

Once the processed slag has been crushed and screened to remove the metallic fraction it leaves a quality aggregate. The arising slag aggregate will be fed into the asphalt plant (*Section 0*).

On average, based on Harsco Metals Group experience, a metal recover rate of approximately 6% can be obtained from the slag processing operation. 100% of the remaining processed slag can be used within the asphalt process *i.e.* there is no zero waste.

Water Use

Water use within the installation is minimal and is used solely for dust suppression purposes. It is anticipated that dust suppression water will either be provided from town's main or (more likely) from the on-site Celsa abstraction (Ref. 21/57/25/78).

Waste

The crushing and screening plant are a zero-waste solution with nothing going to landfill. The only waste received at the installation relate to the weathered slag from the Celsa steel works. The only waste stream that may arise from the operation of the slag crushing and screening plant is during maintenance. These wastes will be managed in accordance with the existing Company waste management procedure.

All materials, once processed, shall be moved from the crushing area to the asphalt plant storage bays using a wheeled articulated haul truck (*e.g.* Cat 725). All refuelling of vehicles and plant will be undertaken using existing refuelling stations that form part of the existing permit.

3.3 BAT Assessment

'Best available techniques' (BAT) means the available techniques which are the best for preventing or minimising emissions and impacts on the environment. 'Techniques' include both the technology used and the way your installation is designed, built, maintained, operated and decommissioned.

The European Commission produces BAT reference documents or BREF notes. They outline BAT for specific installations. An operator must state whether it's going to follow each BAT, either BAT conclusions (BATc) and meet the BAT-associated emissions level (BAT AEL) or BREF note and the technical guidance for activities that don't have BAT conclusions or propose an alternative.

In relation to slag crushing and screening the BAT conclusions under Directive 2010/75/EU of the European Parliament and of the Council on industrial emissions for iron and steel production are considered relevant to the process[4]. An assessment, against the BATc requirements, is outlined within **Table *3-1***.

4 European Union (2012). COMMISSION IMPLEMENTING DECISION of 28 February 2012 establishing the best available techniques (BAT) conclusions under Directive 2010/75/EU of the European Parliament and of the Council on industrial emissions for iron and steel production (notified under document C(2012) 903)

Table 3-1: *Slag crushing and screening BAT Assessment*

BATc Ref.	BATc Requirement	BATc Assessment	Conclusion
Environmental Management Systems			
1	BAT is to implement and adhere to an environmental management system (EMS) that incorporates all the features outlined in I to IX.	Celsa Manufacturing (UK) Ltd operates an environmental management system (EMS) that has been independently certified as conforming to the requirements of ISO14001 and EMAS, the international environmental management systems standard. The features set out in the BAT conclusion are all requirements of ISO14001. This ensures BAT is achieved.	BAT
Energy Management			
2	BAT is to reduce thermal energy consumption by using a combination of the techniques outlined in I to IV.	In accordance with the Celsa environmental commitment to manage and reduce impact energy reduction programmes have been established and maintained. Furthermore, as part of the EMAS scheme, Celsa has a public obligation to report its environmental metrics annually (either calculated or via direct measurement). The aim of this is to evaluate the environmental impact of Celsa's activities (*i.e.* buildings, processes and transport *etc.*) and identify opportunities for improvement. These opportunities are reflected in the site improvement objectives that form part of the ISO 14001 EMS. Celsa is Corporately required to implement the ESOS requirements. Therefore, the activities will be subject to energy audits (as per the stated scheme) to identify opportunities to improve energy usage and consumption. In addition, planned preventative maintenance (PPM) is carried out on a	BAT

BATc Ref.	BATc Requirement	BATc Assessment	Conclusion
		regular intervals in-line with operational or manufacturers recommended frequencies.	
3	BAT is to reduce primary energy consumption by optimisation of energy flows and optimised utilisation of the extracted process gases such as coke oven gas, blast furnace gas and basic oxygen gas.	BAT not applicable. This is not applicable to the slag crushing and screening activities.	N/A
4	BAT is to use desulphurised and dedusted surplus coke oven gas and dedusted blast furnace gas and basic oxygen gas (mixed or separate) in boilers or in combined heat and power plants to generate steam, electricity and/or heat using surplus waste heat for internal or external heating networks, if there is a demand from a third party.	BAT not applicable. This is not applicable to the slag crushing and screening activities.	N/A
5	BAT is to minimise electrical energy consumption by using one or a combination of the techniques (I – II).	As stated above (BAT 2) an energy reduction programme will be established and maintained. One of the main objectives will be to identify energy efficiency opportunities and increase energy awareness. Energy reduction is an on-going process that is operated throughout Celsa.	BAT
Material Management			
6	BAT is to optimise the management and control of internal material flows in order to prevent pollution, prevent deterioration, provide adequate input quality, allow reuse and recycling and to improve the process efficiency and optimisation of the metal yield.	Management of wastes is underpinned by a material flows hierarchy, where possible potential wastes are avoided through prevention and minimisation at the source. When these options are not feasible the emphasis is upon reuse or recycling of materials and by-products to avoid waste arisings. Internal material flows are carefully controlled to prevent deterioration and to provide adequate input quality.	BAT

BATc Ref.	BATc Requirement	BATc Assessment	Conclusion
		Material flow through the process is managed in order to minimise the storage of materials and thereby reduce airborne dust emissions from storage areas. The stockpiles are regularly checked. When weather conditions dictate its use, water is sprayed onto the stockpiles to minimise fugitive dust release from a mobile tractor bowser. The pre-watered slag goes through the process to recover as much ferrous metal as possible and grade the remaining slag for use in the asphalt surface coating plant. Additional measures to minimise pollution arising from materials storage, handling and transport are detailed in BAT 11.	
7	In order to achieve low emission levels for relevant pollutants, BAT is to select appropriate scrap qualities and other raw materials. Regarding scrap, BAT is to undertake an appropriate inspection for visible contaminants which might contain heavy metals, in particular mercury, or might lead to the formation of polychlorinated dibenzodioxins/furans (PCDD/F) and polychlorinated biphenyls (PCB).	BAT not applicable. This is not applicable to the slag crushing and screening activities.	N/A
Management of process residues such as by-products and waste BAT assessment			
8	BAT for solid residues is to use integrated techniques and operational techniques for waste minimisation by internal use or by application of specialised recycling processes (internally or externally).	The steel slag is crushed and screened, recovering the metal content of the slag leaving the remaining steel slag as high-quality asphalt aggregate. Metal recovered from slag recycled back to the main Celsa operations. Based on Harsco Metals Group experience, a metal recover rate of approximately 6% can be obtained from the slag processing operation. 100% of the remaining processed	BAT

BATc Ref.	BATc Requirement	BATc Assessment	Conclusion
		slag can be used within the asphalt process *i.e.* there is no zero waste.	
9	BAT is to maximise external use or recycling for solid residues which cannot be used or recycled according to BAT 8, wherever this is possible and in line with waste regulations. BAT is to manage in a controlled manner residue which can neither be avoided nor recycled.	All materials processed through the plant are recyclable either through the asphalt plant or via the EAF.	BAT
10	BAT is to use the best operational and maintenance practices for the collection, handling, storage and transport of all solid residues and for the hooding of transfer points to avoid emissions to air and water.	Solid residues are managed in the same manner as raw materials *i.e.* in-line with BAT 11.	BAT
11	BAT is to prevent or reduce diffuse dust emissions from materials storage, handling and transport by using one or a combination of the techniques mentioned (I to IX). I. General techniques	Celsa operates a certified Environmental Management System. Within this system there are formal processes to reduce diffuse dust emissions. Daily observations are conducted to proactively manage sources of diffuse dust emissions.	BAT
	II. Techniques for the prevention of dust releases during the handling and transport of bulk raw materials	Formal fugitive dust emission guidance is in place. All raw materials are transported to allocated areas for storage. Stockpiles are kept to minimum. Operator awareness training includes preventing unnecessary dust emissions. The site roads are swept regularly, and the haul road is dampened by water spray (when required). There are procedures for the transport of raw materials by dumper truck in order to minimise spillages *e.g.* loading/unloading of materials, maximum fill levels. The speed limit on site roads is a maximum of 10 mph.	BAT

BATc Ref.	BATc Requirement	BATc Assessment	Conclusion
	III. Techniques for materials delivery, storage and reclamation activities.	Drop height of material transfer points and disturbance of stockpiles are minimised. The plant can be stopped almost immediately in the event of equipment failure or operational issue, so there is a low risk of prolonged excessive emissions. All aspects of the plant are checked for maintenance requirements on a planned basis and in accordance with the PPM schedule. Daily pre-start checks, and regular servicing schedules are undertaken for all plant and mobile equipment. The disturbance of stockpiles is generally kept to a minimum because it reduces the risk of spillage or loss of material. There are work instructions and training programmes in place detailing how to minimise environmental impacts. In addition, all raw materials are reclaimed from one face of the stockpile only, so that disturbance of the stockpile is reduced. The shape of each stockpile is controlled by the size of the designated area within the stockyard for the stockpile. There are space restrictions within the stockyard and therefore each material must be stockpiled in a specific location. The equipment used for stocking or reclaiming material also controls the height and general shape of each stockpile.	
	IV. Where fuel and raw materials are delivered by sea and dust releases could be significant.	BAT not applicable. Delivery of materials by sea does not occur.	N/A
	V. Train or truck unloading techniques.	Normal aggregate handling equipment is to be deployed on the site. This would include one excavator, one-wheel loader and one dumper truck. There are procedures for the transport of raw materials by dumper truck in order to	

BATc Ref.	BATc Requirement	BATc Assessment	Conclusion
		minimise spillages *e.g.* loading/unloading of materials, maximum fill levels. The speed limit on all site roads is 10 mph.	
	VI. For highly drift-sensitive materials which may lead to significant dust release.	BAT not applicable. As this is mobile equipment the use of totally enclosed plant that is extracted to a bag filter is not considered appropriate. In addition, the use of central or local vacuum cleaning systems rather than washing down for the removal of spillage are not considered appropriate.	N/A
	VII. Techniques for the handling and processing of slag.	The mobile crushing equipment is enclosed. Slag is transported by shovel loaders or dumpers dependant of the quantity of the slag to be moved. Wetting of slag storage heaps is conducted when environmental conditions dictate.	BAT
	VIII. Techniques for handling scrap include.	BAT not applicable. This is not applicable to the slag crushing and screening activities.	N/A
	IX. Techniques to consider during material transport.	There are procedures in place for the loading of vehicles. Training is provided to operators. Behaviour observation system are in place. If significant spillages are observed, then it is recorded on a database and investigated further to determine how and why it happened. All transport movements are kept to a minimum to minimise environmental impact and to maximise operation efficiencies. There is a technical program in place to maximise return loads, minimise idling time and reduce movements. Preventative maintenance programs are in place.	BAT
Water and Wastewater Management			

BATc Ref.	BATc Requirement	BATc Assessment	Conclusion
12	BAT for waste water management is to prevent, collect and separate waste water types, maximising internal recycling and using an adequate treatment for each final flow. This includes techniques utilising, *e.g.* oil interceptors, filtration or sedimentation.	BAT not applicable. No wastewater is generated as part of the process.	N/A
Monitoring			
13	BAT is to measure or assess all relevant parameters necessary to steer the processes from control rooms by means of modern computer-based systems in order to adjust continuously and to optimise the processes online, to ensure stable and smooth processing, thus increasing energy efficiency and maximising the yield and improving maintenance practices.	BAT not applicable. This is not applicable to the slag crushing and screening activities.	N/A
14	BAT is to measure the stack emissions of pollutants from the main emission sources from all processes included in the Sections 1.2 – 1.7 whenever BAT-AELs are given and in process gas-fired power plants in iron and steel works.	BAT not applicable. This is not applicable to the slag crushing and screening activities.	N/A

BATc Ref.	BATc Requirement	BATc Assessment	Conclusion
15	For relevant emission sources not mentioned in BAT 14, BAT is to measure the emissions of pollutants from all processes included in the Sections 1.2 – 1.7 and from process gas-fired power plants within iron and steel works as well as all relevant process gas components/pollutants periodically and discontinuously. This includes the discontinuous monitoring of process gases, stack emissions, polychlorinated dibenzodioxins/furans (PCDD/F) and monitoring the discharge of waste water but excludes diffuse emissions (see BAT 16).	There are no point source emissions from any point of the activity. Fugitive emissions are covered by BAT 16.	N/A
16	BAT is to determine the order of magnitude of diffuse emissions from relevant sources by the methods mentioned below. Whenever possible, direct measurement methods are preferred over indirect methods or evaluations based on calculations with emission factors.	Emissions from slag crushing and screening activity have been estimated. The emission factors from US EPA AP 42 have been used to assess emissions from material handling process.	BAT
Decommissioning			
17	BAT is to prevent pollution upon decommissioning by using necessary techniques as listed in the BATc document.	Celsa has developed a decommissioning process for permitted site operations. In case of decommissioning, the "closure plan" addresses a wide-range of EHS issues addressed with the overall aim of compliance with the *Construction (Design and Management) Regulations 2015* (CDM) and specific conditions related to the baseline Site Condition Report.	BAT
Noise			

BATc Ref.	BATc Requirement	BATc Assessment	Conclusion
18	BAT is to reduce noise emissions from relevant sources in the iron and steel manufacturing processes by using one or more of the techniques (outlined in the BATc document) depending on and according to local conditions.	The site of the proposed development is located due south of the main Celsa steel making operations on the southern side of Rover Way. The closest sensitive noise receptors are located 300 metres north of the site the main Celsa steel making operations *i.e.* Willow High School, 308 metres north northwest (beyond existing steel manufacturing operations), travellers' site, 345 metres north northeast (beyond off-site substation and Welsh Water compound) and a residential area 580 metres north (across open land adjacent to Tesco store). The installation will not operate at night. Noise from process operations is largely controlled through the implementation of operational procedures. In addition, the presence of the New Melt Shop and Old Melt Shop buildings provide a substantial screen between the noise sources and the off-site receptors. Opportunities for improvement to reduce noise are continually considered. Plant is maintained in-line with the manufacture's recommendations and a planned preventative maintenance schedule will be in place. Noise levels are considered when new equipment is purchased. Complaints of noise from the local community are recorded and investigated to try to identify the source of the noise, if noise is attributed to an on-site source then action is taken to rectify the issue. There have been no noise complaints from the local community in relation to previous Rover Way scrap processing operations.	BAT

It is concluded that the proposed slag processing plant meets or exceeds all BAT requirements outlined within BAT conclusions under Directive 2010/75/EU of the European Parliament and of the Council on industrial emissions for iron and steel production.

4 Operations – Asphalt Plant

4.1 Introduction

The proposed asphalt plant to be installed is a Parker StarMix 4000, 320 tonnes per hour (tph) static batch production asphalt plant (**Photograph *4-1***). The asphalt plant operations cover an estimated area 10,022 m^2.

Photograph 4-1: *Parker Plant Limited StarMix Static Asphalt Plant*

The asphalt plant is defined as a stationary technical unit Section 3.5 Part B(e) of *the Environmental Permitting (England and Wales) Regulations 2016* activity *i.e.* coating road stone with tar or bitumen

The plant will be designed and built to meet the most stringent Best Available Technique (BAT) standards as outlined within process guidance note PG3/15(12). Modern asphalt plants are designed and built to ensure that the process flow of hot aggregates going forward from the dryer through screening, weighing and mixing sections are contained within encapsulated dust tight enclosures and maintained under suction from the plant exhaust and collection plant to control emissions at source.

The basic operation of the unit is outlined in **Figure *4-1***.

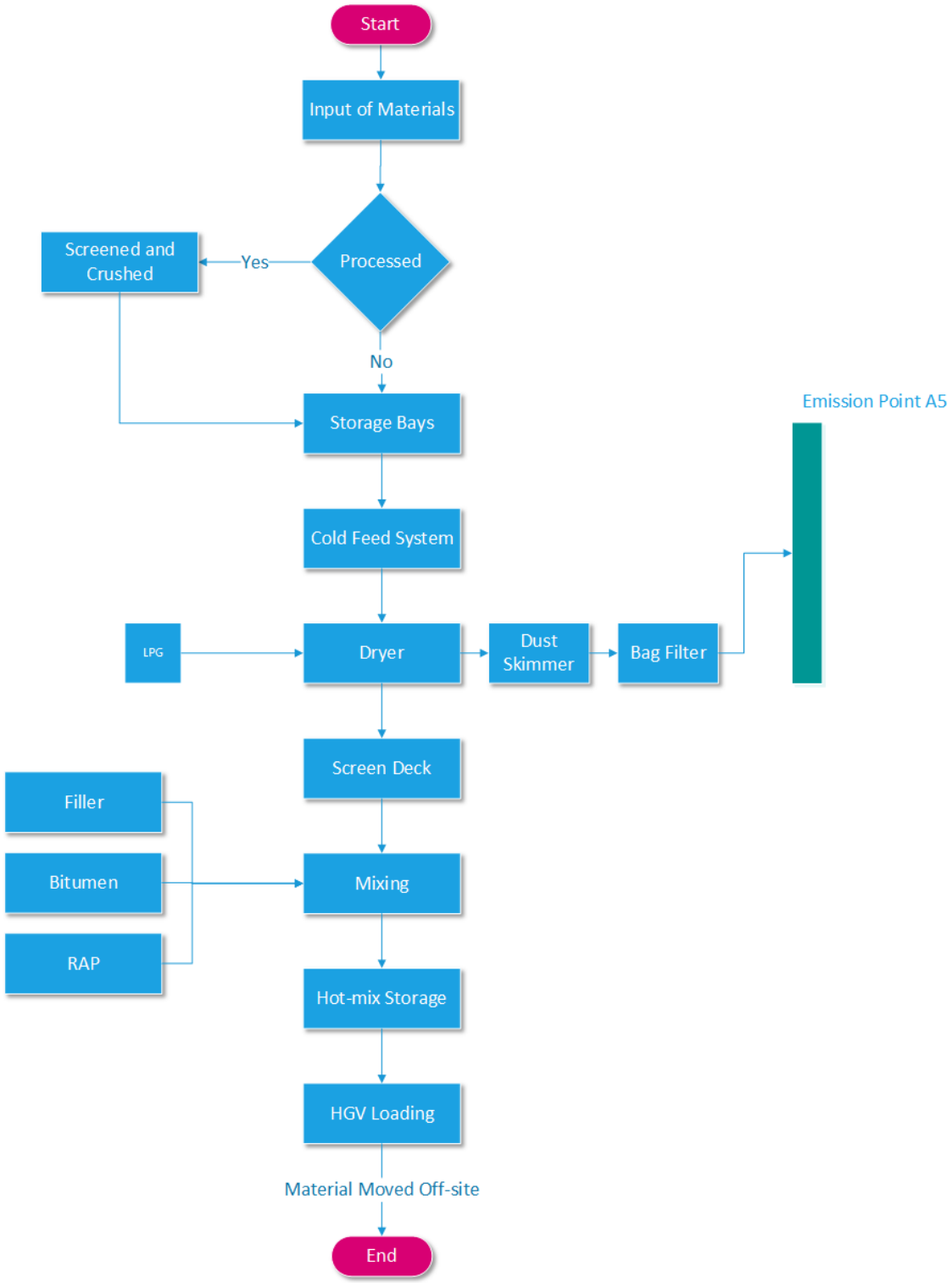


Figure 4-1: *Simplified process flow - Asphalt Plant*

The proposed site layout is outlined within ***Figure 4-2***.

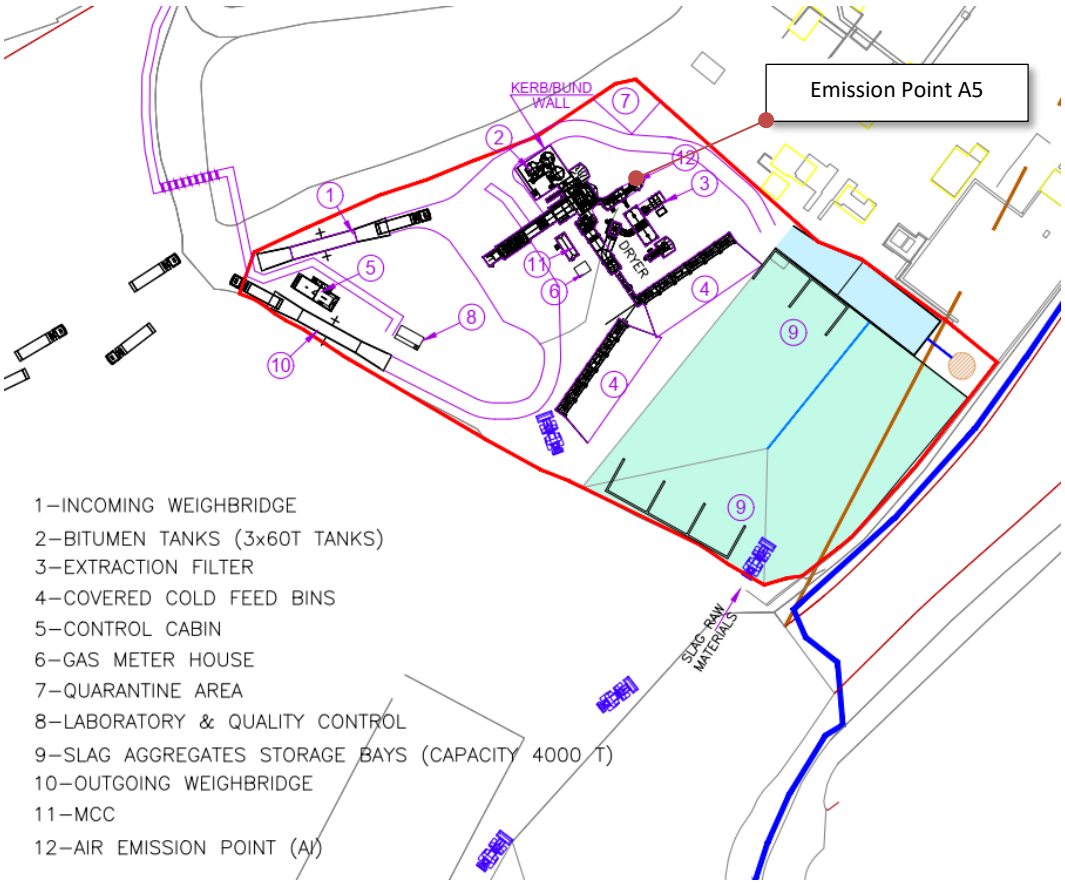


Figure 4-2: *Proposed asphalt site layout*

Harsco (2019). New Asphalt Plants at Celsa Cardiff, Location Plan (Option 7.5), DRG No. 01994-00-01-07.05, Scale 1:1250

4.2 Delivery and Storage of Materials

The asphalt process involves the importation and storage of a range of raw materials, as outlined below.

Aggregate (steel slag)

The crushed and screened steel slag is the principal aggregate used within the SteelPhalt process. The process recovers metal content from the slag (which is re-used within the EAF process) leaving the remaining steel slag as a high-quality aggregate. This material is processed (screened and crushed) and added to the steel slag aggregate stockpiles (recycled base

aggregate) and stored within concrete engineered bays. All materials shall come from the adjacent Celsa operations *i.e.* there will be no third-party sourced materials.

Aggregate (natural)

Other natural aggregates (Limestone) are to be imported to site using HGVs. On arriving at the Site, the incoming materials will be weighed via the incoming weighbridge and then moved to the dedicated concrete engineered bays.

Aggregate (Reclaimed Asphalt Pavement)

Reclaimed Asphalt Pavement (RAP) containing asphalt and aggregates are generated when asphalt pavements are removed for reconstruction, resurfacing, or to obtain access to buried utilities. When properly crushed and screened, RAP consists of high-quality, well-graded aggregates coated with asphalt. On arriving at the site (by HGV), the incoming materials will be weighed via the incoming weighbridge and then moved to the dedicated storage areas prior to processing (screened and crushed) and added to the RAP stockpiles stored within the concrete engineered bays. All materials shall come from locally sourced projects (wherever possible) and, in all cases, from originally supplied Harsco products (*i.e.* no third-party RAP will be processed at the site.

Bitumen

Bitumen (the liquid binder that holds asphalt together) shall be imported by road tanker and stored within one of three heated (maximum of 190 – 200°C) insulated (high thermal efficiency 200 mm thick mineral wool) carbon steel angular plastic-coated profiled above ground storage tanks (60 tonne capacity). Bitumen is stored at temperatures in-line with product specifications and relevant British Standards[5]. To prevent overfilling the site will utilise the industrial standard (Eurobitume UK) delivery permit system[6] and high-level probes and alarms.

Filler

Filler is delivered to site by road tanker. The materials are transferred from the tanker using pneumatic pressure directly into the imported filler storage silo (60 m^3). The asphalt plant also incorporates a 60 m^3 reclaim filler storage silo. Both silos are equipped with level indicators, shut-off valves, vent filters, pressure relief valve and audio and visual alarms.

5 British Standards (2006). BS EN 13108-21:2006. Bituminous mixtures. Material specifications. Factory Production Control

6 https://www.eurobitume.eu/public_downloads/HSE-Documents/EB_UK_Toolbox_Talk_Using_the_Bitumen_Discharge_Permit.pdf

Fibre pellets

Fibre pellets (wood based cellulose fibre wool) are delivered to site by via a bulk tanker and blown directly into a suitably designed storage silo (9-metre-high, 14 tonne capacity) that forms part of the Stone Mastic Asphalt (SMA) fibre pellet additive system. Operational controls shall be employed to ensure that the cellulose pellets are blown into the silo at the rate recommended by the supplier otherwise premature breakdown of the pellets may occur resulting in excessive fines (dust).

Additive

A gravimetric additive system is also incorporated within the plant to feed granulated material from a 30m^3 silo. Each batch of granulate is accurately weighed in a load-cell-mounted weigh hopper before being discharged through a butterfly valve to the mixer.

The liquid bitumen and asphalt additive (Macfix S) would be stored on a standalone IBC portable bunds in-line with the *Control of Pollution (Oil Storage) (Wales) Regulations 2016*.

The material inputs and outputs from the asphalt process are outlined within **Table *4-1***.

Table 4-1: *Material inputs and predicted volumes – asphalt plant*

Source/ Destination	Material	Year 1 (estimated)	Year 5 (predicted)	Vehicle Type
Input- On-site (Celsa)	Unprocessed/ Processed slag	-	-	N/A
Input-Off-site	Bitumen	5,000 t/year	12,500 t/year	30 t arctic tanker
Input-Off-site	Limestone	5,000 t/year	25,000 t/year	30 t arctic rigid tipper
Input-Off-site	RAP	Included in Asphalt Products number (RAP is produced from Harsco returned asphalt).		20 t rigid tipper
Input-Off-site	Filler	1,500 t/year	4,000 t/year	30 t arctic tanker
Input-Off-site	SMA Fibre Pellets	50 t/year	125 t/year	20 t arctic tanker
Input-Off-site	Additive (No. IBCs)	5	5	7.5 t flatbed truck
Output-Off-site	Asphalt Products	100,000	250,000	20 t rigid tipper
Notes:				

Source/ Destination	Material	Year 1 (estimated)	Year 5 (predicted)	Vehicle Type
All estimated/predicted volumes are based on Harsco Metals Group projections.				

Water Use

Water use within the installation is minimal and is used solely for dust suppression purposes. It is anticipated that dust suppression water will either be provided from town's main or (more likely) from the on-site Celsa abstraction (Ref. 21/57/25/78).

Waste

The asphalt plant produces limited waste. The main material received at the installation is the processed weathered slag from the Celsa steel works. The main waste stream(s) that may arise from the operation of the plant is during maintenance activities. The wastes are managed in accordance with the Company waste management procedure.

4.3 Initial storage and loading

Five large, specially constructed covered concrete storage bays accommodate the bulk storage of materials for the plant:

- EAF slag (-4 mm fine grade);
- EAF slag (6 mm slag chippings);
- Limestone (-4 mm fine grade);
- Limestone (6mm chippings); and
- Sand.

The remaining EAF and limestone chipping stock does not need to be stored in covered bays so will be placed adjacent to the storage bays.

In the first instance the materials are moved using a loading shovel up a small ramp into the cold-feed system comprising an arrangement of two separate banks of in-line bins (hoppers) set at right angles to each other (**Photograph *4-2***).

Photograph 4-2: *Typical aggregate cold feed unit*

One bank consists of six hoppers for sized (processed) slag materials, together with one 18m^3 unit for granulated asphalt (RAP). On the aggregate side, two of the six hoppers are for sand and are equipped with hopper-wall vibrators to ease material flow. Apart from the granulated asphalt bin, all the hoppers are 18m^3 capacity and each one is fitted with a frequency-controlled belt feeder for accurate blending. In addition, all the hoppers are sheeted on their sides, ends and roofs for protection from the elements (wind whipping) and to minimise dust emissions. The surrounding yard and handling areas shall be fitted with dust suppression sprays and utilised (as required) to reduce dust emissions from the site.

All movements from the storage bays to the cold feed bins shall be undertaken using a small wheel loader (*e.g.* Cat 938). All refuelling of vehicles and plant will be undertaken using existing refuelling stations that form part of the existing permit.

4.4 Drying of Materials

A long collecting conveyor (800 mm wide) transfers material on to an inclined dryer feed conveyor which feeds material directly into the aggregate rotary dryer drum (2.8 m diameter x 10 m long) (**Photograph *4-3***).

Photograph 4-3: *Typical aggregate dryer*

The dryer drum is supported and driven by 4 x 30 kW geared drive units and can process a maximum of 340 tonnes/hour. Nylon support and thrust rollers are used to reduce wear and to minimise noise and vibration. The dryer is fully lagged with Rockwool insulation and aluminium clad for heat retention and noise reduction. The dryer is enclosed by a 2m high safety fence fitted with an electrically interlocked access gate.

The purpose of the drying drum is to dry and heat the aggregates by tumbling them through hot air. It is important to dry the materials as inconsistent water content can, if not adequately controlled significant impact the quality of the final asphalt.

The dryer plant is fired with natural gas. It is equipped with a full range of operating and safety devices to deliver high-efficiency fuel usage, while an air-inlet silencer is connected to the burner to suppress noise levels. Although the dryer can be dual-fuelled it is not proposed to install a secondary diesel fuel back-up system.

The water vapour generated from the drying process is removed from the drying drum and, once it has been passed through a series of filters, it is removed and emitted from the asphalt plant via the main stack **(Emission point Ref: A5)**.

Aggregates contain fine particles and it is essential that these components are removed so that a correct weight of single sized aggregates can be calculated for each part of the asphalt mix. The fine particulate within the drying drum is extracted and filtered, prior to storage within the reclaimed filler silo. Dust collection from the dryer is via a primary system (skimmer) and secondary system (bag filter) with a capacity of 118,825 m^3/h. The outlet from the bag filter unit discharges to a stack 22 metres in height **(Emission point Ref: A5)**.

The skimmer system (**Figure *4-3***) is designed to remove coarse dust between 75 and 200 µm with the collected particulates reintroduced into the mix whilst ensuring that wear to the exhaust ducting and secondary stage filter is minimized.

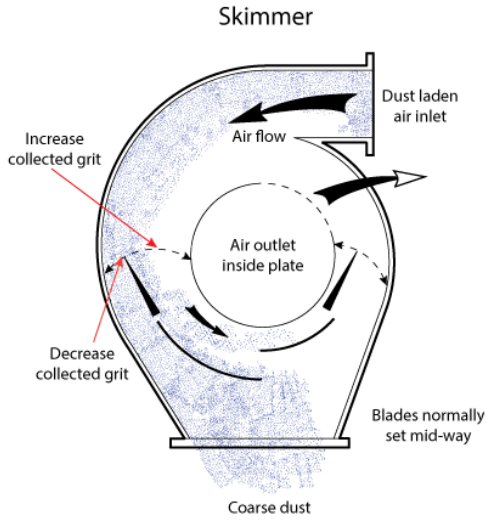


Figure 4-3: *Primary dust control system (skimmer)*

https://www.parkerplant.com/asphalt/ancillary/dust-filters

The secondary bag filter systems are guaranteed to deliver dust emission levels of less than 20 mg/m³. Reverse air cleaning of the high temperature resistant bags eliminates the need for a high-pressure cleaning system and as such the operational life of the filter bags is extended. The filter medium is Aramid 400 g/m^2 (560 double bags) with a filter area of 1,372 m^2 and a filtration velocity of 1.44 m/min.

The modular static bag filter will collect and transfer (via screw conveyors, to a filler elevator). the <75 µm reclaimed dust for use as reclaimed filler material within the asphalt plant or allow for separate dust disposal.

Dust is also collected from nuisance points at the screen, weigh hoppers and elevator. An in-line dust monitor (particle impingement type) mounted within the exhaust stack **(Emission point Ref: A5)** provides a remote readout in the control room that forms part of the Particulate and Compliance Emission Monitoring (PCME) system.

Figure 4-4: *Secondary dust collection system (bag filter)*

https://www.parkerplant.com/asphalt/ancillary/dust-filters

Any excess dust collected can be discharged from the reclaimed dust silo, through a rotary valve, into a twin-shaft paddle conditioner, where water is introduced (from a 2,250-litre tank) to provide an environmentally friendly method of purging the reclaimed dust. This action "kneads" the dust for maximum exposure of dust to water. The action of the mixing paddles moves the wetted ash from the inlet area to the outlet end of the chamber. The uniformly wet material is discharged through a chute at the bottom of the chamber via a 3 m high and 3.5 m wide structure providing clearance for vehicle access.

4.5 Screening and Mixing

Having been heated and dried, the mixture is then transferred, via a (fully enclosed) bucket elevator (maximum 340 tonnes/hr) to a screen deck, housed at the top of the main structure of the asphalt plant. The decks on the StarMix 4000 are 4 m long x 2.6 m wide with 6 individual screens featuring two 18.5 kW low-maintenance vibrating motors. The drive units are

mounted outside the screen housing to allow for high-temperature screening of materials. Wide access doors, together with a roll-away chute, provide access to all screen decks. An extraction fan ensures negative pressure is maintained within the screen housing for optimum dust control.

At this stage, oversize materials are removed from the heated mixture and re-used and the product (within specification) is transferred to a 5 hot storage bins beneath the screen deck. All the bins are insulated and clad and each one is fitted with continuous level indicators and an overflow chute. Discharge is by means of a pneumatically operated radial door, which accurately regulates material flow to the aggregate weigh hopper, from where the slag/aggregates are discharged directly into the mixer.

The next stage of the asphalt production process is the mixing stage. Each of the hot bins releases a certain amount of aggregate into the weigh hopper. Accurate weighing out of ingredients is achieved by separate load-cell-mounted weigh hoppers *i.e.* a 4,250 kg capacity hopper for slag/aggregate, a 900 kg filler weigh hopper, and a 650 kg bitumen hopper.

This is then discharged into the paddle mixing drum beneath. Rapid and thorough mixing takes place in the plant's insulated, 4,250 kg capacity, twin-shaft paddle mixer, with drive provided by two 45 kW geared motor units through synchronized gears. Once in the mixing drum, filler is added back into the mix and then binder is added. Temperatures of the mixer are transmitted to the Real-Time-System (RTS) and monitored within the control room. Ducting extracts particulate laden air from the mixer to the secondary dust collection system (bag filter unit).

Bitumen is added from the three bitumen storage tanks depending upon the required mix. The bitumen comes in different penetration (pen) grade grades which have different characteristics (hardness) which influence the workability of hot asphalt and the stiffness of the asphalt when cooled.

A covered RAP conveyor transports RAP to the mixer via a belt weigher to give accurate proportional blending. The addition of RAP bypasses the heating systems on the asphalt plant and is fed directly into the finished product mixer so there is no risk of fume or fume release.

A radiation pyrometer is situated at the mixer discharge to indicate mix temperature, and a flux-oil metering system with spray bars is fitted to allow the dosing of non-flammable additives into the mix.

Having been mixed the asphalt must be kept in an insulated hopper (200 tonne split 90/110 tonne) to avoid setting before it is loaded into HGVs. When an HGV is correctly positioned beneath the hot-mix storage system, the correct material is weighed and discharged into the

vehicle which, in turn, is weighed on the outgoing weighbridge and then it is dispatched from the site.

4.6 Control Systems

The control room for the plant is in a 6 m long x 2.4 m wide corrugated sheet steel clad container style building. It contains a computer mimic diagram, key switch for manual/auto control, manual start/stop buttons, cold feed control, burner control, PLC weigh/mix control system and PCME system.

4.7 Slag Quality Protocol

In-line with current NRW guidance[7] aggregate product made from waste steel slag will be regarded as fully recovered and no longer subject to waste controls (meets 'end of waste status') providing the following can be demonstrated:

- use of only the correct waste steel slag materials;
- made only using the permitted products;
- complies with the relevant European standard, specification and quality controls for the product you are making, and it passes all required tests and needs no further treatment, weathering or size reduction before use;
- have a manual of your factory production control (FPC);
- have marked the product to the CE requirements of the Construction Products Regulations;
- transported, stored, handled and processed the waste steel slag and the final product following good practice guidelines; and
- supplied the customer with delivery documents confirming the product meets the quality protocol.

Harsco currently hold a valid Certificate of Conformity of Factory Production Control issued by Lloyd's Register on 17 May 2013 (Certificate No. 0038/CPR/LRQ00000492) for their Rotherham plant. The same process will be applied and adapted for use at the Cardiff facility.

7 https://www.gov.uk/government/publications/aggregate-from-waste-steel-slag-quality-protocol/aggregate-from-waste-steel-slag-quality-protocol

4.8 BAT Assessment

'Best available techniques' (BAT) means the available techniques which are the best for preventing or minimising emissions and impacts on the environment. 'Techniques' include both the technology used and the way your installation is designed, built, maintained, operated and decommissioned.

The European Commission produces BAT reference documents or BREF notes for more significant activities that are regulated in the UK as Part A(1) processes. As asphalt processes are regulated as Part B activities the BAT requirements are outlined within specific Process Guidance Notes and in the case of this plant PG3/15(12) Statutory guidance for roadstone coating (Defra, September 2012). An assessment, against the PG3/15(12) requirements, is outlined within **Table *4-2***.

Not applicable requirements are outlined below:

- PG3/15(12) Ref. 5.1 – 5.2: Response not required.
- PG3/15(12) Ref. 5.3 – 5.5: General description of process (not specific requirement)
- PG3/15(12) Ref 5.15: Only applies to mobile plant.
- PG3/15(12) Ref. 5.22: The site will not process third-party Road Asphalt Planings (RAP). However, the plant will re-process asphalt material originally produced by Harsco that is out of specification or has been returned. Harsco does not use coal tar in the asphalt making process and will not process third-party materials.
- PG3/15(12) Ref. 5.24: Not applicable to the proposed operations.
- PG3/15(12) Ref. 5.30: Not applicable to the proposed operations.
- PG3/15(12) Ref. 5.31: Not applicable to this operation, no rail transportation proposed.
- PG3/15(12) Ref. 5.38: Not applicable to the proposed operations.
- PG3/15(12) Ref. 5.41: Not applicable to the proposed operations, wet arrestment is not used as abatement.

Table 4-2: *Asphalt Plant BAT Assessment*

Ref.	BAT Requirement	BAT Assessment	Conclusion
Silos			
5.6	If the silo becomes pressurised the pressure relief valve should lift for safety reasons. If the pressure relief valve is not designed to relieve the pressure quickly enough, the silo may rupture, or the filter unit may be ejected from the top of the silo. Such incidents give rise to an unacceptable emission to atmosphere. Such incidents have been caused by excessive pressure being blown from the delivery tanker into the silo at the end of the delivery cycle. Venting the residual air from a tanker should be via a flow restrictor, which limits the rate at which the air is discharged, if it must be discharged through the silo. Rather than venting through the silo, it is preferable that residual air should be vented to atmosphere using a filtered vent on the tanker.	Imported dust silo is fitted with a proprietary Spring-loaded Pressure Relief Valve. Reclaimed dust silo pressure is relieved via sealed ductwork system connected into the main bag filter.	BAT
5.7	All new silos should be installed with automatic protection systems to control the delivery of material from the tanker to the silo such that it is not possible to over-fill or over-pressurise the silo.	Imported dust silo is fitted with a proprietary Spring-loaded Pressure Relief Valve and a proprietary high-level paddle type switch triggering automatic delivery cut-off via closure of a butterfly valve mounted in the silo fill pipe when high level is reached. Reclaimed dust silo pressure is relieved via sealed ductwork system connected into the main bag filter. It is fitted with a proprietary high-level paddle type switch triggering automatic delivery cut off via shutdown of the plant's pneumatic conveyor blower when high level is reached.	BAT

Ref.	BAT Requirement	BAT Assessment	Conclusion
5.8	If the filter system on the silo is not capable of handling the large flow of air that is generated during the delivery process, this may cause an increase in pressure within the silo. Filter manufacturers supply information on the pressure drop across filters and the filtration rate. It is important that the filter size is calculated to match the flow rates of air through the silo. The filter systems must be cleaned to prevent blockages and accumulation of powder in the filter system.	The imported filler silo is fitted with audio and visual alarms. The Fibre pellet silo is fitted with a high-level alarm. All aspects of the plant including filters shall be checked for maintenance requirements on a planned basis and in accordance with the preventative maintenance schedule.	BAT
5.9	The silo management system includes the high-level alarms, arrestment plant and pressure relief device. If best practice is being applied, then any failure of the silo management system leads to full investigation of the operation of the plant and equipment. Continuous high-level monitoring systems are currently available for use in storage silos. They may be used telemetrically to monitor stock within the silo. They may also be used to automatically stop delivery of material to the silo. It is expected that such systems will become more widely used in the future.	Alarm and stop features as described above in 5.8 & 5.9. Any failure of the system shall be reported to the site manager who will be responsible for investigating the cause and implementing any necessary remedial action. The results of inspections and remedial measures taken will be recorded in the Action Capture System.	BAT

Ref.	BAT Requirement	BAT Assessment	Conclusion
5.10	Careful delivery by trained personnel will avoid materials being blown into silos at a rate which is likely to result in pressurisation of the silo, especially towards the end of the delivery when the quantity of material entering the ducting is reduced. If deliveries are accepted from tankers without on board relief valve and filtration systems, particular care to avoid pressurisation of silos when venting air through the silo at the end of the delivery is needed.	All tanker deliveries will be from an approved supplier with fully trained staff and suitable method statements and risk assessments for the task. All deliveries will be supervised.	BAT

Ref.	BAT Requirement	BAT Assessment	Conclusion
5.11	The following measures (*please refer to PG3/15(12) 5.11 for full list*) relating to arrestment plant on silos and other silo management techniques are only applicable where the silo vents to the external environment or where silo emissions may escape from inside a building into the external environment.	Fine material such as imported and reclaimed filler will be stored in dedicated silos to minimise the rise of particulate emissions. The plant will also include a series of purpose-built storage bays comprising 3 walls and a roof. Imported dust silo is fitted with a proprietary Spring-loaded Pressure Relief Valve and a proprietary high-level paddle type switch triggering automatic delivery cut-off via closure of a butterfly valve mounted in the silo fill pipe when high level is reached. Reclaimed dust silo pressure is relieved via sealed ductwork system connected into the main bag filter. It is fitted with a proprietary high-level paddle type switch triggering automatic delivery cut off via shutdown of the plant's pneumatic conveyor blower when high level is reached. Silos are also fitted with alarms and a high/low panel at delivery point. Alarms and pressure release mechanisms will be checked on a weekly basis and included as part of the preventative maintenance programme. Tanker drivers must follow specific unloading procedures. Any issues must be reported, and the delivery must cease until issues have been rectified. If emissions are visible deliveries will cease Any problem that is observed shall be reported to the site manager who will be responsible for investigating the cause and implementing any necessary remedial action. The results of inspections and remedial measures taken will be recorded in the Action Capture System.	BAT
Aggregate storage (non- mobile plant)			

Ref.	BAT Requirement	BAT Assessment	Conclusion
5.12	In areas where aggregate is being offloaded appropriate dust control measures may include the following: • enclosure fitted with extract ventilation to arrestment plant; • enclosure fitted with water sprinklers. • For new processes, where the plant is at a quarry, it should be fed with stone directly by conveyor from storage hoppers, bays or covered stores, except for material imported onto site which may be fed from re-feed hoppers. • For existing processes where plant is at a quarry, storage of stone should comply with the paragraph below on open storage and all feed hoppers should be located within a structure consisting of at least 3 walls and a roof.	The aggregate hoper is fitted with dust sealing comprising high temperature resistant rubber. The plant will have a series of covered bays (3 x walls and roof). Where material is stored in the open, stockpiles will be kept to a minimum and compliance will be as described in Section 5.14. A bowser and fixed water suppression systems will be available on site.	BAT

Ref.	BAT Requirement	BAT Assessment	Conclusion
5.13	For plants that are not situated at a quarry authorised in its own right (for example, satellite depots and plant at sand and gravel pits) the following provisions should apply: For new plant supplied mainly by road, the day to day stocks of materials, except sand or washed product, should be held in storage bays within a structure consisting of at least three walls and a roof, and of sufficient capacity to enable normal daily requirements to be met without recourse to the use of externally stored material. Stocks in excess of this provision may be stored in the open so as to comply with the provisions of the paragraphs on 'open storage' and 'aggregate storage (mobile plant)'. All feed hoppers should be located within a structure consisting of at least three walls and a roof. For existing plant, and for new plant supplied mainly by rail or ship, storage of stone should comply with paragraph on 'open storage' and all feed hoppers should be located within a structure consisting of at least 3 walls and a roof.	The plant will have a series of covered bays (3 x walls and roof). Where material is stored in the open, stockpiles will be kept to a minimum and compliance will be as described in Section 5.14. The aggregate hoper is fitted with dust sealing comprising high temperature resistant rubber.	BAT
Open Storage			

Ref.	BAT Requirement	BAT Assessment	Conclusion
5.14	No material should be stored in the open except for: • material that has been screened to remove material 3 mm and under; • sand; • scalpings; • material used for road sub-bases (commonly known as "MOT material") that has been conditioned before deposition; • crusher run material or blended material that has been conditioned before deposition; • material under 3 mm that is in excess of the internal storage capacity (the internal storage capacity should be approved by the local enforcing authority). Where the only practicable option for the storage of material under 3 mm is external stockpiles, particularly careful consideration should be given to the measures discussed below.	Fine material such as imported and reclaimed filler will be stored in dedicated silos, to minimise the rise of particulate emissions. The plant will include a series of purpose-built storage bays comprising 3 walls and a roof. Any external stockpiles will be kept to a minimum and predominantly comprise of the larger sized aggregate type material. This material has a residual moisture content of circa 3% which reduces the likelihood of dust emissions. Stock levels are closely monitored, and material can be ordered 'as required'. Harsco will maintain constant communication with the customer regarding stock. All stockpiles will be controlled in accordance with procedures and the site 'Particulate Matter Management and Monitoring Plan'. Please refer to Sections 5.16 & 5.17 of this document for further detail regarding stockpile compliance.	BAT
Stockpile and ground storage			

Ref.	BAT Requirement	BAT Assessment	Conclusion
5.16	Consideration should be given to the siting of stockpiles, based upon such factors as the prevailing winds, sheltered positions, proximity of neighbours and site operations. A method of stockpiling should be employed which minimises dust emissions, *e.g.* profiling. Minimisation of drop height is very important in stockpiling to reduce wind whipping of particulates. Loading to and from stockpiles should be carried out in such a manner as to minimise wind-borne dust *e.g.* taking place at sheltered points.	Work Instruction: 'Particulate Matter Management and Monitoring Plan'. All stockpiles shall be kept to minimum. Operator training includes the requirement to pay attention when moving material in order to prevent unnecessary dust emissions. Stockpile tops are flattened, rather than a pyramid to reduce the effect of wind erosion across the stockpiles. Drop height of material transfer points and disturbance of stockpiles shall be minimised. During dry weather the bowser will be deployed on haul roads and water suppression will be utilised storage and loading/unloading areas as necessary. Operations with the potential to generate particulates shall be ceased during high winds particularly when the prevailing wind direction is towards potentially sensitive receptors.	BAT
5.17	When necessary to control dust emissions from stockpiles, methods such as limiting the height of stockpiles or using dust suppressants may be used. Other possible controls include wind breaks on stock piles, bunding or fencing around the pile and strategic arrangement of stockpiles. Periodic conditioning with water, according to weather conditions, may be an appropriate measure. Installation of fixed water sprays should be considered for long term stocking areas if appropriate.	Please refer to Ref. 5.16 above.	BAT
Conveying			

Ref.	BAT Requirement	BAT Assessment	Conclusion
5.18	There are various ways of keeping conveyor belts and the surrounding areas clean. For example, where chevron belts are used, catch plates may be fitted to contain dust falling from the underside of the belt at the turning point. From a health and safety perspective this is not always possible, and hoses and sprinklers is a possible alternative. New conveyors can be designed to minimise free fall at discharge points. A chute, or similar equipment, at the point of discharge from a conveyor reduces dust arising. Arrestment plant might be a suitable control option if dusty emissions arise from conveyor transfer points. The conditions relating to conveyors should not be applied where material has been screened to remove particles under 3 mm in size, unless visible dust emissions have been observed from the conveyors. The following conditions (*please refer to PG3/15(12) 5.11 for full list*) should only be applied where emissions to the external environment are likely to arise.	The plant is fitted with a 'Reclaimed Dust Elevator' which conveys reclaimed dust from the bag filter transfer screw conveyor to a silo. It is fully enclosed and discharges via a chute to reclaimed filler silo. Work Instruction in place for Cleaning Conveyors/Tail Drums/Head Drums. All fixed plant is required to have a preventative maintenance programme in place in accordance with EM-P-014 Maintenance Procedure, maintenance programme will include conveyors.	BAT
Process Operations			

Ref.	BAT Requirement	BAT Assessment	Conclusion
5.19	Emissions from the process operations covered by this note comprise fine particulate matter, in the form of dust, the products of combustion and odour. The control of dust emissions from these processes is mainly by the use of enclosures and extraction to particulate arrestment plant. Internal transport of dusty materials should be carried out so as to prevent or minimise airborne dust emissions, as this then reduces the potential for fugitive emissions. All hot storage bins should have level indication and any overflow chutes should have dust arrestment facilities fed into the main dust arrestment system. Equipment for the crushing, grinding and screening of minerals should be fitted with dust extraction which is vented to air through arrestment plant. Plant should be designed and operated so that emission of dust during the discharge of surplus dried stone or filler is minimised.	Aggregate weigh hopper is sealed with temperature resistant rubber. Screen is totally enclosed in a fabricated steel enclosure with removable panels. Staged dust collection system • Primary inertial skimmer separator and hopper. Outlet continuously discharging coarse dust into elevator feed boot via 7.5 kw inclined screw conveyor and gravity flap valve. • Reverse air cleaning type bag filter. Less than 20 mg/m^3 provided the filter is maintained in accordance with operating instructions Temperature probes fitted in duct prior to filter to protect bags from high gas temperatures. Vacuum gauge provided to indicate pressure drop across the bag filter and control the filter cleaning system. Dust is minimised not only for environmental reasons but also due to cost implications. Continuous monitoring system for particulate emissions will be implemented.	BAT
Bitumen Handling			

Ref.	BAT Requirement	BAT Assessment	Conclusion
5.20	In order to minimise emissions of fume and the associated odour, all bitumen and synthetic binder should be stored and handled within the appropriate temperature range for its grade. Details of suitable storage and handling temperatures are given in Appendix 1 of PG3/15(12), The temperature gauge on all hot binder storage tanks should be displayed. A high temperature trip device, to prevent the binder overheating, should be operational at all times. Where practicable in relation to the viscosity and temperature of material being handled, bulk bitumen and tar storage tanks should be fitted with a high-level alarm or volume indicator to warn of overfilling. Where the fitting of such devices is not practicable, procedures to prevent overfilling should be agreed with the regulator.	Digital bitumen temperature controller with PT100 input and 4-20 mA re-transmission output. High temperature filled system thermostat with a range of 120-215°C Control panel mounted contents display and controller with high level warning activation. Contents panel mounted at tank fill point containing contents gauge, low level lamp indication, high level siren and beacon and ultimate high-level siren and beacon.	BAT
Bitumen			

Ref.	BAT Requirement	BAT Assessment	Conclusion
5.21	Where plant is situated close to populated areas, and particularly when tar is used as a binder, it may be necessary to abate emissions of binder fume to prevent odour problems during delivery. The following options may be useful and should be considered in such circumstances: • fume arising from storage tank vents may be ducted to the drier burner provided it is in operation; this should combust any odour arising • emissions of bitumen fume from deliveries can be reduced by fitting ground-based pumps • where lorry-based compressors are used to discharge the delivery, emissions of odour and fume can be reduced; • one procedure which can be used in some cases, when clearing hose and lines, is to use two short bursts of air rather than one long one. The procedure to be used should be agreed by the regulator • bitumen from some sources is more odorous than from others • some additives are available which are designed to reduce the odour of bitumen	The plant will not be located within proximity of residential areas and tar is not used as a binder. A bitumen discharge permit must be completed before any delivery of bitumen is accepted. Delivery drivers must follow procedure. Plant is fitted with One pneumatically operated three-way trans-flow valves complete with actuator to provide low level ring main for delivery and return to tanks. Daily olfactory checks will be undertaken to monitor weather conditions and any potential odour issues. Bitumen will be sourced from an approved supplier along with the corresponding MSDS. Bitumen used at Harsco's corresponding asphalt in Rotherham has not presented any odour issues and additives have not been required.	BAT
Techniques to Control Fugitive Emissions			

Ref.	BAT Requirement	BAT Assessment	Conclusion
5.23	Fugitive dust emissions should be prevented whenever practicable. When this is not practicable emissions should be controlled at source by measures agreed between the regulator and the operator. Examples include correct storage of raw materials, organising the process in such a way that spillage is avoided, and maintaining high standards of internal and external housekeeping. Where water is used as a method of dust suppression, processes should have an adequate supply of water and all water suppression systems should have adequate frost protection. To make buildings as dust tight as necessary to prevent visible emissions, self-closing doors and close-fitting entries and exits for conveyors are among the options that may be used. Attention should be paid to preventing and cleaning up deposits of dust on external support structures and roofs, in order to minimise wind entrainment of deposited dust. If necessary, emissions should be controlled and abated using suitable arrestment equipment.	Specific Particulate Matter Management and Monitoring Plan Work Instruction and Associated Action Plan to be implemented to control the risk of fugitive dust emissions. An adequate supply of water for fixed and mobile dust suppression will be available on site. The screen is totally enclosed in a fabricated steel enclosure with removable panels. Sections of the plants are fitted with High temperature resistant rubber, and extra sheeting to reduce the risk of fugitive dust emissions. All fixed plant is required to have a preventative maintenance programme in place in accordance with EM-P-014 Maintenance Procedure. Pre-start/shift checks are also required. Work Instruction in place for Cleaning Conveyors/Tail Drums/Head Drums. The plant is externally clad with steel which is easily cleaned. Ducting feeds back to the main arrestment system Dusty waste such as imported filler and reclaimed filler are stored in silos. Any spillages are to be cleaned up immediately in accordance with procedure. The daily check system includes spillages and general housekeeping A wet scrubber is not used.	BAT
Site			

Ref.	BAT Requirement	BAT Assessment	Conclusion
5.25	Loading and unloading of product for transport by road, rail or sea should be carried out so as to minimise the generation of airborne dust.	Loading/Unloading to be undertaken in accordance with procedures. Operator training includes the requirement to pay attention when moving material in order to prevent unnecessary dust emissions. Drop heights will be kept to minimum, material will be dampened down where required. Weather conditions will be monitored in addition to visual checks for dust/emissions.	BAT
5.26	Tankers carrying dusty materials should discharge only into silos fitted with an effective dust collecting system.	Fine material such as limestone filler will be delivered into a purpose-built silo.	BAT
5.27	Internal road transport of processed materials likely to generate dust should be carried out in closed tankers or sheeted vehicles, or the materials conditioned with water.	Where material (*e.g.* Limestone) is transported on public roads it will be by sheeted vehicles / closed tankers. Some material will be transported internally on site via open dumper truck. However, this material has a residual moisture content and therefore is not anticipated to give rise to fugitive dust emissions. Water and equipment will be available on site for dampening down/dust suppression purposes during loading/unloading. Internal access/haul roads will be hard-surfaced with asphalt and speed limits imposed to minimise emissions.	BAT
Loading, Unloading and Transport			

Ref.	BAT Requirement	BAT Assessment	Conclusion
5.28	Effective dust control measures are required for all vehicles arriving at or leaving the site where the load may give rise to dust in transportation, bearing in mind that emissions from moving vehicles may give rise to a significant problem. Such controls should not normally be required for the transportation of designated material which is above 75mm, as these materials are unlikely to give rise to dust emissions.	Where material (*e.g.* Limestone) is transported on public roads it will be by sheeted vehicles/closed tankers. Some material will be transported internally on site via open dumper truck. However, this material has a residual moisture content and therefore is not anticipated to give rise to fugitive dust emissions. Water and equipment will be available on site for dampening down/dust suppression purposes during loading/unloading. Internal access roads will be surfaced with asphalt and speed restrictions will be implemented to minimise the risk of dust lift off. A bowser will also be deployed for dampening down.	BAT
Road			
5.29	Sheeting is the usual technique required to prevent dust emissions from road vehicles. Where stone is loaded or unloaded, dust emissions should be minimised by water suppression or by local dust extraction.	Controls as stated in Ref. 5.28.	BAT
5.31	Where specific techniques are referred to below the regulator should agree an alternative method provided it is demonstrated to achieve an equivalent level of control. Where road vehicles are used to transport potentially dusty materials, they should be sheeted or otherwise totally enclosed as soon as possible after loading and before leaving the site.	Where material (*e.g.* Limestone) is transported on public roads it will be by sheeted vehicles / closed tankers. Some material will be transported internally on site via open dumper. However, this material has a residual moisture content and therefore is not anticipated to give rise to fugitive dust emissions.	BAT
Roadways and transportation			

Ref.	BAT Requirement	BAT Assessment	Conclusion
5.32	In designing a new process, minimising vehicle movement in the site layout will enable better control of roadways with the potential for fugitive emissions.	Vehicle access, movements to and from site and loading/ unloading will be considered in the overall design and layout of the plant, with the aim of reducing movements and minimising any risk of queuing vehicles wherever possible.	BAT
5.33	Vehicle exhausts directed above the horizontal are preferred as these avoid the impact of the exhaust raising dust when travelling on internal roadways.	Internal roadways will be hard surfaced with asphalt, speed limits enforced, and bowser deployed in dry weather. Harsco's own fleet vehicles will be fitted with horizontal exhausts.	BAT

Ref.	BAT Requirement	BAT Assessment	Conclusion
5.34	On some sites wheel-cleaning facilities may be useful to prevent dust being carried off the site. Where the plant is co-located with a quarry which has wheel wash available, these might be used where necessary. If a plant is co-located with a quarry which does not have wheel-wash facilities, it may not be appropriate to install them. Vehicles may also be effectively cleaned, prior to leaving site, with a brush and hose. Sometimes the presence of a long access road ensures that any dust falls off the vehicles and does not reach the public highway. Hard surfacing for roadways should normally comprise compacted stone chippings between the loading points and the wheel wash (where present), and macadam or concrete for the final section of road leading to the public highway. Sweeping, wetting or sealing are all techniques that may be used to reduce dust emissions from roads. The technique that should be used depends upon the type of road under consideration. Roadways in normal use and any other area where there is regular movement of vehicles should have a hard surface capable of being cleaned or kept wet. They should be kept clean or wet, in order to prevent or minimise dust emissions. They should be adequately drained to avoid ponding of water. They should be kept in good repair.	Access/haul roads will be hard-surfaced with asphalt. Speed limits will be imposed to reduce the risk of any dirt/dust becoming airborne and causing a nuisance. As part of the civils work for the plant, site drainage will be considered and upgraded as required to reduce the risk of ponding/standing water. Internal roads and the general site surface will be regularity inspected and included in the site maintenance programme. A water bowser and supplies of water will be readily available on site to dampen down the site surface and access roads. Given the above controls and specific nature of the site there are no plans to install a wheel-wash at this present time, however, the situation will be monitored and reviewed as necessary.	BAT
Air Quality – Dispersion and Dilution			

Ref.	BAT Requirement	BAT Assessment	Conclusion
5.35	Pollutants that are emitted via a stack require sufficient dispersion and dilution in the atmosphere to ensure that they ground at concentrations that are deemed harmless. This is the basis upon which stack heights are calculated using HMIP Technical Guidance Note (Dispersion) D1. The stack height so obtained is adjusted to take into account local meteorological data, local topography, nearby emissions and the influence of plant structure. The calculation procedure of D1 is usually used to calculate the required stack height but alternative dispersion models may be used in agreement with the regulator. An operator may choose to meet tighter emission limits in order to reduce the required stack height.	The stack is 22 m high and 1.5 m in diameter. Stack emissions are restricted to process steam and particulates from the drying process. Therefore, as per Ref. 5.36 below, provisions relating to stack height calculation for the purpose of dispersion and dilution are not considered necessary. However, the results of the H1 assessment are as follows: • The PM10 (annual mean) is screened out at stage one as the Process Contribution is >1% of the Environmental Assessment Level (EAL). • The PM2.5 (annual mean) is screened out at stage two as the Predicted Environmental Concentration (PEC) <70%. • The PM10 (24 hour mean) is screened out at stage two as the short-term Process Contribution (PC) is less than 20% of the short-term environmental standards minus twice the long-term background concentration As all emissions are screened out detailed modelling is not considered necessary. The site is not located within an Air Quality Management Area (AQMA). Emissions will be continuously monitored, and the plant is designed to achieve a particulates emission standard of 20 mg/m^3 which is significantly lower than the PGN level of 50 mg/m^3.	BAT

Ref.	BAT Requirement	BAT Assessment	Conclusion
5.36	Where an emission consists purely of air and particulate matter, (*i.e.* no products of combustion or any other gaseous pollutants are emitted) the above provisions relating to stack height calculation for the purpose of dispersion and dilution should not normally be applied. Revised stack height calculations should not be required as a result of publication of this revision of the PG note, unless it is considered necessary because of a breach or serious risk of breach of an EC Directive limit value or because it is clear from the detailed review and assessment work that the permitted process itself is a significant contributor to the problem. Where offensive odour is likely outside the process site boundary the assessment of stack or vent height should take into account the need to render harmless residual offensive odour.	Please refer to Ref. 5.35 above. With regards to odour, the bitumen used does not contain tar and odour off site is considered unlikely. However, odour monitoring will be undertaken as part of the routine olfactory checks.	BAT
Ambient Air Quality Management			

Ref.	BAT Requirement	BAT Assessment	Conclusion
5.37	In areas where air quality standards or objectives are being breached or are in serious risk of breach and it is clear from the detailed review and assessment work under Local Air Quality Management that the permitted process itself is a significant contributor to the problem, it may be necessary to impose tighter emission limits or, in the case of this particular note, additional limits for pollutants not listed in table 4.1, such as NOx. If the standard that is in danger of being exceeded is not an EC Directive requirement, then industry is not expected to go beyond BAT to meet it. Decisions should be taken in the context of a local authority's Local Air Quality Management action plan.	Emissions will be continuously monitored, and the plant is designed to achieve a particulates emission standard of 20 mg/m^3 which is significantly lower than the PGN level of 50 mg/m^3. The site is not located within an Air Quality Management Area (AQMA). Therefore, it is not considered that the process itself would be a significant contributor to Local Air Quality problems. However, the site will work with the authorities towards the objectives of any adopted Local Air Quality Action Plans (if adopted).	BAT
Stacks, Vents and Process Exhausts			
5.39	Liquid condensation on internal surfaces of stacks and exhaust ducts might lead to corrosion and ductwork failure or to droplet emission. Adequate insulation will minimise the cooling of waste gases and prevent liquid condensation by keeping the temperature of the exhaust gases above the dewpoint. A leak in a stack/vent and the associated ductwork, or a build-up of material on the internal surfaces may affect dispersion. Flues and ductwork should be cleaned to prevent accumulation of materials, as part of the routine maintenance programme.	All fixed plant must have a preventative maintenance process in place in accordance with EM-P-014 Maintenance Procedure. This includes a system to correct any deficiencies identified, frequency of planned inspection and certification process requirements (*e.g.* statutory inspections as required by local legal and other obligations). Flues and ductwork will be included within the programme.	BAT

Ref.	BAT Requirement	BAT Assessment	Conclusion
5.40	When dispersion of pollutants discharged from the stack (or vent) is necessary, the target exit velocity should be 15m/sec under normal operating conditions, however, lower velocities than 15m/s are acceptable provided adequate dispersion and dilution is achieved. In order to ensure dispersion is not impaired by either low exit velocity at the point of discharge, or deflection of the discharge, a cap, or other restriction, should not be used at the stack exit. However, a cone may sometimes be useful to increase the exit velocity to achieve greater dispersion.	Efflux velocity is 18.5 ms^{-1}. No cones or restrictions are fitted to the final exit point from the stack.	BAT
Management – Management techniques			
5.42	Important elements for effective control of emissions include: Proper management, supervision and training for process operations; Proper use of equipment; Effective preventative maintenance on all plant and equipment concerned with the control of emissions to the air; and Ensuring that spares and consumables - in particular, those subject to continual wear – are held on site, or available at short notice from guaranteed local suppliers, so that plant breakdowns can be rectified rapidly. This is important with respect to arrestment plant and other necessary environmental controls. It is useful to have an audited list of essential items.	The fixed plant operator shall be sufficiently trained in accordance with EM-P-002, the formal documented training process shall include as a minimum: Fixed Plant Work Instruction(s) and comprehension verification when inducted and on a three-yearly basis thereafter or when there has been any significant change. All fixed plant is required to have a preventative maintenance programme in place in accordance with EM-P-014 Maintenance Procedure. Pre-start/shift checks are also required. The site will maintain a Critical Spares List.	BAT
Management – Appropriate management systems			

Ref.	BAT Requirement	BAT Assessment	Conclusion
5.43	Effective management is central to environmental performance; it is an important component of BAT and of achieving compliance with permit conditions. It requires a commitment to establishing objectives, setting targets, measuring progress and revising the objectives according to results. This includes managing risks under normal operating conditions and in accidents and emergencies. It is therefore desirable that installations put in place some form of structured environmental management approach, whether by adopting published standards (ISO 14001 or the EU Eco Management and Audit Scheme [EMAS]) or by setting up an environmental management system (EMS) tailored to the nature and size of the particular process. Operators may also find that an EMS will help identify business savings.	Harsco has an Integrated Management System which is certified to ISO14001:2015 Standard. This will be applied at the Cardiff facility. Activities undertaken at Celsa Cardiff are included within the scope of the current certified Celsa ISO 14001/EMAS system.	BAT

Ref.	BAT Requirement	BAT Assessment	Conclusion
5.44	Regulators should use their discretion, in consultation with individual operators, in agreeing the appropriate level of environmental management. Simple systems which ensure that LAPPC considerations are taken account of in the day-to-day running of a process may well suffice, especially for small and medium-sized enterprises. Regulators are urged to encourage operators to have an EMS for all their activities, but it is outside the legal scope of an LAPPC permit to require an EMS for purposes other than LAPPC compliance. For further information/advice on EMS refer to the appropriate chapter of the appropriate Guidance Manual for England and Wales, Scotland and Northern Ireland.	Please refer to Ref. 5.43.	BAT
Management – Training			
5.45	Staff at all levels need the necessary training and instruction in their duties relating to control of the process and emissions to air. In order to minimise risk of emissions, particular emphasis should be given to control procedures during start-up, shut down and abnormal conditions. Training may often sensibly be addressed in the EMS referred to above.	Plant supplier will provide initial training regarding operation of the plant. A copy of the environmental permit will be readily available on site and the associated conditions will be communicated to all undertaking activities/who have responsibilities under the permit. Operatives will be shall be trained in accordance with Training Awareness & Competence Procedure EM-P-002. A suite of site-specific Work Instructions (WI's) will be developed for the plant. All WI's include 'Environmental Considerations' and a sign off and authorisations section. All employees receive Environmental Awareness Training.	BAT
Management – Maintenance			

Ref.	BAT Requirement	BAT Assessment	Conclusion
5.46	Because of the harsh operating environment for roadstone coating, effective preventative maintenance plays a key part in achieving compliance with emission limits and other provisions. All aspects of the process including all plant, buildings and the equipment concerned with the control of emissions to air should be properly maintained.	Harsco Procedure EMP-011 Fixed Plant. All fixed plant must have a preventative maintenance process in place in accordance with EM-P-014 Maintenance Procedure. This includes a system to correct any deficiencies identified, frequency of planned inspection and certification process requirements (*e.g.* statutory inspections as required by local legal and other obligations). Pre-start checks must be undertaken and recorded on the pre-shift inspection sheet. Records are maintained on file.	BAT

It is concluded that the proposed asphalt plant meets or exceeds all BAT requirements outlined within PG3/15(12).

5 Managing the Activities

5.1 Overall Management

Celsa Manufacturing (UK) Ltd has implemented and maintains an Environmental Management System (EMS) that is certified to ISO14001:2015 (Certificate No. ES081434) and EMAS (Reg. No. UK-000178).

The EMS continues to be maintained and is externally audited (by Bureau Veritas) whilst delivering all indicative Best Available Technique (BAT) requirements for an effective management system. The current management systems will be updated to include the proposed operations as the activities at this Site will provide a direct connection into the existing operations at the Cardiff site (*i.e.* the activity is directly associated with the operation of an electric arc furnace, section mill, road and bar mill and the mineralization of slag').

Celsa Manufacturing (UK) Ltd also operates a certified OHSAS18001:2007 Occupational Health and Safety Management System. These systems will also be applied to the proposed processes.

All new process will be audited (by Bureau Veritas) under the existing certifications even though the operations are to be carried out by third parties (*i.e.* G R Plant Ltd and Harsco Metals). Compliance with the environmental permit is fundamental to the Celsa management system approach whilst also ensuring outsourced activities are effectively controlled (ISO14001: 2015 Section 8.1).

The overall management structure of the slag processing and asphalt plant operation is outlined within **Figure *5-1***.

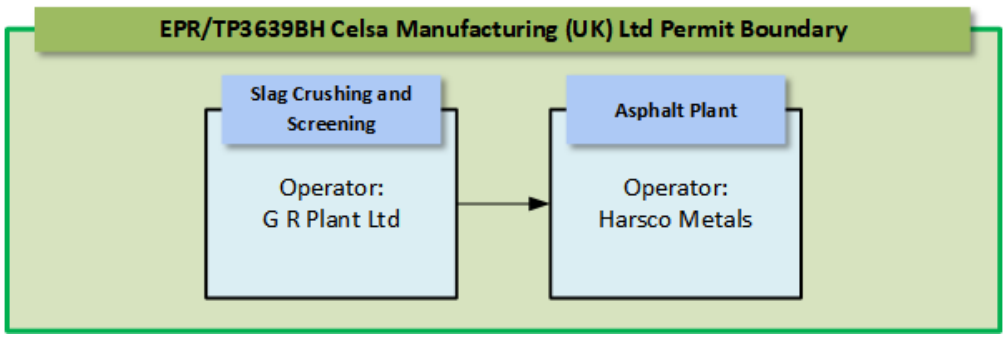


Figure 5-1: *Slag processing and asphalt operational responsibilities*

5.2 Operations and Maintenance

Celsa uses a "risk" based approach for assessing the criticality of site equipment in terms of Health, Safety, Environment requirements. As well as the criticality of the plant the equipment is given a priority which determines how quickly an unplanned failure of said equipment is responded to.

The site will establish and will maintain a Planned Preventative Maintenance (PPM) schedule for the new operations in-line with manufacturer's recommendations. This will identify all critical environmental equipment that is used to mitigate or prevent environmental impacts. All records associated with these activities will be maintained on-site and controlled as part of the ISO14001 management system. Any breakdown or malfunction of plant or equipment that could result in abnormal emissions of dust or odours are dealt with promptly and process operations adjusted until normal operations can resume. Any such events are recorded in the site diary and on the company ProSafety system.

5.3 Accidents

Celsa has established and maintains an accident and pollution management emergency plan which is subject to regular review and update and is controlled via the EMS. The plan details site drainage, site services, location of hazardous materials (*e.g.* fuels and oils), emergency response equipment, pollution control points *etc.* Where required the emergency plan will be revised to take in to account any identified deficiencies.

Appropriate spill kits and absorbents will be available throughout the site. These will be subject to regular inspection to ensure stock levels are maintained. All operatives will be trained in their use.

5.4 Incidents and non-conformances

Accidents, Incidents, complaints and non-conformances are to be handled through the existing processes that form part of the ISO 14001 EMS.

5.5 Site security

The site itself is surrounded by a 2.4-metre-high palisade fence. All access on to site will be controlled by the appropriate manager. No unauthorised access will be permitted. The site will be fitted with permanent CCTV.

5.6 Sufficient competent persons and resources

The total manning of the site can vary dependent upon the level of activity being undertaken. Celsa provides engineering, technical, transport, administration and environmental support. Celsa Manufacturing (UK) Ltd will provide a comprehensive training programme for the site and the proposed operations in-line with the required competency requirements (*e.g.* general environmental awareness, maintenance and operational activities, accident and emergency response). This training will be provided to all site operatives.

The appropriate manager provides the necessary Technically Competent Management and is recognised by holding WAMITAB Certificate of Technical Competence. According to WAMITAB a Metal Recovery Site (MRS) Dry Scrap (including separately collected batteries – no free-flowing liquid) is considered LOW RISK with the following qualification requirements:

- WAMITAB Level 4 Low Risk Operator Competence for Non-hazardous waste transfer and storage (601/08514/4) (LROC1)
- WAMITAB Level 4 Certificate in Waste and Resource Management (601/2388/6) (VRQ, Unit 6a) (only available for in-house storage)
- Environmental Permitting Operators Certificate (EPOC)

The proposed technically competent person is:

- **Name:** Mr. Richard O'Neill
- **Certificate of Technical Competence:** Level 4 in Waste Management Operations – Managing Treatment Hazardous Waste (4TMH) – 06/11/2012, Serial No. 17186/11/1, Certificate No. 12815.
- **Operator Competence Certificate:** Level 4 in Waste Management Operations – Managing Treatment Hazardous Waste (4TMH) – 06/11/2012, Certificate No. OCC3418.
- **Continuing Competence Certificate:** TSH/TMH awarded 24/07/2017. Expires 24/07/2019. Certificate No. CCC14850

All site Operatives will be made aware of the requirements of the EPR Permit.

5.7 Records that demonstrate your management system

Records relating to the operation of the site are to be handled through the existing processes that form part of the ISO 14001 EMS. All records relating to the operation of the installation will be maintained as per the stated procedures.

Non-hazardous waste transfer documentation will be maintained on-site for a period of 2 years. If any consignments of hazardous waste are removed the consignment notes will be maintained on-site for a period of 3 years.

The site condition at the start of the permitted period will be recorded within a photographic record. In addition, the site operator will keep records of the:

- design, construction, inspection, monitoring and maintenance of all pollution prevention infrastructure;
- spills and incidents and any resulting corrective and/or preventative actions;
- actions taken if the NRW identify relevant non-conformances or failures; and
- off-site impacts such as pollution incidents that caused, or are alleged to have caused, harm or health effects.

5.8 Access to the permit

Access to the permit will be through existing internal systems (*i.e.* intranet and on-site noticeboard). Where contractors undertake work within the site the requirements of the permit will be actively brought to their attention.

5.9 Permit surrender and closure

Upon cessation of activities the following site closure plan would be initiated:

- Disconnection of electrical supply and make safe.
- Drain down and empty any above ground storage tank.
- Remove all plant and equipment.
- Remove and dispose of all remaining waste materials in-line with current regulatory requirements.

- Undertake site surrender SCR monitoring (*i.e.* provide the evidence necessary to demonstrate to the NRW that the site does not pose a pollution risk and is in a satisfactory state).

5.10 Harsco Metals – Management System Processes

The proposed operator of the asphalt plant (Harsco Metals and Minerals SteelPhalt) operates a certified ISO14001 EMS at their current permitted site in Rotherham, South Yorkshire. Harsco propose to replicate the established procedures utilised at this site on the Cardiff site.

The environment policy clearly states that Harsco Metals and Minerals will minimise the environmental impact of its activities through specific operational controls and ensure continual improvement.

The site management establish and maintain specific environmental objectives and targets on an annual basis (reviewed after 6 months) as part of formal management review process which aims to improve environmental performance and reduce impact. There are also Corporate Regional Europe North and Europe East objectives established by the organisation and these are incorporated into site objectives (where appropriate), again there are established on annual basis.

Procedures are established and maintained (where necessary) in order to facilitate the effective performance of the EMS and to ensure actual and or potential environmental impacts are minimised. Specific procedures and systems (operated at the Rotherham plant) are outlined below:

- Structure, roles and responsibility – All operational procedures outline who is responsible for specific activities and/or requirements. The business unit has an organogram highlighted within the Contract Plan for the operation.

- Training awareness and competence – 'HM-P-0020 Training Awareness and Competence' is the specific company procedure that is ensures those involved in all activities are suitably trained and/or knowledgeable in order to carry out their duties competently.

- Communication – 'HM-P-0039 Consultation and Communication' is designed to ensure that significant environmental and OH&S risks are communicated to Harsco employees and to other interested parties that could be impacted. To promote ownership and involvement employees are actively involved in the process of procedure development and communication.

- Environmental Aspects – The management system requires Harsco Metals and Minerals to assess activities at each site in accordance with 'HM-P-009 Risk Assessment' to determine the significance these activities may have in relation to impacts on the environment. A risk ranking matrix is used as a means of prioritising significant aspects and where necessary to prioritise corrective/preventive actions to ensure effective control. Scores twelve and above (>12) are classed as a significant risk to the environment. The site environmental aspects (risks) are reviewed annually or as circumstances change (**Figure *5-2***).

Frequency of Events (F)	Point Score	Risk/Likelihood of occurrence ®	Point Score	Impact on the Environment (I)	Point Score
Continuous	3	Likely, expected to happen, frequently used/consumed.	3	Extensive long term environmental damage, (prohibition/improvement notice and or prosecution by Regulator)	3
Frequent >one/month	2	Possible, does happen, used/consumed.	2	Moderate Impact but localised. Report Incident to Regulator and carry out an Internal Investigation	2
Rare (1 event, Infrequent use)	1	Unlikely, Inconceivable, minimal use.	1	Little/no Impact. Internal Investigation.	1

Figure 5-2: *Harsco risk assessment matrix (from HM-P-009 Risk Assessment)*

- Documentation – 'HM-P-0005 Document and Record Control' describes the control of documents and records, their approval, issue and modification, storage.

- Efficient Process Control – 'HM-P-0041 Management of Change' addresses changes to activities and their consequences to ensure that any process should be controlled efficiently whilst reducing risk to an acceptable level. Specific Work Instructions (WI) are established and maintained for key operations associated with the plant *e.g.* WI-SP-ASP-1526 Operation of Asphalt Plant. Where required, these procedures and work instructions set-out strict environmental performance criteria with the aim of meeting legislative and permit requirements (*e.g.* fugitive dust control, compliance with emission limit values *etc.*).

- Maintenance programmes – 'HM-P-0014 Maintenance Service and Inspection procedure' details the inspection requirements of equipment including those likely to adversely affect the environment. The procedure includes both internal inspection regimes (*e.g.* planned preventative maintenance) and inspection by external parties.

- Emergency preparedness and response – Corporate European procedure 'EM-P-015 Disaster and Emergency Management' requires that all likely sources of disaster and emergency be identified, and measures taken to minimise any associated risks.

- Compliance with environmental legislation – 'HM-P-0018 Internal Audits and Inspection procedure' requires that all Harsco sites are continually checked against predetermined

compliance criteria. These criteria are updated from the Corporate legal register (as required) to ensure compliance against legislative requirements is achieved.

- Monitoring and measurement – 'HM-P-0023 Performance measurement and monitoring' ensures Harsco Metals and Minerals undertakes (on a regular basis) the measurement and monitoring of key characteristics of Company performance and operational controls in order to ensure compliance and continual improvement.

- Quality Control – SteelPhalt operates a rigorous Quality Assurance system complying with BS EN 13108:21 Factory Production Control, Sector 14. This is achieved by continuous inspection, sampling and testing, right along the supply chain.

- Corrective and preventative action – 'HM-P-0016 Corrective and preventative action' ensures that an effective system exists for preventing the reoccurrence of non-conformities.

Harsco propose to replicate the established procedures utilised at the Rotherham site on the Cardiff site. This should allow the site operator demonstrate BAT with respect to management system requirements.

6 Energy and Climate Change

6.1 Introduction

As part of Celsa's Environmental Management System, Celsa has identified all its potentially significant environmental aspects, whilst considering its legal requirements. Objectives and targets are set on an annual basis to deliver continual improvement in the management of these environmental aspects.

Celsa's governance of environmental issues goes beyond compliance with regulatory requirements and the company commitment to EMAS is evidence of this commitment to operate our business in an environmentally responsible manner. This is demonstrated through the setting of targets that deliver continued environmental performance.

As part of the metal recycling process, a significant amount of energy is used in the form of electricity, natural gas and carbon additions. We are careful to ensure that our processes are efficient to minimise the use of energy and to avoid waste.

This section has been completed in conjunction with reviewing the guidance contained with the Horizontal Guidance H2 Energy Efficiency[8].

6.2 Electricity Use

The asphalt plant electrical plant specifications are outlined within **Table *6-1***.

The proposed operating hours of the asphalt plant are 10 hours per day, five days a week (6am to 4pm) with weekend operation (as required). In general, is anticipated that there will be operations occurring 300 days per year (82% utilisation).

The estimated annual operating hours is 3000 (assuming 10 hours per day for 300 days). This equates to an annual total of 2850 MW (based on constant operation/load).

Table 6-1: *Energy use within the asphalt plant*

Item	Equipment	Type	No. Units	Plated Rating (kW)	Total (kW)
Motor	Feeder motors	Inverter	6	3	18
Motor	Vibrators	Direct online	2	0.3	0.6

8 https://www.gov.uk/guidance/energy-efficiency-standards-for-industrial-plants-to-get-environmental-permits

Item	Equipment	Type	No. Units	Plated Rating (kW)	Total (kW)
Motor	Collecting conveyor	Direct online	1	7.5	7.5
Motor	Dryer feed conveyor	Direct online	1	11	11
Motor	Dryer	Soft start	4	30	120
Motor	Burner blower	Soft start	1	45	45
Motor	Fuel pump	Direct online	1	7.5	7.5
Motor	Burner compressor	Direct online	1	11	11
Motor	Hot elevator	Soft start	1	30	30
Motor	Screen	Direct online	2	15	30
Motor	Mixer	Soft start	2	45	90
Motor	Compressor	Direct online	1	15	15
Motor	Coarse dust screw	Direct online	1	7.5	7.5
Motor	Cleaning mechanism	Inverter	2	0.75	1.5
Motor	Filter screw	Direct online	1	7.5	7.5
Motor	Dust screw	Direct online	1	7.5	7.5
Motor	Rotary valve	Direct online	1	1.1	1.1
Motor	Exhaust fan	Inverter	1	160	160
Motor	Dust elevator	Direct online	1	5.5	5.5
Motor	Imported dust screw	Direct online	1	11	11
Motor	Recl. dust screw	Direct online	1	5.5	5.5
Motor	Recl. dust screw	Direct online	1	7.5	7.5
Motor	Dust conditioner	Direct online	1	15	15
Motor	Water pump	Direct online	1	1.5	1.5
Motor	Recl. Dust screw	Direct online	1	5.5	5.5
Motor	Rotary valve	Direct online	1	1.1	1.1
Motor	Bitumen pump	Fwd/Rev	1	15	15

Item	Equipment	Type	No. Units	Plated Rating (kW)	Total (kW)
Motor	Bitumen fill pump	Direct online	1	15	15
Motor	Skip winch	Inverter	1	90	90
Motor	SMA Blower	Direct online	1	15	15
Motor	SMA screw conveyor	Direct online	1	2.2	2.2
Other	Bitumen weigh scale	Single Phase	1	1	1
Other	Storage silo heating	Three Phase	2	3	6
Other	Bitumen tank heating	Three Phase	3	45	135
Other	Motorized stirrers	Three Phase	3	5.5	16.5
Other	Trace heating	Three Phase	6	3	18
Other	Winch supply	Three Phase	1	1	1
Other	Cabin supply	Single Phase	1	10	10
Lighting	Hot storage	Sodium-vapour	2	0.4	0.8
Lighting	Cold feed section	Sodium-vapour	1	0.4	0.4
Lighting	Bag filter	Sodium-vapour	1	0.4	0.4
Lighting	Bitumen Tanks	Sodium-vapour	1	0.4	0.4
Total				**664.55 kW**	**950 kW**

6.3 Liquid Petroleum Gas Use

The plants dryer uses a RAX JET 4 dual fuel, gas oil and natural gas fired with flame failure detection. Suitable for gas oil, heavy fuel oil (pre-heated) and natural gas. The burner (thermal output of 23,720 kW) associated the dryer can run on natural gas and gas oil. The fuel capacity is as follows:

- Natural gas - 1870 m^3/h (est. calorific value 45,600 kJ/m^3)

The proposal is to run the plant solely on natural gas. Operating experience has shown that gas oil backup is not required and will not be installed.

6.4 Energy Use within the Installation

The energy usage within the installation has been calculated by identifying and reviewing all plant and equipment within the scope of the installation.

Direct releases occur where primary energy is converted to heat and/or electricity at the installation, *e.g.* through use of gas-fired dryer. Indirect releases are those associated with the consumption of electricity or heat generated elsewhere (*i.e.* third-party supply or from an off-site power station). The conversion factor from electricity delivered to primary is 2.4 as per EA Horizontal Guidance Note H2 Energy Efficiency and the H1 database. This takes into account both generation losses and transmission losses associated with the transfer across the National Grid. The total and specific energy consumption for the installation is outlined within **Table *6-2***.

Table 6-2: *Energy sources and annual consumption*

Source	Type	Delivered (MWh/year)	Conversion Factor	Primary (MWh/year)
Electricity from public supply	Indirect emissions	2,850	2.4	6,840
Natural gas	Direct emissions	71,060	1.0	71,060
Total		**73,910**		**77,900**

Notes:

The proposed operating hours of the asphalt plant are 10 hours per day, five days a week (6am to 4pm) with weekend operation (as required). In general, is anticipated that there will be operations occurring 300 days per year (82% utilisation). The estimated annual operating hours is 3000 (assuming 10 hours per day for 300 days).

6.5 Carbon Dioxide Emissions as a Result of Energy Use

The reporting of direct and indirect emissions of carbon dioxide resulting from the consumption or generation of energy by the activities covered in the permit is included as part of this overall reporting of environmental emissions. Environmental emissions relating to the consumption of energy at the installation are limited to those emissions arising from the use of natural gas at the site itself and indirectly from the use of fossil fuels at the power station

providing the electricity to the installation. The estimated carbon emissions are outlined within **Table *6-3***.

Table 6-3: *Energy sources and annual carbon dioxide emissions*

Source	Type	Primary (MWh/year)	CO_2 Factor	CO_2 (tonnes/year)
Electricity from public supply	Indirect emissions	2,850	0.17	1,135
Natural gas	Direct emissions	71,060	0.23	16,344
Total		**73,910**		**17,479**

Notes:

The proposed operating hours of the asphalt plant are 10 hours per day, five days a week (6am to 4pm) with weekend operation (as required). In general, is anticipated that there will be operations occurring 300 days per year (82% utilisation). The estimated annual operating hours is 3000 (assuming 10 hours per day for 300 days).

6.6 Climate Change Levy

Climate change agreements are voluntary agreements made by UK industry and the Environment Agency to reduce energy use and carbon dioxide (CO_2) emissions. In return, operators receive a discount on the Climate Change Levy (CCL), a tax added to electricity and fuel bills. The Environment Agency administers the CCA scheme on behalf of the whole of the UK.

CELSA currently operates under a Climate Change Levy Agreement (CCLA) within the UK Steel Association sector. UKSA/CELSA/N/00001 will apply to the varied installation.

6.7 Management of Energy Use

Harsco (the operator of the asphalt plant) is committed to managing and reducing the environmental impact of its operations (wherever possible). Energy reduction programmes are established and maintained at all sites with carbon footprint reduction objectives being set on annual basis. Furthermore, on a six-monthly basis each Harsco site has an obligation to report its environmental metrics which includes electricity, diesel, and gas. Wherever possible this information is taken from metered reading or where this is not possible, then the

information is based on estimations or calculations. The documented evidence of this is submitted via the Corporate environmental portal.

The aim of this is to evaluate the environmental impact Harsco's activities (*i.e.* buildings, processes and transport) and identify opportunities for improvement. These opportunities can be reflected in the site improvement objectives (if deemed feasible). In all cases these objectives form part of the ISO 14001 EMS. In addition, the regular monitoring of site energy consumption and the planned preventative maintenance of equipment is carried out on a regular inspection cycle.

7 Emissions to Air, Water and Land

7.1 Point Source Emissions to Air

As stated within *Section 4.4* dust collection from the dryer is via a primary system (skimmer) and secondary system (bag filter) with a capacity of 118,825 m^3/h. The outlet from the bag filter unit discharges to a stack 22 metres in height **(Emission point Ref: A5)**.

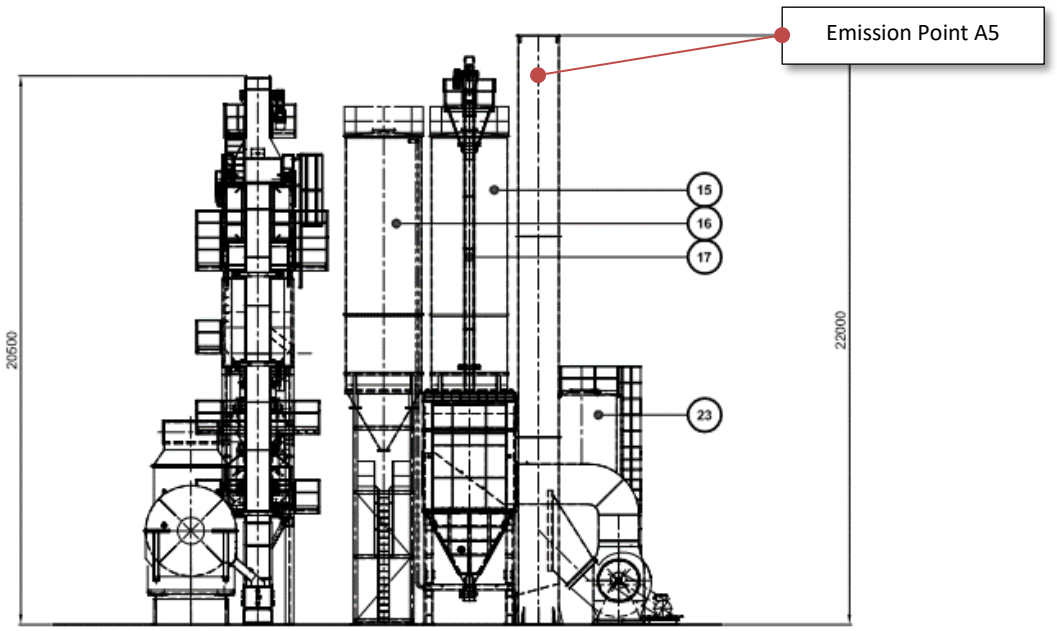


Figure 7-1: *Emission point A5 - Asphalt Plant*

Parker Plant Limited (2018). StarMix 4000 320 tph static asphalt plant, DRG PP1924, Issue 7

The operational characteristics of the emission point are outlined within **Table *7-1***.

Table 7-1: *Asphalt plant (Point A5) operational data*

Parameter	Units	Stack and Emission Data
Actual stack height	m	22
Effective stack height	m	22[*1]
Stack diameter	m	1.5
Stack location	UK NGR	TBC post installation

Parameter	Units	Stack and Emission Data
Efflux velocity	ms^{-1}	18.5
Total Flow	m^3/hr	118,825 m^3/h This is composed of 101,400 m^3/hr from the dryer, 15,725 m^3/hr from the nuisance control collection points and 1,700 m^3/hr from the silo vents.
Operating mode	% year	82% (300 operating days per annum)
Notes: *1 The effective height of release has been taken as 22 metres (actual stack height) as the stack is greater than 3 metres above the ground and/or building (lattice structure) near to which the stack is located. The closest building is approximately 158 metres NNE (*i.e.* the new proposed scrap processing centre) located on the Rover way site. This is greater than 5L hence actual stack height has been used as effective stack height.		

Harsco Metals Group Limited has been developing and manufacturing high performance asphalt products for the UK roadmaking industry since the 1960s. Their current plant in Rotherham (South Yorkshire), that is permitted as a Part B installation (Section 3.5 (a) and (e)) has been permitted since 2013 and, as a result, there is substantial historical point source air emissions data available from the Rotherham Particulate and Compliance Emission Monitoring (PCME) system.

Data has been provided by Harsco from the Rotherham plant PCME for the period 02/06/2017 (18:30) to 22/01/19 (13:15). This equates to 57,502 data points (*i.e.* sampled every 15 minutes). The data is summarised in **Table *7-2***.

Table 7-2: *15-minute Particulate Emissions (2017 – 2019), Harsco Rotherham*

Range (mg/m^3)	No. Data Points	Compliance Point
0 - 10	55,482	
11 - 20	1391	
21 – 30	210	
31 - 40	101	
41 - 50	88	Compliance point 50 mg/m^3
51 - 60	54	

Range (mg/m^3)	No. Data Points	Compliance Point
61 - 70	40	
71 - 80	25	
81 - 90	22	
91 - 100	5	
101 - 110	17	
>111	67	

The data shows that 57,272 (99.6%) of emissions were at or below the 50 mg/m^3 particulate Emission Limit Value (ELV). It is important to note that the presented data also includes emissions during initial start-up and shut-down periods. In-line with process guidance note PG3/15(12) the emission limit values do not apply during start-up and shut-down periods.

Harsco sets an internal lower control limit that alarms at 35 mg/m^3 which allows the operator to review compliance against the compliance limit of 50 mg/m^3. It is reported by Harsco that exceedences are usually only during the initial start-up and shut-down periods or where localised damage has occurred to the filter medium (aramid filtration bags). Investigation and corrective actions are undertaken when the 35 mg/m^3 limit is exceeded.

Under EU directives, the NRW must make sure the emissions don't exceed Ambient Air Directive (AAD) Limit Values. The relevant limits are outlined within **Table *7-3***

Table 7-3: *Ambient Air Directive Limit Values*

Substance	Emission Period	Limit (Average)	Standard	Exceedances (allowed per annum)
Particulates (PM10)	24-hour	50 mg/m^3	AAD Limit Value	Up to 35 times a year
Particulates (PM10)	Annual	40 mg/m^3	AAD Limit Value	None
Particulates (PM2.5)	Annual	25 mg/m^3 [*1]	AAD Limit Value	None
[*1] From 2020 changing to 20 mg/m^3.				

The Harsco Rotherham plant 24-hour average particulate emissions are summarised in **Table *7-4***. No exceedences of the 24-hour average 50 mg/m^3 limit were recorded.

Table 7-4: *Harsco Rotherham 24-hour daily average (Particulates mg/m^3 - 2018)*

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
01	0.05	2.74	0.02	0.02	3.15	1.37	1.70	6.36	1.09	0.98	1.92	0.17
02	0.79	1.76	0.55	1.53	1.49	0.03	2.21	3.01	0.79	1.38	2.89	2.57
03	0.54	0.04	0.35	10.23	3.01	0.84	3.95	1.06	1.75	1.38	0.69	5.78
04	0.21	2.24	0.95	5.69	2.36	1.91	3.24	0.22	2.39	1.89	0.81	3.27
05	0.64	2.08	3.85	9.61	0.03	2.05	2.41	0.62	2.07	1.86	1.81	4.05
06	0.07	2.27	2.93	9.56	0.10	2.51	2.55	1.60	2.05	1.88	2.03	3.50
07	0.29	3.27	2.08	3.42	0.09	2.14	0.73	2.06	2.02	2.44	5.29	5.22
08	2.46	3.05	1.87	3.36	4.25	4.35	1.06	1.53	0.45	1.95	2.74	1.21
09	2.02	1.85	1.88	4.62	3.28	0.22	3.79	1.24	1.03	3.13	1.31	0.89
10	2.04	0.24	0.04	20.37	1.35	1.28	2.74	1.02	1.84	3.18	0.57	1.89
11	1.47	4.31	1.18	26.63	1.54	2.52	2.42	0.37	1.99	2.59	0.45	1.59
12	0.76	2.89	8.62	27.02	0.68	2.63	2.74	0.50	2.11	2.57	2.19	2.16
13	0.01	3.07	3.39	7.47	1.43	1.91	2.93	1.18	2.17	0.61	1.77	5.50
14	1.26	2.61	3.76	3.88	1.99	5.15	1.51	1.12	1.30	2.12	2.05	2.92
15	4.79	1.50	10.05	1.02	2.31	1.47	0.75	0.93	0.50	1.68	2.58	0.57
16	3.25	2.07	4.46	11.75	1.64	1.21	2.16	1.17	0.58	1.90	2.10	1.53
17	2.97	0.23	0.24	12.02	2.95	2.27	2.84	1.28	1.65	2.47	2.04	2.52
18	3.21	0.72	0.03	5.55	2.81	2.88	3.46	0.15	1.66	3.27	2.46	4.71
19	1.17	2.77	11.69	3.46	0.25	3.45	2.51	0.68	3.20	2.07	3.51	3.43
20	0.01	2.61	3.08	2.42	0.75	4.18	2.89	1.45	2.75	0.01	5.16	1.98
21	0.91	2.07	5.61	0.41	2.60	4.64	0.96	1.41	4.80	1.39	4.56	0.64
22	3.14	2.48	3.30	1.49	6.45	3.88	0.99	1.00	0.53	2.64	3.67	0.03

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
23	2.32	2.48	3.95	3.01	4.82	0.02	5.05	1.34	0.69	2.14	2.29	0.06
24	5.47	0.44	1.19	2.31	3.33	1.29	4.50	1.01	1.66	2.02	0.01	0.01
25	2.16	1.59	2.14	4.95	1.56	1.94	4.30	0.01	1.65	3.52	2.75	0.01
26	1.59	2.31	5.55	6.57	0.02	1.60	5.67	0.04	1.55	1.76	3.49	0.01
27	0.57	1.49	8.50	1.93	0.03	1.54	4.27	0.16	1.89	0.36	1.64	0.01
28	0.73	0.86	4.83	0.20	0.86	2.16	0.18	1.21	1.90	1.90	2.66	0.01
29	3.11		3.65	3.87	1.25	1.28	2.23	1.80	0.40	3.52	5.95	0.01
30	3.41		0.25	3.35	1.61	0.53	6.69	1.78	0.50	1.94	3.24	0.01
31	3.39		0.19		2.78		7.18	1.85		4.53		0.01

The annual daily average particulate emissions from the Harsco Rotherham site in the period 2017 – 2019 were 2.09 mg/m^3. This is significantly less than the 40 mg/m^3 annual limit.

7.2 Point Source Emissions to Surface Water

There are no new point source emissions to surface water from the installation.

7.3 Point Source Emissions to Sewer

There are no new point source emissions of trade effluent to sewer from the installation.

7.4 Point Source Emissions to Groundwater

The drainage strategy for the asphalt plant has been designed by SLR Environmental in accordance with current best practice guidance. The SuDS Manual (CIRIA Report C753)[9], promotes sustainable drainage systems (SuDS) as a means of mitigating the impact of development. The asphalt plant has been zoned as follows:

- **Interim Aggregate Processing Area** – The interim aggregate processing area will remain unsurfaced and therefore no specific drainage measures are required.

9 CIRIA (2015). Report C753, The SuDS Manual

- **Asphalt Plant Area** – The existing concrete hardstanding is to be replaced to serve the proposed asphalt plant area. The new hardstanding will be formally drained via infiltration drainage, *i.e.* the use of a soakaway (***Figure 7-2***). It has also to be accepted that the movement of feedstock into the storage bins and vehicle movements along the delivery and dispatch route are likely to deposit silts derived from the made ground onto the concrete hardstanding. Without mitigation, these silts would significantly impair the performance of the soakaway through siltation. It is therefore proposed to incorporate a siltation lagoon and attenuation storage area immediately upstream of the soakaway. This has the advantage of significantly reducing the size of the soakaway required.

- **Lorry Delivery and Dispatch Route** – The existing track along which the asphalt plant will be accessed is to be retained and improved (with asphalt), however, it will not be formally drained. Therefore, no specific drainage measures are required.

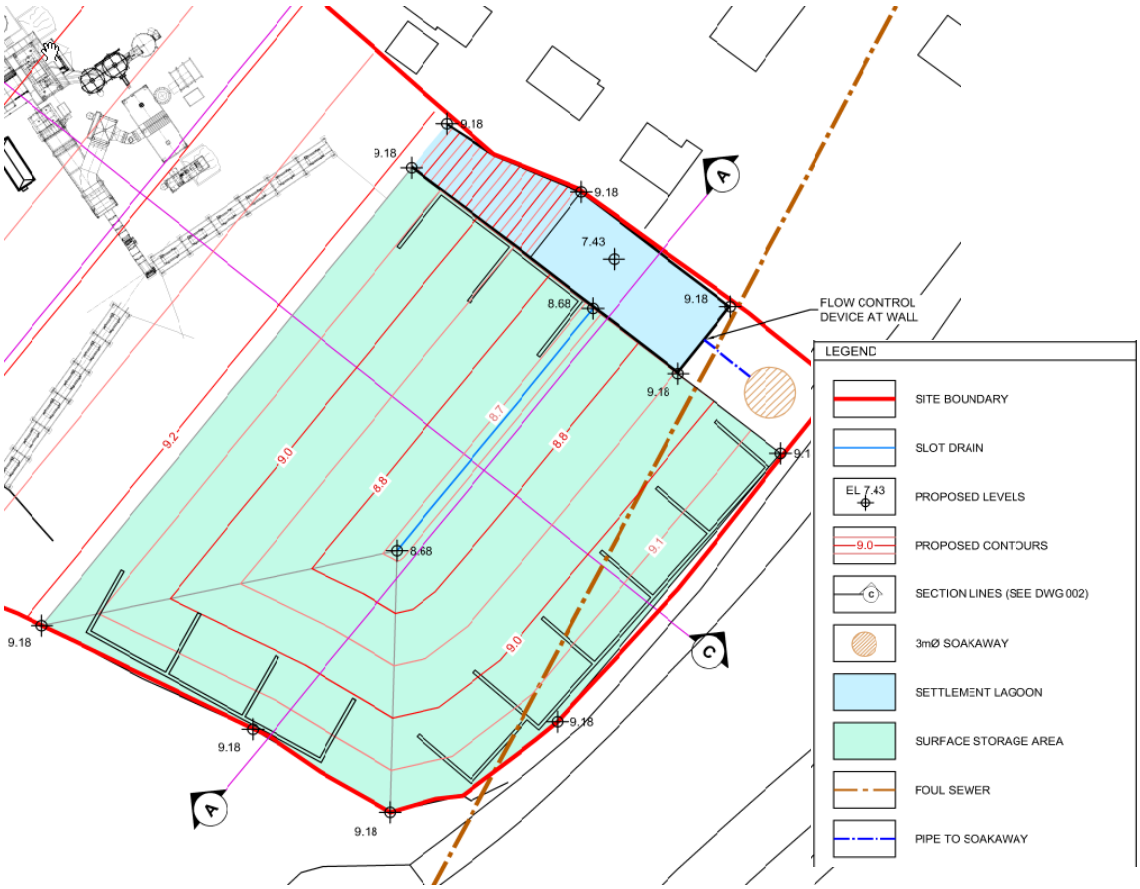


Figure 7-2: *Surface water drainage arrangements*

Harsco (2018). Surface water drainage, DWG 001, Revision D0, SLR Environmental

The settlement lagoon can be configured (if required) for oil retention by placing a scum board across the outlet to the soakaway. The maximum discharge rate will be between 5 and 10 ls^{-1} and it is anticipated that 0.5 m depth of water will be retained in the lagoon when fully drained. Cross sections across the asphalt yard and settlement lagoon are outlined within *Annex C*.

The results of Waste Acceptance Criteria (WAC) leaching test performed on Made Ground samples completed as part of the Geotechnical & Geo-environmental study have been used to estimate the likely leaching of analytes from the silt runoff when stored in a settlement lagoon.

SLR reports that the results indicate that most of the metals are non-detected, or of low concentration. In terms of other analytes chloride is low and sulphate, although higher in concentration, is not likely to be an issue as the mean is below relevant Environmental Quality Standards (EQSs).

In terms of pH, this is, as expected relatively high and alkaline. However, there are two important points:

- When the surface water is exposed to atmosphere, it is likely that the carbon dioxide concentration in the water will increase and, given that this is an acidic gas, the pH of the water will decrease; and
- The pH of the ground analysis is 8.1 – 9.6. Therefore, if the settlement water maintained a pH = c.10 - 11 and the pH of the groundwater volume to which it infiltrates is c.8-9, then there is a factor of at least 10 difference between the two. Consequently, discharge into the groundwater is likely to have little or no impact on the pH of the underlying water.

SLR concludes that disposal of surface water runoff via a soakaway into the underlying made ground will have no significant impact on groundwaters.

The full description of the drainage strategy is outlined within the SLR Flood Consequences Assessment (FCA).

7.5 Point Source Emissions to Land

There are no direct point source emissions to land from any part of the installation.

7.6 Fugitive Emissions to Air

7.6.1 Mobile Screening and Crushing Plant

BAT, as defined within the BAT conclusions iron and steel production[10], is to determine the order of magnitude of diffuse emissions from relevant sources by defined methods. Whenever possible, direct measurement methods are preferred over indirect methods or evaluations based on calculations with emission factors (*i.e.* either using VDI 3790 Part 3 or US EPA AP42).

A calculation using emission factors (AP-42) has been utilised within the assessment. This is also a recommended approach outlined within the Reference Document on Best Available Techniques on Emissions from Storage (July 2006)[11].

AP-42, *Compilation of Air Pollutant Emission Factors*, has been published since 1972 as the primary compilation of the US Environmental Protection Agency's (US EPA's) emission factor information. It contains emissions factors and process information for more than 200 air pollution source categories.

Emission Factors

An emission factor is a representative value that attempts to relate the quantity of a pollutant released to the atmosphere with an activity associated with the release of that pollutant. These factors are usually expressed as the weight of pollutant divided by a unit weight, volume, distance, or duration of the activity emitting the pollutant (*e.g.* kilograms of particulate emitted per megagram of material burned). Such factors facilitate estimation of emissions from various sources of air pollution. In most cases, these factors are simply averaging of all available data of acceptable quality and are generally assumed to be representative of long-term averages for all facilities in the source category (i. e. a population average).

The general equation for emission estimation is:

$$E = A \times EF \times \left(1 - \frac{ER}{100}\right) \quad \textit{Equation 1}$$

Where:

10 COMMISSION IMPLEMENTING DECISION of 28 February 2012 establishing the best available techniques (BAT) conclusions under Directive 2010/75/EU of the European Parliament and of the Council on industrial emissions for iron and steel production (notified under document C(2012) 903) (2012/135/EU)

11 http://eippcb.jrc.ec.europa.eu/reference/BREF/esb_bref_0706.pdf

E = emissions

A = activity rate

EF = emission factor; and

ER = overall emission reduction efficiency (%)

ER is further defined as the product of the control device destruction or removal efficiency and the capture efficiency of the control system. When estimating emissions for a long-time period (*e.g.* one year), both the device and the capture efficiency terms should account for upset periods as well as routine operations.

Characterisation of Emissions

As outlined within *AP 42, Fifth Edition Compilation of Air Pollutant Emissions Factors, Volume 1: Stationary Point and Area Sources (Chapter 13 - Section 13.2.4 - November 2006)* dust emissions occur at several points in the storage cycle, such as material loading onto the pile, disturbances by strong wind currents, and loadout from the pile. The movement of trucks and loading equipment in the storage pile area is also a substantial source of dust.

Total dust emissions from aggregate storage piles result from several distinct source activities within the storage cycle:

- loading of aggregate onto storage piles (batch or continuous drop operations);
- equipment traffic in storage area;
- wind erosion of pile surfaces and ground areas around piles; and
- loadout of aggregate for shipment or for return to the process stream (batch or continuous drop operations).

Either adding aggregate material to a storage pile or removing it usually involves dropping the material onto a receiving surface. Truck dumping on the pile or loading out from the pile to a truck with a front-end loader are examples of batch drop operations. Adding material to the pile by a conveyor stacker is an example of a continuous drop operation.

The quantity of particulate emissions generated by either type of drop operation, per kilogram (kg) (ton) of material transferred, may be estimated, using the following empirical expressions:

$$E = k(0.0016) \times \frac{\left(\frac{U}{2.2}\right)^{1.3}}{\left(\frac{M}{2}\right)^{1.4}}$$ *Equation 2 (metric units kg/tonne)*

Where:

E = emission factor

k = particulate size multiplier (dimensionless)

U = mean wind speed (either ms^{-1} or mph)

M = material moisture content (%)

There are two principal sources of fugitive dust associated with the materials handling activities, namely particulate emissions from the slag (aggregate) handling and storage piles, which consists of loader and truck traffic around the storage piles and fugitive dust associated with the transfer of aggregate by buckets or conveyors.

Dust control techniques include:

- source reduction – mass transfer reduction;
- source handling improvement – *e.g.* work practices, transfer equipment, loading and unloading (*e.g.* drop heights, wind sheltering, moisture retention); and
- source treatment – *i.e.* water sprays or dust suppression.

Fugitive dust emissions, associated with the handling processes, are assessed in **Table *7-5***.

Table 7-5: *Fugitive Dust Emissions Assessment (Mobile Screening and Crushing Plant)*

Company Name	Celsa Manufacturing (UK) Ltd
Location	Tremorfa Melt Shop, Seawall Road, Tremorfa, Cardiff, CF24 5TH
Permit Number	EPR/TP3639BH
Objectives	Assessment of fugitive dust emissions from the proposed slag processing area
Activities	Material handling (stockpiles) associated with scalping, crusher and finishing screen

Emission Source			
Criteria	**Units**		**Data Source**
Material throughput	tonnes/hr	100	Harsco Metals Group Limited
Operating period	hr/day	10	Harsco Metals Group Limited
Annual workdays	day/year	300	Harsco Metals Group Limited
Annual Total	tonnes/year	300,000	Calculation

Emission Factor			
Criteria	**Units**		**Data Source**
PM_{10} particle size	k_{10}	0.35	AP42 - Chapter 13 - Section 13.2.4 (Nov. 2006)
$PM_{2.5}$ particle size	$k_{2.5}$	0.053	AP42 - Chapter 13 - Section 13.2.4 (Nov. 2006)
Mean Wind Speed	U (mph or ms^{-1})	4	Harsco Metals Group Limited
Moisture Content	M (%)	4	Harsco Metals Group Limited
Emission Factor PM_{10}	E (kg/tonne)	0.00046	E = k(PM_{10}) * 0.0016 * (U/2.2)1.3/(M/2)1.4
Emission Factor $PM_{2.5}$	E (kg/tonne)	0.00007	E = k($PM_{2.5}$) * 0.0016 * (U/2.2)1.3/(M/2)1.4

Control Techniques and Efficiencies	
Control Technique	The moistening of bulk materials by sprinkler irrigation is a practically proven technique to prevent dust formation from loading/unloading activities. The spraying can be carried out by using a permanent installation or mobile containers (*e.g.* tankers). Achieved environmental benefits: When spraying with water only, the estimated effectiveness is 80 – 98 %.

Source	AP42 - Chapter 13 - Section 13.2.4 (November 2006)		
Efficiency (%)	87%	BREF Emissions from Storage (July 2006), Section 4.4.6.8	
Emissions			
	Uncontrolled	**Controlled**	
PM_{10} (tonnes/year)	0.138	0.018	AP42 Volume 1 - E = A x EF x (1-ER/100)
$PM_{2.5}$ (tonnes/year)	0.021	0.003	AP42 Volume 1 - E = A x EF x (1-ER/100)

7.6.2 Asphalt Plant

The sources of potential fugitive emissions include emissions from diesel vehicles and plant and emissions of particulate due to materials handling and processing.

Emissions from diesel vehicles and plant – movement of diesel-powered vehicles (*i.e.* material handlers and road transport) in to and around the site. All plant and equipment shall be maintained in accordance with manufacturers recommendations. Where unplanned vehicle emissions are noted corrective actions shall be instigated.

Emissions of particulates – from the unloading and loading of materials within vehicles and the loading and unloading of materials into the stockpiles.

The following control measures are employed at the site to minimise the generation of dust and particulates:

- hard surfaced areas will be routinely swept to remove fines (with damping where appropriate); and
- the lowest possible drop heights are used when loading material into vehicles and unnecessary disturbance of the stockpiles will be avoided.

The site is not located in a particularly sensitive setting (with respect to dust) being located south of the main steelworks. The closest residential receptors to the site are located approximately 470 metres north (Willow Avenue) across the main steel works site (that forms the main part of the permitted installation). Willows mixed High School is in the same area approximately 450 metres north of the site.

7.6.3 Environmental Statement Air Quality Assessment

A formal assessment of air quality impacts has been undertaken by SLR Consulting Limited as part of the Environmental Impact Assessment. Their assessment concludes that *'both the construction and operational phases residual effects are negligible. Potential impacts on the Severn Estuary were considered not significant for both the construction and operational phase. The assessment concluded that the proposed development will have a negligible effect on the Severn Estuary'*.

A full copy of the Environmental Statement (ES) and associated technical assessment are provided with this permit variation.

7.7 Fugitive Emissions to Land, Surface Water, Sewer and Groundwater

7.7.1 Introduction

There are some types of emission that may cause pollution but do not have set limits within permit conditions. In permits these are called 'emissions not controlled by emissions limits' or fugitive emissions.

For there to be a potential impact there needs to be a source, pathway and receptor (**Figure 7-3**).

Figure 7-3: *Fugitive emissions (Source - Pathway - Receptor)*

The principal means of pollution prevention is the careful handling and storage of potentially polluting substances. In most cases this is determined by the level of containment of a substance, *i.e.* spill prevention. Three levels of containment have been considered:

- **Primary Containment** – *e.g.* a drum, vessel, pipe, bag, *etc.* containing the substance.
- **Secondary Containment** – *e.g.* a bund, double wall vessel or pipe, vent pipe, catch-pit *etc.* designed to retain the substance in the event of a failure of primary containment.

- **Tertiary Containment** – additional measures provided to contain an unplanned release (*e.g.* an oil interceptor in a surface water drain, a concrete hardstanding for road-tankers offloading to a bulk storage tank, *etc.*).

In all cases the actual technique (*i.e.* the physical control) is supplemented by effective management control through the development and use of appropriate operational procedures with the overall aim of breaking the S-P-R pollution linkage.

7.7.2 Sources

On-site sources that could lead to potential fugitive emissions to land, surface water, sewer or groundwater include:

- leaks and spills from the handling, storage and use of process chemicals, maintenance chemicals and vehicle and plant fuels;
- leaks and spills from on-site vehicles and plant during use and refuelling;
- loss of containment due to in-plant failure;
- losses to ground from the handling and loose storage of dry materials; and
- fire water run-off.

7.7.3 Pathways and Receptors

It is important to note that a pathway, such as groundwater, can be both a pathway and a receptor for site-derived fugitive emissions.

The Site Condition Report (SCR) (Ref. 018-1666 Celsa Cardiff Asphalt Variation - SCR REV00) indicates that the installation is directly underlain by:

- **Made Ground** – Made Ground (Undivided) - Artificial Deposit.
- **Superficial Deposits** – Tidal Flat Deposits - Clay, Silt and Sand.
- **Bedrock Deposits** – Mercia Mudstone Group – Mudstone.

From historical maps and information provided by Celsa representatives it is known that the site was reclaimed from the Severn Estuary in the 1960s. Reclamation materials comprised slag and other steel manufacturing waste materials from local steel manufacturing facilities, hence historic pollution (due to the nature of the fill materials) is likely to be present.

Hydrogeology

From a review of the environmental database, the hydrogeological deposits are classified as:

- **Made Ground** – Not classified.
- **Superficial Deposits** – Secondary Aquifer - Undifferentiated. Secondary Undifferentiated has been assigned in cases where it has not been possible to attribute either category A or B to a rock type. In most cases, this means that the layer in question has previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type.
- **Bedrock Deposits** – Secondary B Aquifer. These are predominantly lower permeability layers which may store and yield limited amounts of groundwater due to localised features such as fissures, thin permeable horizons and weathering. These are generally the water-bearing parts of the former non-aquifers.

The site is not within a groundwater Source Protection Zone (SPZ). The closest existing abstraction licence (Ref. 21/57/25/78) is operated by Celsa Manufacturing (UK) Ltd with a borehole located at ST 21350 76100. The water is used for process cooling and dust suppression as part of a steel works operation.

Hydrology

The site is located adjacent to the Cardiff Flats (edge of the Severn Estuary). There are no surface water abstractions associated with the site or any other site within 1-km.

7.7.4 Subsurface Structures

The operator has established and recorded the routing of all installation drains and subsurface pipework including identifying all sub-surface drainage sumps. Inspection and maintenance programmes for all subsurface structures (including the settlement lagoon) has been established and will be implemented as per the planned preventive maintenance schedule.

7.7.5 Site Surfacing

The operator has designed appropriate tertiary containment surfaces for all operational areas, taking into consideration collection surface water capacities, surface thicknesses, strength/ reinforcement; falls, materials of construction, permeability, resistance to chemical attack and inspection and maintenance procedures. The asphalt plant is zoned as follows:

- **Interim Aggregate Processing Area** – The interim aggregate processing area will remain unsurfaced.
- **Asphalt Plant Area** – The existing concrete hardstanding is to be replaced to serve the proposed asphalt plant area.
- **Lorry Delivery and Dispatch Route** – The existing unsurfaced track along which the asphalt plant will be accessed is to be retained and improved (with asphalt).

Where required (based on risk) the operational areas have been equipped with impervious surface, spill containment kerbs, sealed construction joints and a connection to a sealed drainage system that drains into the settlement lagoon. The lagoon would be subject to solids removal as and when required.

7.7.6 Above Ground Storage Tanks (ASTs)

The installation includes the following ASTs and silos (**Table *7-6***).

Table 7-6: *Installation ASTs and Silos*

Substance	Size and Volume	Control and Containment Measures
Imported Filler Silo (Limestone)	1 x 60 m^3	Imported filler silo is protected via a safety system incorporating a cut off valve in the silo fill pipe with electronic high-pressure switch, audio and visual alarms. No secondary containment required.
Reclaimed Filler Silo (Recovered particulates)	1 x 60 m^3	High level indicator. No secondary containment required.
Water tank	1 x 2.25 m^3	No secondary containment required.
Fibre Pellets silo	1 x 60 m^3	Mild steel silo 2.9 m x 9 m high with a 14-tonne capacity. Automatically operated venting system during silo filling process. No secondary containment required.

Substance	Size and Volume	Control and Containment Measures
Diesel Tank	N/A	No fuel storage is proposed within the extended asphalt permit boundary. Harsco would propose to use the existing diesel ASTs to refuel all mobile plant on site (associated with their operations).
Bitumen	3 x 60 t	Nominal tank capacity: 60 tonnes Construction: Cylindrical construction Material: Carbon steel BSEN10 025 grade Fe430B Energy efficiency: All surfaces are lagged with 60 kg/m^3 high density mineral wool. Tank insulated with 200mm thick mineral wool and clad with angular plastic-coated profiled sheeting. Cylinder: Fabricated in 6mm Tank base: Fabricated in 6mm Tank roof: Fabricated in 5mm Design pressure: Atmospheric Tank roof mounted capacitive high-level probe with control panel test facility. No secondary containment considered necessary due to the viscosity of the bitumen *i.e.* heating is required to move material from AST to the process. A small containment lip will be installed around the tanks. Designated spill kit and a shovel will be stored in a highly visible/accessible location near the tanks. In the unlikely event of a spillage the bitumen will be placed on the 'returned asphalt pile' and recycled through the asphalt plant. The tanks will be regularly inspected in accordance with the site maintenance programme.

All above-ground tanks containing liquids whose spillage could be harmful to the environment shall be bunded. Where bunds are provided they shall be impermeable and resistant to the stored materials, have no outlet and drain to a blind collection point, have pipework routed within the bunded areas with no penetration of contained surfaces, be designed to catch leaks from tanks or fittings and have a capacity greater than 110 percent of the largest tank or 25 percent of the total tankage (whichever is the large).

All storage areas will be subject to regular visual inspection and any contents pumped out or otherwise removed under manual control after checking for contamination. Where not frequently inspected, bunds shall be fitted with a high-level probe and an alarm (as appropriate).

Tanker connection points shall be located either within the bund or other provided adequate containment system.

All storage vessels shall be subject to programmed engineering inspection (normally visual) but extending to water testing where structural integrity is in doubt). This shall be dictated by manufacturers recommendations.

7.7.7 Storage areas for IBCs, drums, bags

The liquid bitumen and asphalt additive (Macfix S) would be stored on a standalone IBC portable bunds in-line with the *Control of Pollution (Oil Storage) (Wales) Regulations 2016*.

All storage areas shall be located away from watercourses and sensitive boundaries and should be protected against vandalism. The site (as a whole) is protected by a 2.4 m high palisade fence line within which the asphalt plant is centrally located.

Storage areas shall have appropriate signs and notices and shall be clearly marked out, and all containers and packages should be clearly labelled. All raw materials are supplied and stored in labelled UN approved containers. Incompatible substances shall be kept apart, segregated and/or isolated in-line with HSG71[12].

Where spillage of any stored substance could be harmful to the environment, the area shall be appropriately kerbed or bunded.

The maximum storage capacity of storage areas shall be stated (within management system documentation) and not exceeded, and the maximum storage period for containers should be specified and adhered to.

Containers shall be stored with lids, caps and valves secured and in place . This approach shall also be applied to nominally emptied containers.

All containers, drums and small packages should be regularly inspected (at least weekly). Procedures shall be in place to deal with damaged or leaking containers.

12 http://www.hse.gov.uk/pUbns/priced/hsg71.pdf

7.7.8 Management Controls

All on-site vehicles have diesel and hydraulic tanks. The total loss of the fuel/oil within these tanks is rare there is a potential risk. There is also a potential risk of spillage during refuelling operations, but this will only ever take place on the hard standing. Emergency spillage kits will be available and will be regularly inspected. The emergency spill kit training is provided to employees.

All accidents will be logged into the Incident Notification System, investigated and actions will be undertaken to prevent reoccurrence. The Harsco Procedure HM-P-017 Incident Report and Investigation provides guidance and ensure all incidents involving personal injury, damage to the environment or property, and near misses are properly reported, both internally and to the enforcing authorities and an appropriate level of investigation is undertaken.

The site environmental risk assessment along with the Disaster and Emergency Management Plan will be reviewed annually.

7.8 Odour

7.8.1 General Operations

Based upon the nature of the proposed operations, the wastes being stored, handled and treated and their location (in relation to sensitive receptors) no significant odour issues are anticipated. Thus, an odour management plan has not been produced.

Although the installation represents a very low risk, olfactory monitoring will be undertaken by Site staff as part of the weekly Site inspections. The presence or otherwise of any offensive odours shall be recorded in the Site Diary. If an odour is recorded, the possible source(s) shall be investigated by Site staff and preventative action taken. All actions taken shall be recorded within the Site Diary.

Celsa Manufacturing (UK) ltd believe that the operations give no reasonable cause for offence or annoyance regarding odour.

7.8.2 Asphalt Plant

PG3/15(12) section 5.1 lists potential odour sources from typical asphalt coating plants that are clearly unacceptable for both environmental and production reasons, namely:

- bitumen handling and storage;
- handling hot bitumen or coated roadstone;

- poor combustion of fuel oil;
- reclaimed asphalt when heated; and
- some additives may emit perceptible odours

Point Source Emissions

Odorous emissions have (in the past) been known to occur within the confines of the manufacturing process when the product was overheated within the plant mixer handling the final product. The subsequent odours were drawn into the exhaust and filtration plant and subsequently released to atmosphere through the stack. Similarly, this was often the case when firing on ageing dryer burners operating under restricted combustion air flows giving rise to poor fuel atomisation and combustion conditions. This resulted in subsequent blue smoke and odorous emissions. Poor combustion problems at the burner also allowed various stages of un-burnt fuel to be deposited on the product and within the plant internals and filtration plant where it lingered.

These types of problem have been eliminated by modern burner design and PC driven control systems that prevent burner start up unless all operational parameters in terms of air to fuel ratio, fuel supply pressures and adequate excess air, for complete combustion are met during the whole of its operating turn down cycle. Failure to meet these parameters during start up or shut down will initiate a burner flame lock out and subsequently the remainder of the plant being sequentially shut down until the problem is rectified. With these BAT solutions in place, it is expected that there will be no reasonable cause for nuisance from odours.

Fugitive Emissions

Odours of a local fugitive nature can arise from overheated bitumen fumes escaping from tank vents or from overheated coated product fumes when loading into road vehicles and subsequent transport from site. In the past, it has also been known to introduce wrong additives into the product also giving rise to odour problems.

Overheating of bitumen in the final coated mixed product is also unacceptable causing serious deterioration of the final product. Modern plants (such as the StarMix 4000) producing large quantities of asphalt materials operate within strict Quality Assurance (QA) regime together with appropriate control techniques that prevent unacceptable out of temperature specification problems. This strict control regime serves to prevent most odours at source.

Proprietary premixed modified bitumen is now universally used. Bitumen odours will be prevented by keeping maximum handling and heating temperatures within the limits set in

PG 3/15(12) and the various product specifications. Road planings containing coal tar shall not be treated in the plant.

8 Noise and Vibration

8.1 Introduction

An assessment, in-line with Horizontal Guidance for Noise Part 2 – Noise Assessment and Control (IPPC H3 – Part 2) and BS4142:2014 Methods for rating and assessing industrial and commercial sound has been undertaken by TNEI Services Ltd. The full impact assessment report (in-line with BAT requirements) is provided in *Annex E* with the key findings summarised below.

8.2 Guidance

The following guidance and standards have been considered as part of the assessment:

- general sector guidance;
- horizontal guidance for noise part 2 – noise assessment and control (IPPC H3 – Part 2);
- BS4142:2014 Methods for rating and assessing industrial and commercial sound; and
- specific local guidance (Cardiff Council).

8.2.1 Sector Guidance

Where noise issues are likely to be relevant, the operator is required, in the application, to provide information on the following:

- the main sources of noise and vibration associated with the installation;
- the nearest noise-sensitive sites;
- conditions/limits imposed under other regimes (*e.g.* planning);
- the local noise environment;
- any environmental noise measurement surveys, modelling or any other noise measurements; and
- any specific local issues and proposals for improvements.

The level of detail supplied should be in keeping with the risk of causing noise-related annoyance at sensitive receptors.

The Regulations require installations to be operated in such a way that *"all the appropriate preventative measures are taken against pollution, in particular through the application of BAT"*. The definition of pollution includes "emissions that may be harmful to human health or the quality of the environment, cause offence to human senses or impair or interfere with amenities and other legitimate uses of the environment". In the case of noise, "offence to any human senses" can normally be judged by the likelihood of complaints, but in some cases, it may be possible to reduce noise emissions still further at reasonable costs, and this may exceptionally therefore be BAT for noise emissions.

The indicative BAT requirements are to describe the main sources of noise and vibration (including infrequent sources); the nearest noise sensitive locations and relevant environmental surveys which have been undertaken; and the proposed techniques and measures for the control of noise.

The Operator should employ basic good practice measures for the control of noise, including adequate maintenance of any parts of plant or equipment whose deterioration may give rise to increases in noise (for example, bearings, air handling plant, the building fabric, and specific noise attenuation kit associated with plant or machinery).

The Operator should employ such other noise control techniques necessary to ensure that the noise from the installation does not give rise to reasonable cause for annoyance, in the view of the Regulator. In particular, the Operator should justify where Rating Levels ($L_{Aeq,T}$) from the installation exceed the numerical value of the background sound level ($L_{A90,T}$).

8.2.2 Horizontal Guidance Note H3 Part 2

This guidance document has been produced by the Environment Agency to provide guidance for dealing with permitting of noise and vibration emissions. Part 2 of the guidance provides information relating to the principles of noise measurement and prediction, and noise control techniques.

8.2.3 BS 4142:2014 Methods for Rating and Assessing Industrial and Commercial Sound

BS 4142:2014 describes methods for rating and assessing sound in order to provide an indication its likely impact upon nearby premises (typically residential dwellings) and is advocated as an appropriate assessment method in H3 Parts 2.

When considering the level of impact, BS 4142 emphasises the importance of the context in which a sound occurs. BS4142 takes great care in the use of the words sound and noise whereby sound can be measured by a sound level meter or other measuring system, whereas

noise is related to a human response and is routinely described as unwanted sound, or sound that is considered undesirable or disruptive.

The specific sound emitted from the Proposed Development (dB, L_{Aeq}) is rated by considering both the level and character (*i.e.* tonal elements, impulsivity, intermittency and distinctiveness) of the sound. This is achieved by applying appropriate corrections to the specific sound level externally at the receptor location, which gives the rating level of the sound in question. This is then assessed against the existing prevailing background sound level (dB, L_{A90}) at that location in order to determine a likely level of impact.

The level by which the rating level exceeds the prevailing background sound level indicates the following potential impacts (pp. 16 BS 4142:2014):

- a difference of +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context;
- a difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context; and
- the lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context.

The standard requires that consideration is given to the context in which the sound is experienced, and subjective judgement is applied to determine whether the impact is significant.

Updated 2018 guidance[13] states that an operator must write a noise and vibration management plan explaining how you'll prevent or minimise noise and vibration. This must be submitted if your risk assessment shows that your operation could cause pollution from noise or vibration beyond your site boundary.

8.2.4 Local Planning Guidance

TNEI report that Shared Regulatory Services (SRS) provide environmental protection and pollution control services to Cardiff Council and SRS expects applicants to aim for -10dB in their developments. We understand that this is a desired target rather than an absolute

13 Guidance Control and monitor emissions for your environmental permit - Noise and vibration management plan https://www.gov.uk/guidance/control-and-monitor-emissions-for-your-environmental-permit#noise-and-vibration-management-plan

requirement although where feasible this criterion should be met. In general, each scheme should be considered individually, and this is not a fixed criterion. This criterion has also not been published or formally adopted by the local authority.

8.3 Assessment Criteria

Based upon BS4142 criteria, and taking account of the aims of the Horizontal Guidance Notes, the following assessment criteria have been adopted for the purposes of this assessment:

- Significant Impact: BS4142 rating level of around +10 dB above the prevailing background level;
- Adverse Impact: BS4142 rating level of around +5 dB above the prevailing background level; and
- Low Impact: BS4142 rating level equal to, or below the prevailing background level.

In line with EPR requirements to demonstrate the application of Best Available Techniques (BAT), the Development should be designed and operated such that significant impacts are avoided, and adverse impacts are mitigated and minimised. Where the rating level equal to, or below the prevailing background level, a low impact is predicted, and no additional noise mitigation measures are considered necessary.

8.4 Receptors

The Site of the proposed development is located due south of the main Celsa steel making operations on the southern side of Rover Way (***Figure 8-1***).

Noise Sensitive Receptors (NSRs) are properties, people or fauna which are sensitive to noise and, therefore, may require protection from nearby noise sources. Many residential NSRs are located to the north of the wider Celsa site, with the closest NSRs being located at approximately 500 m northwest of the Proposed Development on Willows Avenue. A traveller site is located approximately 650 m to the north east on Rover Way. No nearby NSRs have been identified in any other directions. Noise Monitoring Locations (NMLs) have been selected after consultation with Cardiff City Council.

The Study Area has been defined through the identification of the closest NSRs to the development. Specifically, the study area is defined by the closest NSRs to the proposed development on the assumption that if noise levels are within acceptable levels at the closest receptors then it is reasonable to assume, they will also be acceptable at more distant locations.

Table 8-1: *Identified NSRs and NMLs used during the noise assessment*

ID	Description	Comments
NML1	Willow Avenue	Representative of closest NSRs to the North West on Willows Avenue.
NML2	Rover Way	Representative of NSRs within the traveller site on Rover Way
NML3	Runway Road	Representative of closest NSRs to north in the area of Pengam Green and Tremorfa Park.

Figure 8-1: *Surrounding environmental receptors (within 500 m)*

Google Earth Imaging with the permission of Google – Licensed to Earth and Marine Environmental Consultants Ltd.

8.5 Baseline Noise Assessment

A full description of the baseline noise assessment is outlined within *Annex E*.

The assessment has been made against the existing ambient sound levels, which were quantified through baseline noise level monitoring during early mornings, Sundays and regular weekday working hours.

During consultation with Cardiff Council it was agreed that if noise immission levels were predicted to be more than 10 dB below the existing noise levels then no further assessment would be necessary.

The assessment has determined that noise immission levels are likely to be more than 10dB below the existing noise levels at all receptor locations and for all proposed working periods. Accordingly, it is considered that the Proposed Development will not have an adverse noise impact on the local area.

8.6 Noise Control – Techniques and Technologies

Noise from process operations is largely controlled by localised enclosures associated with the plant and the implementation of procedures to ensure that noise is contained at source (as much as possible). The transferring of material is via enclosed conveyors, drop heights are minimised. Harsco will continual review opportunities for improvement to reduce noise via alternative location of mobile plant, parking, loading techniques in order to reduce the impact of brakes and gear changes.

Mobile and fixed plant in maintained in-line with manufacture's recommendations and a proactive planned preventative maintenance schedule will be established. Noise levels are considered when new equipment is purchased.

Complaints of noise from the local community are recorded and investigated to try to identify the source of the noise, if noise is attributed to an on-site source then action will be taken to rectify the issue.

8.7 Noise and Vibration Management Plan

Based upon the nature of the proposed operations and their location (in relation to sensitive receptors) no significant noise or vibration issues are anticipated. However, a noise and vibration management plan has been produced as outlined within *Annex F*. Celsa Manufacturing (UK) ltd believe that the installation gives no reasonable cause for offence or annoyance regarding noise and/or vibration.

9 Monitoring

9.1 Monitoring of emissions to air

9.1.1 Point source emissions to air – Asphalt Plant

As stated within *Section 4.4* dust collection from the dryer is via a primary system (skimmer) and secondary system (bag filter) with a capacity of 118,825 m^3/h. The outlet from the bag filter unit discharges to a stack 22 metres in height **(Emission point Ref: A5)**. The proposed monitoring requirements, aligned to Secretary of Stater Process Guidance Notes PG3/15(12) (Roadstone Coating Processes), are outlined in **Table *9-1***.

Table 9-1: *Asphalt Plant Emission Limit Values and Monitoring Requirements*

Source	Emission Limits	Type of Monitoring	Frequency
Site-wide Requirements			
Visible Emissions from site	No visible emissions to cross installation boundary	Direct observation by operator	Once a day
Visible Emission from permitted emission points	No abnormal emissions	Direct observation by operator	At all times
Droplets, mist, fume or smoke	No droplets, mist, fume or smoke darker than Ringelmann 1	Direct observation by operator	On start-up and then twice daily
Roadstone Coating Plant (Emission point Ref. A5)			
Particulate Matter	50 mg/m^3	PCME	Continuous Measurement of emissions Continuous recorded filter monitoring
Silos			
Particulate Matter	Designed to emit <10 mg/m^3 No visible emission	Operator observations at start/finish of delivery	Every delivery

Source	Emission Limits	Type of Monitoring	Frequency
Notes: The ELVs outlined within **Table *9-1*** are aligned to Secretary of Stater Process Guidance Notes PG3/15(12) (Roadstone Coating Processes). The reference conditions are 273.1 K, 101.3 kPa, without correction for water content. Visible emission do not include steam and condensed water vapour which are normal emissions from the process. Emission limits do not apply during start-up and shut down. Emissions should be kept to a minimum during these periods.			

9.2 Monitoring of emissions to surface water

There are no point source emissions to surface water from the installation. No monitoring is required.

9.3 Monitoring of emissions to sewer

There are no point source emissions to sewer from the installation. No monitoring is required.

9.4 Monitoring of emissions to groundwater

The emission to groundwater via the soakaway is solely derived from surface water run-off from the asphalt plant and associated material storage/handling area. There are two issues to address when considering the (potential) impact of the proposed development on the water environment and, in this case, groundwaters in particular:

- the quality of the runoff draining to the soakaway; and
- the potential impact of discharging runoff into made ground.

The silt that will be washed off the concrete hardstanding will be largely derived from the stockpiles of slag and the Made Ground which it is understood also largely comprises of slag. Surface water runoff will therefore be discharged via a soakaway into the Made Ground comprising largely of slag.

As the settlement lagoon will remove mobilised silt no on-going monitoring of emissions is proposed.

9.5 Monitoring of noise emissions

Based upon the nature of the proposed operations and their location (in relation to sensitive receptors) no significant noise or vibration issues are anticipated (*i.e.* the installation represents a low risk).

No formal on-going environmental noise surveys are therefore proposed.

9.6 Monitoring of odorous emissions to air

Based upon the nature of the proposed operations and their location (in relation to sensitive receptors) no significant odours are anticipated (*i.e.* the installation represents a low risk).

No formal odour monitoring is therefore proposed.

10 Environmental Risk Assessment

10.1 Introduction

This section of the technical submission provides an assessment of the environmental significance of the emissions from the installation by looking at the Site in the context of its environmental setting and UK guidance for such assessments.

The EA's Horizontal Guidance Note H1 (Environmental Assessment and Appraisal of BAT) was withdrawn on 1st February 2016. Thus, the 'Risks from your Site' information on the www.gov.uk website has been utilised throughout the assessment process[14]. The website outlines the following risk assessment stages:

- Stage 1 – Identify and consider risks for your site, and the sources of the risks.
- Stage 2 – Identify the receptors (people, animals, property and anything else that could be affected by the hazard) at risk from your site.
- Stage 3 – Identify the possible pathways from the sources of the risks to the receptors.
- Stage 4 – Assess risks relevant to your specific activity and check they're acceptable and can be screened out.
- Stage 5 – State what you'll do to control risks if they're too high.
- Stage 6 – Submit your risk assessment as part of your permit application.

10.2 Receptor Identification

The SCR which is provided within the application submission gives a detailed account of the environmental setting of the site, including physical conditions and environmental sensitivity. This is summarised in ***Table 10-1***.

14 https://www.gov.uk/government/collections/risk-assessments-for-specific-activities-environmental-permits

Table 10-1: *Summary of Principal Receptors*

Category	Description
Location	The site is located approximately 3-km east of Cardiff City centre at National Grid Reference (NGR) ST 21444 76235. The site is located south of the existing permitted installation that is located on the northern side of Rover Way. The following current activities have been identified surrounding the Site: • NORTH – Rover Way beyond which is the main Celsa Manufacturing (UK) site and permitted installation. A Western Power 132 kV substation is located adjacent to the northern edge of the site. The closest residential receptors to the site are located approximately 470 metres north (Willow Avenue) across the main steel works site (that forms the main part of the permitted installation). Willows mixed High School is in the same area approximately 450 metres north of the site. • EAST – Cardiff Motocross Centre MX and Minibike Track (Foreshore MXC track) beyond which is the Severn Estuary(200 metres). • SOUTH – Tide Fields Road beyond which a welsh Water waste water treatment works, and other light industrial activities associated with Tremorfa Industrial Estate. • WEST – Rover Way beyond which is the main Celsa Manufacturing (UK) site.
Site Surfacing	The Site topography is flat lying at approximately 10 metres Above Ordnance Datum (AOD). The Site is entirely hardstanding (within the installation) including all roadways and stockpile storage areas.
Surface waters	The site is located adjacent to the Cardiff Flats (edge of the Severn Estuary). There are no surface water abstractions associated with the site or any other site within 1-km.
Flood Plain	According to the NRW flood mapping the northern part of the site is within Flood Zone 3 (*i.e.* the extent of a flood from rivers with a 1% (1 in 100) chance or greater of happening in any given year and/or the extent of a flood from the sea with a 0.5% (1 in 200) chance or greater of happening in any given year) and Flood Zone 2 (*i.e.* the extent of a flood from rivers or from the sea with up to a 0.1% (1 in 1000) chance of happening in any given year, contains areas recorded to have flooded in the past and Flood Zone 2 is important from a planning context as it forms the basis of Zone C in the Welsh Government Development Advice Map).

Category	Description
Groundwater	The Mercia Mudstone Group (bedrock) is classified as a Secondary B Aquifer. These are predominantly lower permeability layers which may store and yield limited amounts of groundwater due to localised features such as fissures, thin permeable horizons and weathering. These are generally the water-bearing parts of the former non-aquifers. The site is not in a source protection zone (SPZ).
Residential areas and human receptors	The closest residential receptors to the site are located approximately 470 metres north (Willow Avenue) across the main steel works site (that forms the main part of the permitted installation). Willows mixed High School is in the same area approximately 450 metres north of the site.
Historic buildings, listed buildings and archaeological sites	According to Historic Wales there are no National Monuments, Cadw Listed buildings or scheduled ancient monuments on-site or within 500 metres.
Conservation and habitats protected areas and areas of scientific interest	The site is adjacent (within 250 metres) of the Severn Estuary, which is designated a Ramsar Site, Special Area of Conservation (SAC), Special Protection Area (SPA) and a Site of Special Scientific Interest (SSSI)

10.3 Environmental Impact Assessment

The asphalt process has been subject to an Environmental Impact Assessment (EIA) as required under the *Town and Country Planning (Environmental Impact Assessment) Regulations 2017*. A copy of the associated Environmental Statement (ES) is provided with this application (Ref. SLR 416.097604.00001).

10.4 Standard Risk Assessment

A suitable risk assessment, using the approach outlined within *Section 10.1*, has been undertaken for the slag processing and asphalt plant and is provided in *Annex G*.

A standalone assessment of the point source emission to air from the asphalt plant is provided in *Section 10.5* in-line with the Horizontal Guidance Note H1 (Environmental Assessment and Appraisal of BAT).

A specific risk assessment for the point source release to air is provided below.

10.5 Asphalt Plant – H1 Assessment Point Source Emissions to Air

An assessment of the environmental impact (to air) of the asphalt plant has been undertaken using the current H1 software (Version 2.7.6, February 2016). The input parameters are outlined in **Table *10-2***.

Table 10-2: *H1 input parameters*

Parameter	H1 Input	Source
Stack Ref.	A5	-
Effective height (m)	22	Plant supplier
Efflux velocity (m/s)	18.5	Plant supplier
Total flow (m^3/hr)	118,825	Plant supplier
Operating mode (%)	82	Harsco
Long Term Concentration (mg/m^3)	2.09	Annual daily average particulate emissions from the Harsco Rotherham site 2017 - 2019.
Short-term Concentration (mg/m^3)	2.09	Annual daily average particulate emissions from the Harsco Rotherham site 2017 - 2019.
PM_{10} ELV (24 hr mean) (mg/m^3)	50	AAD limit value
PM_{10} ELV (annual mean) (mg/m^3)	40	AAD limit value
$PM_{2.5}$ ELV (annual mean) (mg/m^3)	25 *1	AAD limit value

Note:

*1 Due to reduce to 20 mg/m^3 from 2020.

As no separate monitoring of PM_{10} and $PM_{2.5}$ are available from the Rotherham plant PCME PM (total) this has been used as a screening value for both PM_{10} and $PM_{2.5}$.

The site is not located within an AQMA.

10.5.1 Air Monitoring Background Data

Information concerning particulate (PM_{10} and $PM_{2.5}$) background concentrations has been obtained from Defra UK Air Information Resource. The data selected for the assessment has

been provided from the Cardiff Centre monitoring station (UK-AIR ID: UKA00217, EU Site ID: GB0580A)[15].

The monitoring station is located (altitude of 12 metres AOD) within a self-contained, air-conditioned housing located within a pedestrianised area (urban environment) at NGR 318416, 176526. The nearest road, the A4161 North Road is approximately 200 metres to the west of the station and is subject to periodic congestion during peak periods. The surrounding area comprises retail and business premises. The monitoring site is located approximately 3.1 km west of the asphalt plant.

The background data used within the H1 assessment is:

- Annual hourly average (18.51 μgm^{-3}) PM_{10} 2018 hourly measured (μgm^{-3}) from Cardiff Centre monitoring station; and
- Annual hourly average (10.16 μgm^{-3}) $PM_{2.5}$ 2018 hourly measured (µgm-3) from Cardiff Centre monitoring station.

The air emissions inventory from H1 is outlined in **Figure *10-1***.

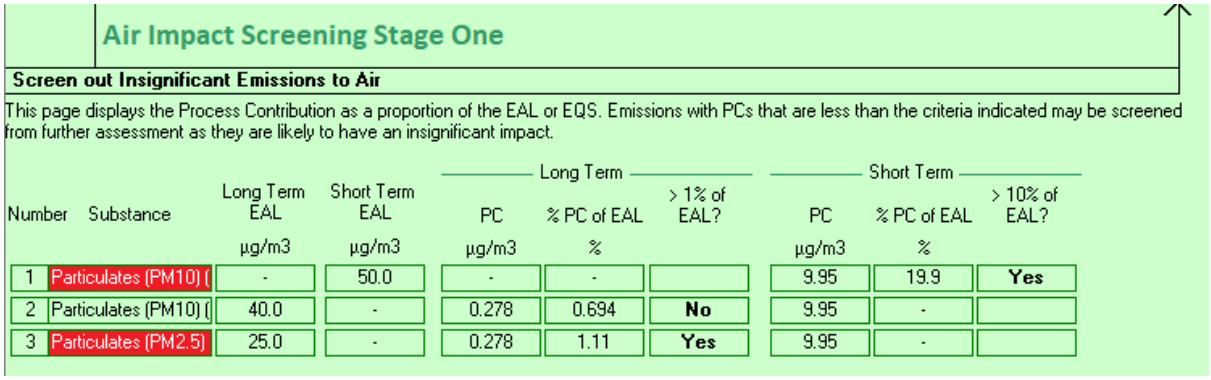
Air Emissions Inventory

Please list all Substances released to Air for each Release Point identified in the previous page.

Number	Substance	Meas'ment Method	Operating Mode (% of Year)	Data relating to Long Term effects			Data relating to Short Term effects			Annual Rate	ELV Conc.
				Conc. mg/m3	Release Rate g/s	Meas'ment Basis	Conc. mg/m3	Release Rate g/s	Meas'ment Basis	tonne/yr	mg/m3
e.g.	sulphur dioxide	Estimated*	70% load	1510	3000	annual avg	1510	3000	hourly avg	55,000	2000
1	Particulates (PM10) (24 hr Mean)	Continuo	82.0%				2.1	0.068985	24 hr Mean		50.00
2	Particulates (PM10) (Annual Mean)	Continuo	82.0%	2.1	0.068985	Annual mear				1.7839	40.00
3	Particulates (PM2.5)	Continuo	82.0%	2.1	0.068985	Annual Mear				1.7839	25.00

Figure 10-1: *Air emissions inventory*

15 https://uk-air.defra.gov.uk/networks/site-info?uka_id=UKA00217



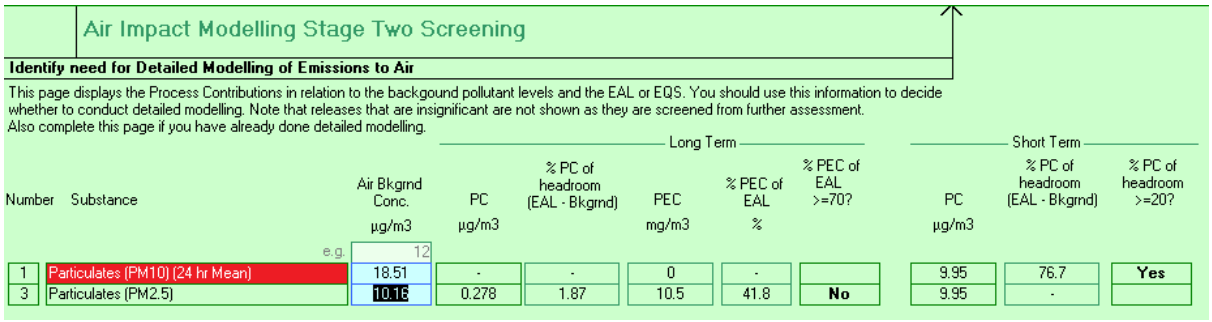
Air Impact Screening Stage One

Screen out Insignificant Emissions to Air

This page displays the Process Contribution as a proportion of the EAL or EQS. Emissions with PCs that are less than the criteria indicated may be screened from further assessment as they are likely to have an insignificant impact.

Number	Substance	Long Term EAL µg/m3	Short Term EAL µg/m3	Long Term PC µg/m3	Long Term % PC of EAL %	Long Term > 1% of EAL?	Short Term PC µg/m3	Short Term % PC of EAL %	Short Term > 10% of EAL?
1	Particulates (PM10) (	-	50.0	-	-		9.95	19.9	Yes
2	Particulates (PM10) (	40.0	-	0.278	0.694	No	9.95	-	
3	Particulates (PM2.5)	25.0	-	0.278	1.11	Yes	9.95	-	

Figure 10-2: *Air impact screening stage one*



Air Impact Modelling Stage Two Screening

Identify need for Detailed Modelling of Emissions to Air

This page displays the Process Contributions in relation to the backgound pollutant levels and the EAL or EQS. You should use this information to decide whether to conduct detailed modelling. Note that releases that are insignificant are not shown as they are screened from further assessment.
Also complete this page if you have already done detailed modelling.

Number	Substance	Air Bkgrnd Conc. µg/m3	Long Term PC µg/m3	Long Term % PC of headroom (EAL - Bkgrnd)	Long Term PEC mg/m3	Long Term % PEC of EAL %	Long Term % PEC of EAL >=70?	Short Term PC µg/m3	Short Term % PC of headroom (EAL - Bkgrnd)	Short Term % PC of headroom >=20?
	e.g.	12								
1	Particulates (PM10) (24 hr Mean)	18.51	-	-	0	-		9.95	76.7	Yes
3	Particulates (PM2.5)	10.16	0.278	1.87	10.5	41.8	No	9.95	-	

Figure 10-3: *Air impact screening stage two*

The potential impacts of PM_{10} emissions on the 24-hour mean standard are not insignificant and the screening approach (**Figure 10-3**) indicates that detailed modelling may be required. However, given the precautionary dispersion factors applied, the background being *circa* 20% of the EAL *i.e.* almost 80% headroom beneath the limit value, and the absence of relevant exposure locations within 500 metres of the emission point, the risk of an exceedance of the Limit Value at a relevant exposure location is considered sufficiently low and no further assessment has been undertaken or is indeed warranted. In addition, the site is not located within an Air Quality Management Area (AQMA).

It is important to consider that the performance standard of the plant exceeds the BAT ELV requirement *i.e.* the plant meets a 20 mg/m^3 level whilst the particulate ELV is set at 50 mg/m^3.

A copy of the H1 assessment (Microsoft Access database) is provided with the application.

Annex A: Figures

Annex B: Technical Documents – Slag Processing

Annex C: Technical Documents – Asphalt Plant

Annex D: Management System Documentation

Annex E: Noise Impact Assessment

Annex F: Noise and Vibration Management Plan

Annex G: Environmental Risk Assessments