# Main Installation Report (Permit Variation) Celsa Manufacturing (UK) Ltd, Tremorfa Melt Shop, Tremorfa Works, Seawall Road, Cardiff, CF24 5TH (Permit number: EPR/TP3639BH - PAN-026085)

On behalf of:
Celsa Manufacturing (UK) Ltd

Project Reference:
025-1994

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| 00 | 13/06/24 | MS | SPR | First issue to Celsa and Harsco (Asphalt Plant Operator) |
| 01 | 24/01/25 | MS | SPR | Revision to include DOB & QT activity |
| | | | | |
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## Bibliography

European Comission. (2013). *Best Available Techniques (BAT) Reference Document for Iron and Steel Production.* Retrieved from https://eippcb.jrc.ec.europa.eu/sites/default/files/2019-11/IS_Adopted_03_2012.pdf

European Commission. (2012). *2012/135/EU: 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.* Retrieved from https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32012D0135&from=EN

## Abbreviations

| | |
|---|---|
| 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 |
| mg/l | milligrams per litre |
| NGR | National Grid Reference |
| NRW | Natural Resources Wales |
| Opra | Operational Risk Appraisal |
| 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 as required under Regulation 20 of the *Environmental Permitting (England and Wales) Regulations 2016 (as amended)* concerning current activities and proposed activities to be undertaken at Tremorfa Melt Shop. Tremorfa Works, Seawall Road, Cardiff, CF24 5TH (Permit No. EPR/TP3639BH).

The Authorised company contact is Gabriella Nizam (Celsa Manufacturing (UK) Ltd, Head of Sustainability & Public Affairs).

The status log (history) for the permit is outlined in ***Table 1-1***.

**Table 1-1:** *Tremorfa 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. |
| Application PAN-000449. Variation determined EPR/TP3639BH/**V004**. | 20/07/2016 | Application to vary permit to add waste codes. |

| Description | Date | Comments |
|---|---|---|
| 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. |
| Application for variation PAN-005161 Variation determined EPR/TP3639BH/**V007**. | 09/07/2019 | Application to increase the shearing scrap metal limit to 5000 tonnes per month. |
| Application for variation EPR/TP3639BH/**V008** (PAN-005485) | 07/02/2020 | Application to consolidate waste permit EPR/DP3699FM, add integrated recycling centre, remove Carbon Monoxide limit and update/increase permit boundary. |
| Variation application EPR/TP3639BH/**V009** (PAN-008611) | 05/05/2020 | Application to add asphalt plant and slag processing. |
| Variation Application PAN-018725 (EPR/TP3639BH/**V010**) | 02/06/2024 | Application for substantial variation to add a new metal shredder and shear as a S5.4 Part A1 (b) iv activity. |
| **Note:** This table only provides details of the main permit-related events. The status log should be referred to for full details. | | |

### 1.1.1 Permitted Boundary

The current permit boundary is outlined in Schedule 7 of the environmental permit. There are **no changes** to the permit boundary required concerning this variation application. A revised Site Condition Report (SCR) has not been submitted.

The application has been produced following Natural Resources Wales (NRW), Environment Agency (EA) and Department for Environment, Food & Rural Affairs (Defra) guidance as outlined within the original permit application.

# 2 Permitted Activities

## 2.1 Proposed Variation

The proposed variation relates to two specific areas of the existing permitted installation:

- **Asphalt Plant (variation of operating hours)** – Proposal to bring the asphalt plant into line with the rest of the melt shop activities (i.e. allow operation 24 hours per day, seven days per week, for up to 52 weeks per year with planned maintenance occurring as and when required).
- **Melt Shop (addition of new Directly Associated Activity)** – Processing of the Drop Out Box and Quench Tower (DOB & QT) material through screening and milling to improve material recovery options/rates.

### 2.1.1 Asphalt Plant

The proposed variation relates solely to the operation of the asphalt plant (Chapter 3, S3.5 Part B (e)) and the directly associated activity (DAA) slag processing operations (that feed the asphalt plant) that were added to the permit via EPR/TP3639BH/V009 (PAN-008611).

Schedule 1 – Table S.1. Activity A3 of the current permit (EPR/TP3639BH/V010) includes the following operational limits:

- The asphalt plant shall not be used except between the hours of 06:00 - 17:00 daily.

The operator wishes to extend the potential operating period to:

- The asphalt plant can operate 24 hours per day, seven days per week, for up to 52 weeks per year with planned maintenance occurring as and when required.

This proposed change aligns the asphalt plant with the Chapter 2, S2.1, Part A(1)(b)(i) Electric Arc Furnace (EAF) that can operate 24 hours per day, seven days per week, for up to 52 weeks per year with planned maintenance occurring as and when required.

The proposed change will allow the operator to operate in a more flexible manner allowing it to support a wider range of customer requests. It is important to note that the plant will not (necessarily) operate continually but rather as and when demand requires it.

### 2.1.2 Drop-Out Box and Quench Tower Processing

The proposal is to install a fully enclosed activity to collect and process DOB & QT materials. A small building (composed of an existing structure with a new small extension) is to be located between the existing electrical supply building and the large de-dust plant (**Figure *2-1***).

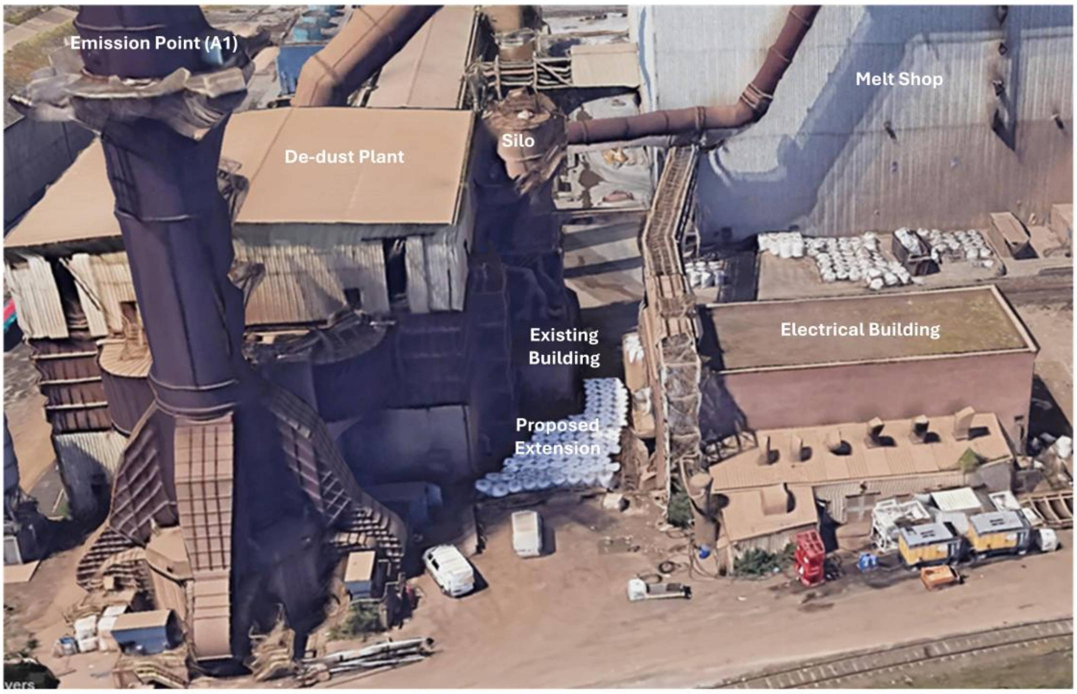


**Figure 2-1:** *Proposed activity location*

The new building is significantly lower than either the existing electrical supply building or the de-dust plant. It will not be visible from the north at all (due to the existing screening provided by the surrounding buildings).

This is not deemed a Schedule 1 activity as it is a Directly Associated Activity (DAA) linked to the main stationary Technical Unit (STU) i.e. the Chapter 2, S2.1, Part A(1)(b)(i) activity.

# 3 Operations – Asphalt Plant

## 3.1 Slag Crushing and Screening

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 melting 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. To reduce this potential expansion, the slag must undergo controlled conditioning, or 'weathering'. It can be crushed and screened in the same manner as 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.

Best available techniques (BAT) refer to 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.

**No changes to the existing slag crushing and screening processes are proposed. The previously supplied BAT assessment remains valid.**

## 3.2 Asphalt Plant

The installed asphalt plant is a Parker StarMix 4000, 320 tonnes per hour (tph) static batch production asphalt plant. The plant is 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.

**No changes to the existing asphalt plant are proposed. The previously supplied BAT assessment remains valid.**

### 3.2.1 Delivery and Storage of Materials

The asphalt process involves the importation and storage of a range of raw materials such as aggregate (steel slag), aggregate (natural *i.e.* Limestone), Aggregate (Reclaimed Asphalt Pavement), bitumen, filler, fibre pellets and additives.

Note: The reference to RAP in the permit application refers to returned 'surplus' asphalt or non-conforming product which is fed back into the process. Customers often order extra asphalt than is required this is returned and fed back into the process. RAP which has been removed from roads **is not used** as an input material.

The material inputs and outputs from the asphalt process are outlined in **Table *3-1***. It is important to note that these are the same (estimated) volumes as stated in the original application. The original estimates (for Year 5 of operation) should be sufficient to meet the required demand associated with the more flexible operating hours.

**Table 3-1:** *Material inputs and predicted volumes – asphalt plant*

| Source/ Destination | Material | Year 1 (estimated) | Year 5 (estimated) | 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 |

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

The proposed stockpile capacities are outlined in **Table *3-2***. It is important to note that these are the same volumes as stated in the original application. The original estimates should be sufficient to meet the required demand associated with the more flexible operating hours.

**Table 3-2:** *Stockpiled materials – capacity by area*

| Crushing and Screening Plant | | Asphalt Plant | |
|---|---|---|---|
| Processed slag (>3 mm) | 2,000 – 4,000 tonnes | Slag/Natural Stone (> 3 mm) | 2,000 tonnes |
| Processed slag (≤ 3 mm) | 600 – 1,200 tonnes | Slag/Limestone (≤ 3 mm) | 600 tonnes[1] |
| **Notes:**<br>[1] Bay storage with cover | | | |

## 3.3 Initial storage and loading

Five large, covered concrete storage bays accommodate the bulk storage of materials for the plant (*i.e.* 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 is placed adjacent to the storage bays.

**No changes to the storage arrangements (*i.e.* number of bays or volumes stored) are required to meet BAT.**

# 4 Operations – DOB & QT Processing

## 4.1 Introduction

In the Electric Arc Furnace (EAF) process the majority of the total emissions during a cycle are contained in the primary off gas, which is extracted from the furnace via a hole in the furnace roof.

A dropout box is initially used to remove large particulate matter from the exhaust gases before they proceed to further filtration and cooling stages.

- **Slow Gas Flow** – The exhaust gases from the EAF enter the dropout box, where the flow velocity is significantly reduced.
- **Gravity Separation** – Due to the reduced velocity, heavier particles and larger dust settle out of the gas stream by gravity.
- **Collection** – These settled particles are collected at the bottom of the dropout box for removal.
- **Cleaner Gas Exit** – The cleaner gases then exit the dropout box and move on to additional pollution control equipment, such as quench towers and filters.

This process helps reduce the load on downstream filtration systems and improves the overall efficiency of dust collection in the EAF system (e.g. reducing sedimentation within the downstream ducts).

A quench tower in an EAF system is used to rapidly cool down hot gases produced during the steelmaking process.

- **Hot Gas Entry** – The hot gases from the EAF enter the quench tower.
- **Cooling Process** – Inside the tower, these gases are cooled down using water sprays (evaporative cooling).
- **Heat Transfer** – The cooling water absorbs the heat from the gases, causing the water to evaporate and the gas temperature to drop significantly.
- **Gas Conditioning** – As the gases cool, particulates, acid gases, and other contaminants condense and can be removed more easily in subsequent pollution control equipment.

- **Settling Chamber –** The cooled gases then pass through a settling chamber where heavier dust particles settle out due to gravity.

- **Exit** – The cooled and conditioned gases then exit the quench tower, ready for further treatment.

These processes generate a lower grade metal-laden dust that has (until now) been subject to storage and off-site disposal (to landfill) leading to increased business costs and reduced environmental performance concerning the application of the waste hierarchy (**Figure *4-1***).


**Figure 4-1:** *Waste hierarchy defined under the WFD*

The primary purpose of this Project is to improve the physical characteristics of the DOB & QT materials to enable integration within the other existing (economically viable) process streams thereby allowing increased recovery.

## 4.2 Process

The proposed process flow is outlined in **Figure *4-2***.

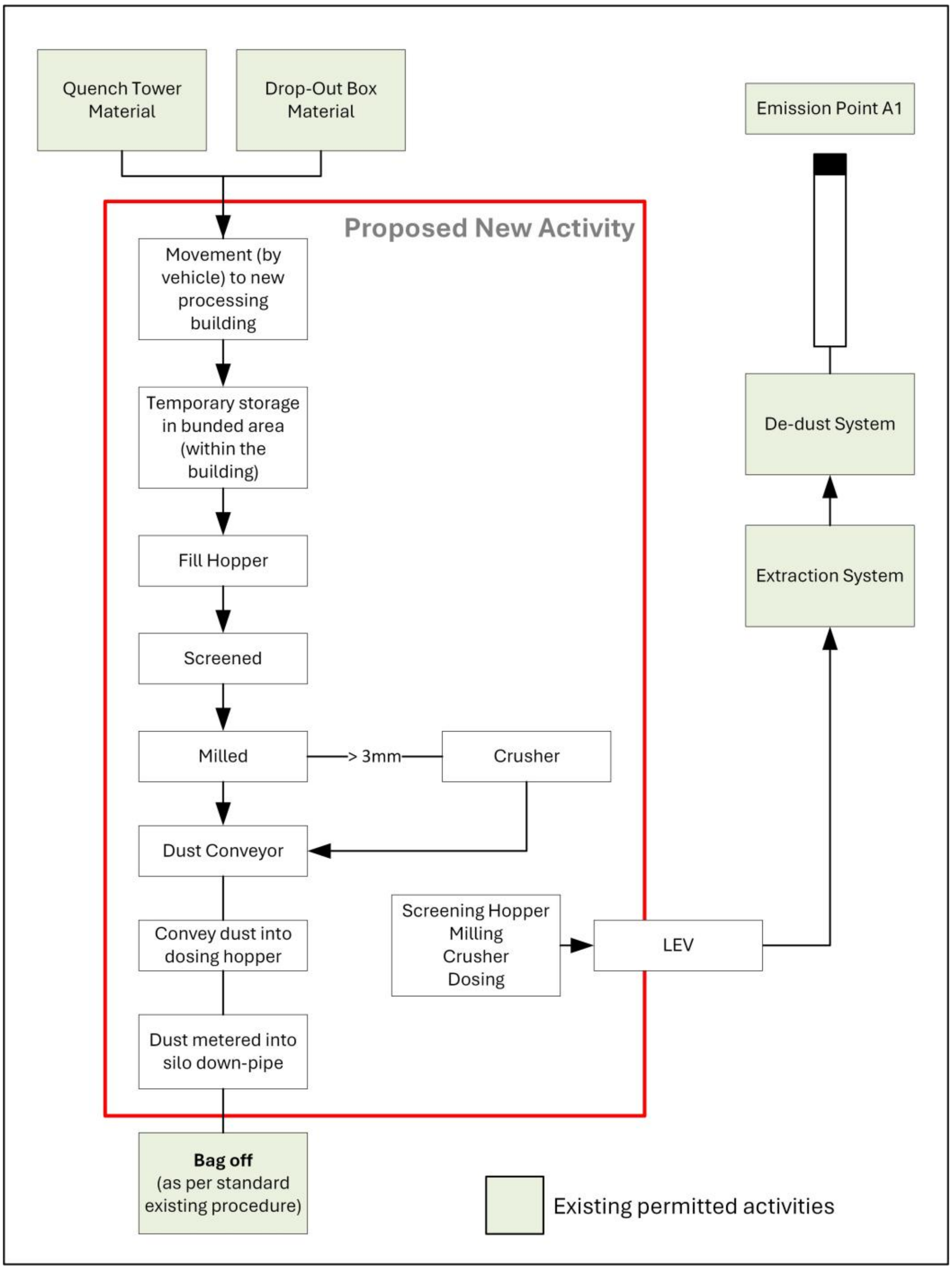


**Figure 4-2:** *DOB and QT Processing*

### 4.2.1 Stage 1 – Material collection

The materials from the quench tower and drop-out box will be collected and moved to the new DOB & QT Processing area (several times a week) using the existing handling and collection systems.

Celsa is currently reviewing the use of open-topped skips as they present a source of fugitive emissions during loading (**Section 7.8**). The use of open topped skips isn't considered Best Available Technology (BAT) when compared to BAT 11 (IX) (European Commission, 2012).

### 4.2.2 Stage 2 – Material storage within the processing area

The collected DOB & QT materials will be deposited onto hardstanding within a bunded area within the wholly enclosed and fully extracted processing area (**Photograph *4-1***). The area can contain approximately a week's worth of DOB & QT materials (based on current production rates).


**Photograph 4-1:** *Proposed location of building extension*

### 4.2.3 Stage 3 – Materials loaded into the processing hopper

The DOB & QT materials stored in the internal bund will then be moved using a telehandler (**Error! Reference source not found.**) and placed within the enclosed 12 $m^3$ hopper that can hold c. 7 tonnes of material at any one time. It is anticipated that the weekly expected volume of DOB & QT material from the EAF will be processed at any one time.

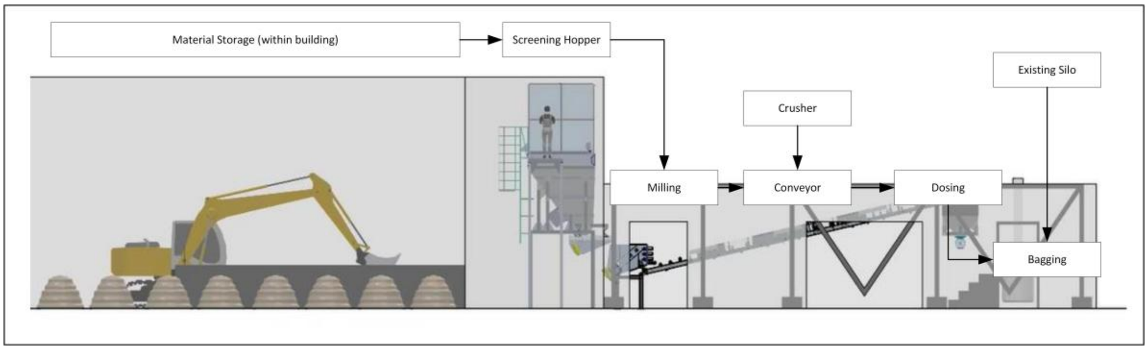


**Figure 4-3:** *Process flow with building*

### 4.2.4 Stage 4 – Material Screening

The DOB & QT materials that have been loaded into the feed hopper are then subjected to screening. The output from the screening stage passes to the milling equipment. Materials greater than 3 mm would be rejected from the conveyor.

### 4.2.5 Stage 5 – Milling

The screened materials are then subject to milling (as per the agreed specification) before entering onto a conveyor. Materials greater than 3 mm would be rejected from the conveyor.

### 4.2.6 Stage 5a – Crusher

Celsa proposes to install (during Phase 2 of the Project) an adjacent crusher to process oversized materials > 3mm. Once processed the size-reduced materials would then be deposited back onto the conveyor.

### 4.2.7 Stage 6 – Dosing Hopper

The conveyor would then deposit the processed materials into a 1 $m^3$ (0.5 tonne) dosing hopper.

### 4.2.8 Stage 7 – Bagging

To ensure specifications are met the dosing hopper will discharge into the bulk bags combined with the existing silo materials to ensure a 10% dilution rate (i.e. 10% of the processed DOB & QT materials are mixed with 90 % of the silo materials per bag).

The storage silo and bagging equipment already form part of the permitted installation.

**Photograph 4-2:** *Existing building under refurbishment (with cladding removed)*

## 4.3 Residual Management

The process will generate small volumes of metallic residual elements (scrap metal) that will be collected within a small container. A forklift truck will be used to remove the container (maximum of twice a week). The removed materials will be returned to the scrap yard for inclusion within the EAF input materials.

## 4.4 Building and Existing Facilities

The existing building and extended foundations are currently undergoing full refurbishment. This includes full weather proofing, cladding repair/replacement, the installation of two new roller shutter doors and the installation of a fire detection and alarm system. The detection system is currently under design but will include both flame detection and rate or rise heat detectors.

The renewal programme also includes refurbishing and repurposing the old extraction system to provide both general and local extraction capabilities. Emissions from the process will be fully controlled with the main receiving hopper fitted with a fixed duct and sensor-controlled damper for direct extraction during loading and the crusher/screener system will be covered by local receptor hoods whilst all being housed entirely within the enclosed building. Other controls will include:

- Installing a matrix of discrete air washes to maximize dust capture during processing.
- Weatherproofing and sealing the existing building to create a fully enclosed environment, minimising dust escape.
- Ensuring all dust handling operations are contained within enclosures.
- All operations will only take place during daylight hours.

## 4.5 Process Control

The DOB & QT process will be programmable logic controller (PLC) adapted for the control of the manufacturing process. The human–machine interaction (HMI) is to be located adjacent to the dosing and bagging process.

## 4.6 Drainage

There will be no new drainage installed as part of the Project. The activity does not need or require water and there will be no discharge to drain of any kind.

Once completed there will be single drain cover within the new building. This is currently sealed and will remain sealed (i.e. there is no pathway from within the building).

# 5 Managing the Activities

## 5.1 Overall Permit Management

Celsa Manufacturing (UK) Ltd has implemented and maintains an Environmental Management System (EMS) that is certified to ISO14001:2015 (Certificate No. ES113432).

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.

Celsa Manufacturing (UK) Ltd also operates a certified ISO 45001:2018 Occupational health and safety management system and a certified ISO9001:2015 quality management system.

Harsco (as the operator of the asphalt plant) has established and maintains the required EMS as stated within the original application.

**No changes to the existing management system are required to meet BAT.**

## 5.2 Operations and Maintenance

The company 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 and/or increased energy or resource consumption will be 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.

All new equipment associated with the DOB & QT process will be incorporated into the current system.

## 5.3 Accidents

As part of the design process Celsa undertook a high-level environmental risk assessment for the proposed DOB & QT process change (**Table *5-1***).

**Table 5-1:** *DOB & QT Environmental Risk Assessment*

| Activity | Hazard | Initial Risk | Current Controls | Residual Risk |
|---|---|---|---|---|
| Movement of DOB & QT materials to the processing building (open top skips) | Environmental dust release | Moderate | Drop heights limited<br>Improvement Required to meet BAT 11 (IX) (European Commission, 2012) | Moderate |
| Dust handling within the building | Dust release inside the building | Moderate | Refurbish and seal the building and ensure proper functioning of the extraction system; install air-washes to enhance dust capture. | Low |
| Loading hopper via front loader | Dust release during loading (inside the building) | Moderate | Install a fixed duct with a sensor-controlled damper that activates extraction during loading; ensure enclosure is maintained. | Low |
| Operation of crusher, milling and screener | Noise and dust during operation | Moderate | Enclose crusher/screener and operate only during daylight hours to minimise noise impact; ensure proper extraction.<br>All activities are located within a newly refurbished/ fully enclosed building.<br>Roller shutter doors to closed during plant operation. | Low |

| Activity | Hazard | Initial Risk | Current Controls | Residual Risk |
|---|---|---|---|---|
| Bagging of blended dust | Potential dust leakage (within the building) | Low | Ensure the bagging system is enclosed; conduct regular inspections for potential dust leaks. | Very Low |
| General maintenance of equipment | Exposure to dust during maintenance | Moderate | Provide PPE (respirators, goggles) and ensure local extraction is operational during maintenance activities. | Low |
| Transport of bagged dust off-site | Spillage during loading for transport | Low | Ensure proper sealing of bags; use spill kits and train staff on spill response procedures. | Very Low |
| Commissioning of new equipment | Operational issues or malfunctions during testing | Moderate | Conduct phased commissioning and regular monitoring; have contingency measures in place for potential issues. | Low |
| Plant operation | Fire (e.g. electrical components) | Low | Installation of flame detection and rate of riser heat detectors. Flame alarm system to be integrated into existing system. | Very Low |

The site has established and maintains an Accident Management 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.

The current accident plan (CPB032 Emergency Plan) and associated action plans (ECP34 Emergency Action Plans) are live documents within the EMS which are subject to review and update.

The management of accidents, Incidents, complaints, and non-conformances are managed through the existing processes that form part of the ISO 14001 EMS.

## 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

There are multiple levels of security to prevent/control unauthorised access to the Site. The entrance point is secured and maintained by security staff and a CCTV system has been installed which includes remote monitoring and provides full-service maintenance. Escalation (*i.e.* post-detection/alarm response) is provided.

## 5.6 Staff Competence

Celsa Manufacturing (UK) Ltd will provide centralised engineering, technical, transport, administration, and environmental support (as required). 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.

## 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.

## 5.8 Access to your 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 will be initiated:

- disconnection of electrical supply and make safe;
- drain down and empty any tanks;
- remove all plant and equipment down to slab level;
- remove and dispose of all remaining waste materials in line with current regulatory requirements; and
- undertake site surrender SCR monitoring (*i.e.* provide the evidence necessary to demonstrate to NRW that the site does not pose a pollution risk and is in a satisfactory state).

# 6 Energy and Climate Change

## 6.1 Introduction

The proposed DOB & QT process includes the installation of various small items of electrically powered equipment (e.g. screener, crusher, milling machine, conveyor). At the current time the rating of the equipment is not available from the supplier, but it is expected to be minimal.

The implications of the variation for the asphalt plant are outlined below.

## 6.2 Electricity Use

The asphalt plant electrical specifications were outlined within the original permit application.

### 6.2.1 Current Permit

The current (permitted) operating hours of the asphalt plant are 10 hours per day, five days a week (6 am to 4 pm) with weekend operation (as required). It was anticipated that there could 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).

### 6.2.2 Proposed Operations

The proposed operating hours of the asphalt plant are 24 hours per day, seven days a week. This assumes that there will be operations occurring 365 days per year (100% utilisation). This is considered highly unrealistic but is required for customer flexibility (*Section 2.1*).

The estimated annual operating hours are therefore 8760 (assuming 24 hours per day for 365 days). This equates to an annual total of 8322 MW (based on constant operation/load).

## 6.3 Natural 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 (nominal heat input of 19,500 kW) associated with the dryer can run on natural gas and gas oil. The natural gas fuel capacity is 1870 $m^3$/h (est. calorific value 45,600 kJ/$m^3$).

The plant is run solely on natural gas. Gas oil backup has not been 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 the use of the 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 considers 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 in **Table 6-*1***.

**Table 6-1:** *Energy sources and annual consumption*

| Source | Type | Delivered (MWh/year) | Conversion Factor | Primary (MWh/year) |
|---|---|---|---|---|
| Electricity from public supply | Indirect emissions | 8,322 | 2.4 | 19,973 |
| Natural gas | Direct emissions | 207,495 | 1.0 | 207,495 |
| **Total** | | **215,817** | | **227,468** |
| **Notes:** The proposed operating hours of the asphalt plant are 24 hours per day, seven days a week. This assumes that there will be operations occurring 365 days per year (100% utilisation). This is considered highly unrealistic but is required for customer flexibility. The estimated annual operating hours are therefore 8760 (assuming 24 hours per day for 365 days). This equates to an annual total of 8322 MW (based on constant operation/load). | | | | |

## 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 in **Table *6-2***.

**Table 6-2:** *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 | 8,322 | 0.17 | 1,415 |
| Natural gas | Direct emissions | 207,495 | 0.23 | 42,724 |
| **Total** | | **215,817** | | **44,139** |
| **Notes:** The proposed operating hours of the asphalt plant are 24 hours per day, seven days a week. This assumes that there will be operations occurring 365 days per year (100% utilisation). This is considered highly unrealistic but is required for customer flexibility. The estimated annual operating hours are therefore 8760 (assuming 24 hours per day for 365 days). This equates to an annual total of 8322 MW (based on constant operation/load). | | | | |

As stated previously, the 100% utilisation is highly unrealistic but is required for customer flexibility.

## 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 an annual basis. Furthermore, on a six-monthly basis, each Harsco site must report its environmental metrics which include 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 of 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.

**No changes to the existing energy management system are required to meet BAT.**

# 7 Emissions to Air, Water and Land

## 7.1 Asphalt – Point Source Emissions to Air

As per the original application, the outlet from the asphalt bag filter unit discharges to a stack 22 metres in height **(Emission point Ref: A5)**.

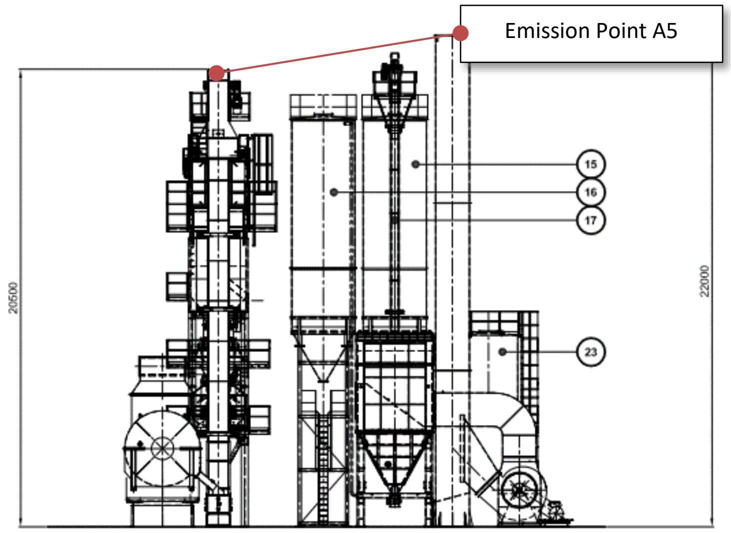


**Figure 7-1:** *Emission point A5 - Asphalt Plant*

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

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

The revised operational periods and the associated impacts are assessed within the provided Air Emissions Risk Assessment **(Annexe B)**.

## 7.2 DOB and QT – Point Source Emissions to Air

The new DOB & QT process is to be fully enclosed within a partially refurbished/new building extension. The initial screening hopper is to be fully enclosed with local exhaust ventilation (LEV) fitted whilst allowing loading using a material handler (on one side).

The milling machine receives the discharge from the screener which is to be fitted with a hood that is connected to the LEV system. During Phase 2 of the Project, a crusher is to be installed adjacent to the Milling Machine to deal with fragments greater than 3 mm. Once installed this will also be fitted with a hood that is connected to the LEV system. The final stage (post the internal conveyor) is the dosing equipment. This will also be fitted with a hood that is connected to the LEV system. All LEV associated with the activity will be connected to the existing system located adjacent to the processing area which in turn is connected to the de-dusting plant that ultimately discharges to the atmosphere via emission point A1 (**Figure 7-2**).

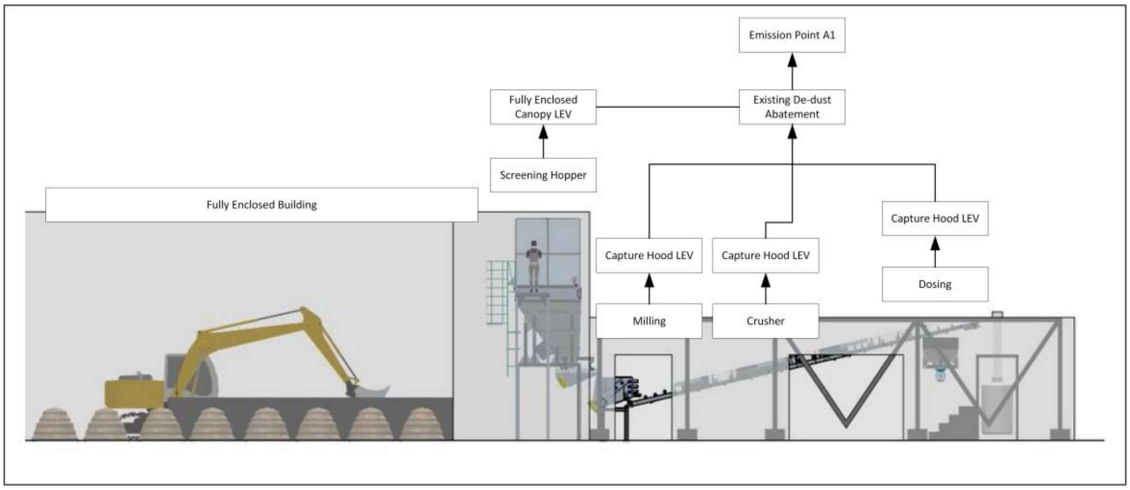


**Figure 7-2:** *Air handling and LEV associated with the DOB & QT Process*

The connection of the DOB & QT process will not alter the emission characteristics of emission point A1; therefore, an updated Air Emissions Risk Assessment is not deemed necessary.

## 7.3 Point Source Emissions to Surface Water

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

## 7.4 Point Source Emissions to Sewer

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

## 7.5 Point Source Emissions to Groundwater

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

## 7.6 Point Source Emissions to Land

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

## 7.7 Asphalt – Fugitive Emissions to Air

### 7.7.1 Surfacing

No changes to the current surfacing arrangements are proposed. Controls to minimise the lift-off of material between surfaced and unsurfaced areas have been established and are maintained.

### 7.7.2 Material handling (stockpiles)

BAT, as defined within the BAT conclusions iron and steel production[1], 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)[2].

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 the 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

1 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)

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

facilitate the 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:

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

Where:

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 the storage area;
- wind erosion of pile surfaces and ground areas around piles; and

- loadout of aggregate for shipment or 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 consist 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 *7-1***. The revised assessment has been adjusted for the proposed increased operating hours. As stated previously, the 100% utilisation is highly unrealistic but is required for customer flexibility.

**Table 7-1:** *Fugitive Dust Emissions Assessment (Material Handling – Stockpiles)*

| | |
|---|---|
| **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 | 24 | Harsco Metals Group Limited |
| **Annual workdays** | day/year | 365 | Harsco Metals Group Limited |
| **Annual Total** | tonnes/year | 876,000 | 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) | 0.404 | 0.053 | AP42 Volume 1 - E = A x EF x (1-ER/100) | |
| $PM_{2.5}$ (tonnes/year) | 0.061 | 0.008 | AP42 Volume 1 - E = A x EF x (1-ER/100) | |

The site has layout has been designed to limit the distance between the source of the aggregate (*i.e.* the crushing and screening plant) and the Asphalt Plant (transport distance of approximately 200 metres). Material will be wetted/sprayed before loading. The damp material will be transported via a wheeled loader. The wheeled loader will be required to adhere to the site speed limit of 10 mph. It will be required to travel with the bucket low to the ground when travelling or tipping as per Harsco's procedure 'WI-CE-MIN-1664 - Mineral Site Loading Shovel Duties'. In adverse weather *e.g.* dry and strong winds blowing eastwards towards sensitive receptors such activity may be restricted and/or stopped.

As described above material will be wetted and speed limits/loader travel restrictions will be enforced. Asphalt is shipped from the site in covered trucks and deliveries of limestone will be in covered vehicles. Installation imports and exports will make use of internal roadways.

A hand shovel and skid steer are available to clean under and around screens and conveyors, and a good standard of housekeeping is to be followed. Housekeeping audits form part of routine checks. Harsco will seek the use of a road sweeper for surfaced areas and a bowser is also available.

Clean dust/fines deemed suitable for reuse will be fed back into the feed stockpile. Water will be available to dampen down the stockpile before loading (if required). The material will then be fed carefully into the 'Feed-bin' of the Asphalt Plant which is enclosed by a canopy to prevent dust emissions. All conveyor systems and transfer points are fully enclosed.

**No changes to the existing dust management controls are required to meet BAT.**

### 7.7.3 Slag Crushing and Screening Activity

There are no stated US EPA specific Emission Factors (EF) for the processing or handling of EAF-derived slag.

NRW requested that the same EF process be applied to the actual crushing/screening activity using US EPA 11.19.2 Crushed Stone Processing and Pulverized Mineral Processing (August 2004). It is important to note that this AP42 section relates to natural rock rather than EAF-generated slag.

The EAF slag (to be processed) is placed in appropriately sized piles adjacent to the processing equipment. The material is loaded into a vibrating inclined screen called the scalping screen. This unit separates oversized material from the smaller material. The processed slag that is too large to pass through the top deck of the scalping screen is processed in the secondary (cone) crusher. The output from the secondary crusher is then passed through the finishing/trommel screen.

The AP42 (11.19.2) process defines two assessment types depending on moisture content, uncontrolled and controlled:

- Uncontrolled – this refers to processing material with a moisture content below 1.5%; and
- Controlled – this refers to processing material, either naturally wet with a moisture content above 1.5% or moistened to 1.5% and above using a wet suppression technique.

As stated in the application moisture control of stockpiles and in-process materials is to be applied (*e.g.* use of spray bars). On the basis that moisture control is to be applied the controlled EFs have been utilised within the assessment. The predicted total releases for the processing of the EAF slag (using secondary crushing and screening) are outlined below.

**No changes to the existing dust management controls are required to meet BAT.**

The predicted throughput volumes stated in **Table 7-2** are the same as per the original application. Harsco operates a 'replenish just in time' approach rather than building up large on-site stockpiles.

**Table 7-2:** *Fugitive Dust Assessment (Mobile Screening and Crushing Plant)*

| Input Data (Controlled) | | |
|---|---|---|
| Process | Throughput (tonnes) | Activity |
| Secondary Crushing | 300,000 | Material processed |
| Screening | 300,000 | Material processed |

| Secondary Crushing | | | | | |
|---|---|---|---|---|---|
| Substance | Emission Factor (EF) | EF Units | Throughput (tonnes) | Total Release | Units |
| TPM - Controlled* | 0.0006 | kg/tonne | 300,000 | 0.1800 | tonnes |
| PM10 - Controlled* | 0.00027 | kg/tonne | 300,000 | 0.0810 | tonnes |
| PM2.5 - Controlled* | 0.00005 | kg/tonne | 300,000 | 0.0150 | tonnes |

| Screening | | | | | |
|---|---|---|---|---|---|
| Substance | Emission Factor (EF) | EF Units | Throughput (tonnes) | Total Release | Units |
| TPM - Controlled* | 0.0011 | kg/tonne | 300,000 | 0.3300 | tonnes |
| PM10 - Controlled* | 0.00037 | kg/tonne | 300,000 | 0.1110 | tonnes |
| PM2.5 - Controlled* | 0.000025 | kg/tonne | 300,000 | 0.0075 | tonnes |

| Total Release (tonnes/year) | | |
|---|---|---|
| Substance | Total release | Units |
| Total Particulate Matter (TPM) | 0.510 | tonnes/year |
| Particulate Matter (PM10) | 0.192 | tonnes/year |
| Particulate Matter (PM2.5) | 0.023 | tonnes/year |

### 7.7.4 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 – the movement of diesel-powered vehicles (*i.e.* material handlers and road transport) into and around the site. All plant and equipment shall be maintained following 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.

A formal Dust Management Plan (DMP) has been established and is maintained by Harsco. In addition, Celsa has produced a DMP for the existing scrap yard (Ref. ECP52 Cardiff Scrap Yard Dust Management Plan) and an overarching Rover Way DMP (Ref. ECP53) that incorporates all activities on this part of the installation, including the Mineral Site.

**No changes to the existing dust management controls are required to meet BAT.**

### 7.7.5 Management of Moisture Content

Before crushing and screening the slag is sprayed in the cooling pits. Before the transfer of processed material to the asphalt plant (if dry) it is sprayed.

The material has a residual moisture content but where required is wetted (sprayed from the on-site bowser) before crushing and screening. There are suppression facilities in the cone and conveyor of the crusher. These are not interlocked as this could lead to the material being too wet. As an operator, there is a need to balance resource use and dust suppression. Where required, these in-built suppression facilities can be connected to a water source (the on-site bowser) to provide additional suppression. Water is available for suppression within the crushing and screening process area.

**No changes to the existing management controls are required to meet BAT.**

## 7.8 DOB & QT – Fugitive Emissions to Air

The current and proposed situations (concerning fugitive emissions to air) are summarised in ***Figure 7-3***.

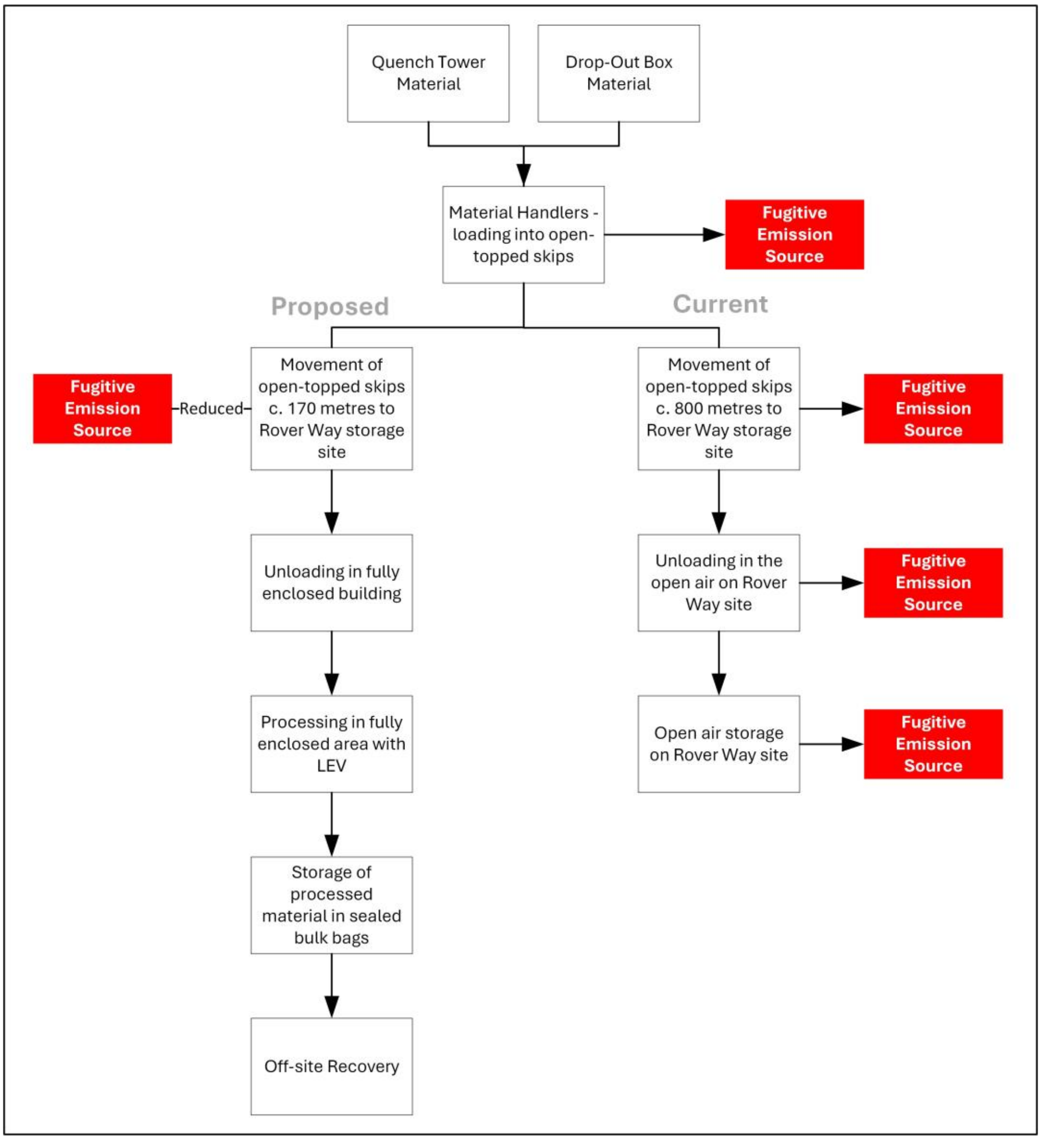


**Figure 7-3:** *DOB & QT fugitive air emissions (current and proposed)*

The proposed implementation of the DOB & QT process will significantly reduce the potential release of fugitive dust emissions into the air from the handling and storage of DOB and QT-derived materials through:

- reduced travel distances (170 metres instead of 800 metres);
- processing with a fully enclosed building fitted with LEV; and
- storage within sealed bulk bags.

Celsa is currently reviewing the use of open-topped skips (**Error! Reference source not found.**) for the initial handling and transport of the DOB & QT material. It is expected that a solution will be implemented that should negate most of the fugitive dust emissions associated with handling and transport activities.

The area within the processing building is likely to be designated a respiratory protective equipment (RPE) area but the concept is for there to be minimal local emissions (within the building) during the handling activities.

The proposals are in line with the BAT requirements outlined in the current BAT Reference (European Comission, 2013) and BATC Guidance (European Commission, 2012).

## 7.9 Fugitive Emissions to Land, Surface Water, Sewer & Groundwater

There are no changes to the existing arrangements associated with the proposed variation.

## 7.10 Odour

There are no changes to the existing arrangements associated with the proposed variation.

# 8 Noise and Vibration

## 8.1 Introduction

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 the 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 Asphalt – Noise Impact Assessment

TNEI was commissioned by Harsco to undertake an environmental Noise Impact Assessment (NIA) to support the proposed extension of operating hours of the Steelphalt site. The NIA is provided in **Annexe A**.

The report concludes that it is considered that the extension of operational hours of the Steelphalt site to include night-time operation will not have an adverse noise impact on the local area.

## 8.3 DOB & QT – Noise Impact Assessment

The DOB & QT processing will occur within a new fully refurbished and enclosed building located between two large existing structures (i.e. de-dust plant and electrical building). The plant is relatively minor in size and scale and is effectively screened by the surrounding buildings. No new external plant is to be installed as part of the Project.

All existing equipment (e.g. silos, bag-filling equipment and air-handling extraction systems) are part of the current noise baseline. Therefore, given the size, scale and location of the proposed activity, a revised noise impact assessment has not been undertaken.

All management system controls remain in operation.

# 9 Monitoring

## 9.1 Monitoring of emissions to air

### 9.1.1 Point source emissions to air

No changes are required because of the proposed variation.

### 9.1.2 Monitoring of Fugitive Dust Emissions

No changes are required because of the proposed variation.

## 9.2 Monitoring of emissions to surface water

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

No changes are required because of the proposed variation.

## 9.3 Monitoring of emissions to sewer

No changes are required because of the proposed variation.

## 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.

No changes are required because of the proposed variation.

## 9.5 Monitoring of noise emissions

No changes are required because of the proposed variation.

## 9.6 Monitoring of odorous emissions to air

No changes are required because of the proposed variation.

**No changes to the existing monitoring arrangements are required to meet BAT.**

# 10 Environmental Risk and Impact 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.

Updated assessments for the asphalt plant have only been provided where the proposed operational extension period is considered relevant *i.e.* air emissions and noise impacts. All previous risk and impact assessments remain valid and unchanged.

No additional environmental risk or impact assessments are deemed necessary for the proposed DOB & QT process.

## 10.2 Asphalt – Noise Impact Assessment

TNEI was commissioned by Harsco to undertake an environmental Noise Impact Assessment
(NIA) to support the proposed extension of operating hours of the Steelphalt site.

The report (Ref. 16195-001-R0) concludes that it is considered that the extension of operational hours of the Steelphalt site to include night-time operation will not have an adverse noise impact on the local area.

The NIA is provided in **Annexe A**.

*No actions have been identified.*

## 10.3 Asphalt – Air Emissions Risk Assessment (AERA)

SLR Consulting Limited (SLR) has been commissioned by Harsco Metals Group Limited to undertake an Air Emissions Risk Assessment (AERA) to support their Environmental Permit
variation application (Ref. SLR Project No.: 422.065025.00001).

The conclusions of the AERA are as follows:

- the overall effect on air quality is considered ‘not significant’; and

- the emissions from the plant are considered to cause ‘no likely significant effect’ to the Ramsar, SPA and SAC sites, ‘no likely damage’ to the SSSI and ‘no significant pollution’ to the SINC sites.

The AERA is provided in **Annexe B**.

*No actions have been identified.*

## Annexe A: Asphalt – Noise Impact Assessment

**Please refer to the standalone report Ref. 025-1994 Annexe A 16195-001-R0 Steelphalt NIA**

# Annexe B: Asphalt – Air Emissions Risk Assessment (AERA)

**Please refer to the standalone report Ref. 025-1994 Annexe B 422.065025.00001 - Celsa Steelphalt - AERA v1.0**

# Annexe C: BAT Assessment (DOB & QT Process)

# BAT Assessment - Industrial emissions for iron and steel production

**Project:** 025-1994
**Site:** Celsa Manufacturing (UK) Ltd, Tremorfa Melt Shop, Tremorfa Works, Seawall Road, Cardiff, CF24 5TH
**Permit Ref.** EPR/TP3639BH
**Source:** https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32012D0135

EAME Earth & Marine Environmental Consultants

| BAT-C Statements | Description and Assessment | BAT Assessment |
|---|---|---|
| 1.1. *General BAT Conclusions*<br>Unless otherwise stated, the BAT conclusions presented in this section are generally applicable. | | |
| The process specific BAT included in the Sections 1.2 – 1.7 apply in addition to the general BAT mentioned in this Section. | | |
| 1.1.1. Environmental management systems<br>1. BAT is to implement and adhere to an environmental management system (EMS) that incorporates all of the following features:<br>I. commitment of management, including senior management;<br>II. definition of an environmental policy that includes continuous improvement for the installation by the management;<br>III. planning and establishing the necessary procedures, objectives and targets, in conjunction with financial planning and investment;<br>IV. implementation of the procedures paying particular attention to:<br>(i) structure and responsibility<br>(ii) training, awareness and competence<br>(iii) communication<br>(iv) employee involvement<br>(v) documentation<br>(vi) efficient process control<br>(vii) maintenance programmes<br>(viii) emergency preparedness and response<br>(ix) safeguarding compliance with environmental legislation;<br>V. checking performance and taking corrective action, paying particular attention to:<br>(i) monitoring and measurement (see also the Reference Document on the General Principles of Monitoring)<br>(ii) corrective and preventive action<br>(iii) maintenance of records<br>(iv) independent (where practicable) internal and external auditing in order to determine whether or not the EMS conforms to planned arrangements and has been properly implemented and maintained;<br>VI. review of the EMS and its continuing suitability, adequacy and effectiveness by senior management;<br>VII. following the development of cleaner technologies;<br>VIII. consideration for the environmental impacts from the eventual decommissioning of the installation at the stage of designing a new plant, and throughout its operating life;<br>IX. application of sectoral benchmarking on a regular basis.<br>**Applicability**<br>The scope (e.g. level of details) and nature of the EMS (e.g. standardised or non-standardised) will generally be related to the nature, scale and complexity of the installation, and the range of environmental impacts it may have. | Celsa Manufacturing (UK) Ltd has implemented and maintains an Environmental Management System (EMS) that is certified to ISO14001:2015 (Certificate No. ES113432). 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. | Meets BAT |
| 1.1.2. Energy management<br>2. BAT is to reduce thermal energy consumption by using a combination of the following techniques:<br>I. improved and optimised systems to achieve smooth and stable processing, operating close to the process parameter set points by using<br>(i) process control optimisation including computer-based automatic control systems<br>(ii) modern, gravimetric solid fuel feed systems<br>(iii) preheating, to the greatest extent possible, considering the existing process configuration.<br>II. recovering excess heat from processes, especially from their cooling zones<br>III. an optimised steam and heat management<br>IV. applying process integrated reuse of sensible heat as much as possible.<br>In the context of energy management, see the Energy Efficiency BREF (ENE).<br>**Description of BAT I.i**<br>The following items are important for integrated steelworks in order to improve the overall energy efficiency:<br>— optimising energy consumption<br>— online monitoring for the most important energy flows and combustion processes at the site including the moni- toring of all gas flares in order to prevent energy losses, enabling instant maintenance and achieving an undisrupted production process<br>— reporting and analysing tools to check the average energy consumption of each process<br>— defining specific energy consumption levels for relevant processes and comparing them on a long-term basis<br>— carrying out energy audits as defined in the Energy Efficiency BREF, e.g. to identify cost-effective energy savings opportunities.<br>**Description of BAT II – IV**<br>Process integrated techniques used to improve energy efficiency in steel manufacturing by improved heat recovery include:<br>— combined heat and power production with recovery of waste heat by heat exchangers and distribution either to other parts of the steelworks or to a district heating network<br>— the installation of steam boilers or adequate systems in large reheating furnaces (furnaces can cover a part of the steam demand)<br>— preheating of the combustion air in furnaces and other burning systems to save fuel, taking into consideration adverse effects, i.e. an increase of nitrogen oxides in the off-gas<br>— the insulation of steam pipes and hot water pipes<br>— recovery of heat from products, e.g. sinter<br>— where steel needs to be cooled, the use of both heat pumps and solar panels<br>— the use of flue-gas boilers in furnaces with high temperatures<br>— the oxygen evaporation and compressor cooling to exchange energy across standard heat exchangers<br>— the use of top recovery turbines to convert the kinetic energy of the gas produced in the blast furnace into electric power.<br>**Applicability of BAT II – IV**<br>Combined heat and power generation is applicable for all iron and steel plants close to urban areas with a suitable heat demand. The specific energy consumption depends on the scope of the process, the product quality and the type of installation (e.g. the amount of vacuum treatment at the basic oxygen furnace (BOF), annealing temperature, thickness of products, etc.). | The proposed DOB & QT process includes the installation of various small items of electrically powered equipment (e.g. screener, crusher, milling machine, conveyor). At the current time the rating of the equipment is not available from the supplier, but it is expected to be minimal.<br><br>All existing controls remain in operation with respect to energy management. | Meets BAT |
| 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.<br>**Description**<br>Process integrated techniques to improve energy efficiency in an integrated steelworks by optimising process gas utili- sation include:<br>— the use of gas holders for all by-product gases or other adequate systems for short-term storage and pressure holding facilities<br>— increasing pressure in the gas grid if there are energy losses in the flares – in order to utilise more process gases with the resulting increase in the utilisation rate<br>— gas enrichment with process gases and different calorific values for different consumers<br>— heating fire furnaces with process gas<br>— use of a computer-controlled calorific value control system<br>— recording and using coke and flue-gas temperatures<br>— adequate dimensioning of the capacity of the energy recovery installations for the process gases, in particular with regard to the variability of process gases.<br>**Applicability**<br>The specific energy consumption depends on the scope of the process, the product quality and the type of installation (e.g. the amount of vacuum treatment at the BOF, annealing temperature, thickness of products, etc.). | Not applicable to the DAA. | 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.<br>**Applicability**<br>The cooperation and agreement of a third party may not be within the control of the operator, and therefore may not be within the scope of the permit. | Not applicable to the DAA. | N/A |
| 5. BAT is to minimise electrical energy consumption by using one or a combination of the following techniques:<br>I. power management systems<br>II. grinding, pumping, ventilation and conveying equipment and other electricity-based equipment with high energy efficiency.<br>**Applicability**<br>Frequency controlled pumps cannot be used where the reliability of the pumps is of essential importance for the safety of the process. | The proposed DOB & QT process includes the installation of various small items of electrically powered equipment (e.g. screener, crusher, milling machine, conveyor). At the current time the rating of the equipment is not available from the supplier, but it is expected to be minimal. | Meets BAT |

**BAT Assessment** - Industrial emissions for iron and steel production

**Project:** 025-1994
**Site:** Celsa Manufacturing (UK) Ltd, Tremorfa Melt Shop, Tremorfa Works, Seawall Road, Cardiff, CF24 5TH
**Permit Ref.** EPR/TP3639BH
**Source:** https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32012D0135

| BAT-C Statements | Description and Assessment | BAT Assessment |
|---|---|---|
| 1.1.3. Material management<br>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.<br>**Description**<br>Appropriate storage and handling of input materials and production residues can help to minimise the airborne dust emissions from stockyards and conveyor belts, including transfer points, and to avoid soil, groundwater and runoff water pollution (see also BAT 11).<br>The application of an adequate management of integrated steelworks and residues, including wastes, from other instal- lations and sectors allows for a maximised internal and/or external use as raw materials (see also BAT 8, 9 and 10).<br>Material management includes the controlled disposal of small parts of the overall quantity of residues from an integrated steelworks which have no economic use. | The primary purpose of this Project is to improve the physical characteristics of the DOB & QT materials to enable integration within the other existing (economically viable) process streams thereby allowing increased recovery. | Meets BAT |
| 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).<br>To improve the use of scrap, the following techniques can be used individually or in combination:<br>— specification of acceptance criteria suited to the production profile in purchase orders of scrap<br>— having a good knowledge of scrap composition by closely monitoring the origin of the scrap; in exceptional cases, a melt test might help characterise the composition of the scrap<br>— having adequate reception facilities and check deliveries<br>— having procedures to exclude scrap that is not suitable for use in the installation<br>— storing the scrap according to different criteria (e.g. size, alloys, degree of cleanliness); storing of scrap with potential release of contaminants to the soil on impermeable surfaces with a drainage and collection system; using a roof which can reduce the need for such a system<br>— putting together the scrap load for the different melts taking into account the knowledge of composition in order to use the most suitable scrap for the steel grade to be produced (this is essential in some cases to avoid the presence of undesired elements and in other cases to take advantage of alloy elements which are present in the scrap and needed for the steel grade to be produced)<br>— prompt return of all internally-generated scrap to the scrapyard for recycling<br>— having an operation and management plan<br>— scrap sorting to minimise the risk of including hazardous or non-ferrous contaminants, particularly polychlorinated biphenyls (PCB) and oil or grease. This is normally done by the scrap supplier but the operator inspects all scrap loads in sealed containers for safety reasons. Therefore, at the same time, it is possible to check, as far as practicable, for contaminants. Evaluation of the small quantities of plastic (e.g. as plastic coated components) may be required<br>— radioactivity control according to the United Nations Economic Commission for Europe (UNECE) Expert Group framework of recommendations<br>— implementation of the mandatory removal of components which contain mercury from End-of-Life Vehicles and Waste Electrical and Electronic Equipment (WEEE) by the scrap processors can be improved by:<br>— fixing the absence of mercury in scrap purchase contracts<br>— refusal of scrap which contains visible electronic components and assemblies.<br>**Applicability**<br>The selection and sorting of scrap might not be entirely within the control of the operator. | Not applicable to the DAA. | N/A |
| 1.1.4. Management of process residues such as by-products and waste<br>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).<br>**Description**<br>Techniques for the recycling of iron-rich residues include specialised recycling techniques such as the OxyCup® shaft furnace, the DK process, smelting reduction processes or cold bonded pelletting/briquetting as well as techniques for production residues mentioned in Sections 9.2 – 9.7.<br>**Applicability**<br>As the mentioned processes may be carried out by a third party, the recycling itself may not be within the control of the operator of the iron and steel plant, and therefore may not be within the scope of the permit. | The primary purpose of this Project is to improve the physical characteristics of the DOB & QT materials to enable integration within the other existing (economically viable) process streams thereby allowing increased recovery. | Meets BAT |
| 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 residues which can neither be avoided nor recycled. | The primary purpose of this Project is to improve the physical characteristics of the DOB & QT materials to enable integration within the other existing (economically viable) process streams thereby allowing increased recovery. | Meets 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. | The new DOB & QT process is to be fully enclosed within a partially refurbished/new building extension. The initial screening hopper is to be fully enclosed with local exhaust ventilation (LEV) fitted whilst allowing loading using a material handler (on one side). The milling machine receives the discharge from the screener which is to be fitted with a hood that is connected to the LEV system. During Phase 2 of the Project, a crusher is to be installed adjacent to the Milling Machine to deal with fragments greater than 3 mm. Once installed this will also be fitted with a hood that is connected to the LEV system. The final stage (post the internal conveyor) is the dosing equipment. This will also be fitted with a hood that is connected to the LEV system. All LEV associated with the activity will be connected to the existing system located adjacent to the processing area which in turn is connected to the de-dusting plant that ultimately | Meets BAT |
| 1.1.5. Diffuse dust emissions from materials storage, handling and transport of rawmaterials and (intermediate) products<br>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 below.<br>If abatement techniques are used, BAT is to optimise the capture efficiency and subsequent cleaning through appropriate techniques such as those mentioned below. Preference is given to the collection of the dust emissions nearest to the source. | | |
| I. General techniques include: | | |
| — the setting up within the EMS of the steelworks of an associated diffuse dust action plan; | | Meets BAT |
| — consideration of temporary cessation of certain operations where they are identified as a source of $PM_{10}$ causing a high ambient reading; in order to do this, it will be necessary to have sufficient $PM_{10}$ monitors, with associated wind direction and strength monitoring, to be able to triangulate and identify key sources of fine dust. | | Meets BAT |
| II. Techniques for the prevention of dust releases during the handling and transport of bulk raw materials include: | | |
| — orientation of long stockpiles in the direction of the prevailing wind | | N/A |
| — installing wind barriers or using natural terrain to provide shelter | | N/A |
| — controlling the moisture content of the material delivered | | N/A |
| — careful attention to procedures to avoid the unnecessary handling of materials and long unenclosed drops | | Meets BAT |
| — adequate containment on conveyors and in hoppers, etc. | | N/A |
| — the use of dust-suppressing water sprays, with additives such as latex, where appropriate | | N/A |
| — rigorous maintenance standards for equipment | | Meets BAT |
| — high standards of housekeeping, in particular the cleaning and damping of roads | | Meets BAT |
| — the use of mobile and stationary vacuum cleaning equipment | | N/A |
| — dust suppression or dust extraction and the use of a bag filter cleaning plant to abate sources of significant dust | | Meets BAT |
| — the application of emissions-reduced sweeping cars for carrying out the routine cleaning of hard surfaced roads. | | Meets BAT |
| III. Techniques for materials delivery, storage and reclamation activities include: | | |
| — total enclosure of unloading hoppers in a building equipped with filtered air extraction for dusty materials, or hoppers should be fitted with dust baffles and the unloading grids coupled to a dust extraction and cleaning system | | Meets BAT |
| — limiting the drop heights if possible to a maximum of 0,5 m | | Meets BAT |
| — the use of water sprays (preferably using recycled water) for dust suppression | | N/A |
| — where necessary, the fitting of storage bins with filter units to control dust | | N/A |
| — the use of totally enclosed devices for reclamation from bins | | N/A |
| — where necessary, the storage of scrap in covered, and hard surfaced areas to reduce the risk of ground contamination (using just in time delivery to minimise the size of the yard and hence emissions) | | N/A |
| — minimisation of the disturbance of stockpiles | | N/A |
| — restriction of the height and a controlling of the general shape of stockpiles | | N/A |
| — the use of in-building or in-vessel storage, rather than external stockpiles, if the scale of storage is appropriate | | Meets BAT |
| — the creation of windbreaks by natural terrain, banks of earth or the planting of long grass and evergreen trees in open areas to capture and absorb dust without suffering long-term harm | | N/A |
| — hydro-seeding of waste tips and slag heaps | | N/A |

# **BAT Assessment** - Industrial emissions for iron and steel production

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**Permit Ref.** EPR/TP3639BH
**Source:** https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32012D0135

| BAT-C Statements | Description and Assessment | BAT Assessment |
|---|---|---|
| — implementation of a greening of the site by covering unused areas with top soil and planting grass, shrubs and other ground covering vegetation | | N/A |
| — the moistening of the surface using durable dust-binding substances | | N/A |
| — the covering of the surface with tarpaulins or coating (e.g. latex) stockpiles | | N/A |
| — the application of storage with retaining walls to reduce the exposed surface | | N/A |
| — when necessary, a measure could be to include impermeable surfaces with concrete and drainage. | | Meets BAT |
| IV. Where fuel and raw materials are delivered by sea and dust releases could be significant, some techniques include: | | |
| — use by operators of self-discharge vessels or enclosed continuous unloaders. Otherwise, dust generated by grab- type ship unloaders should be minimised through a combination of ensuring adequate moisture content of the material is delivered, by minimising drop heights and by using water sprays or fine water fogs at the mouth of the ship unloader hopper | | N/A |
| — avoiding seawater in spraying ores or fluxes as this results in a fouling of sinter plant electrostatic precipitators with sodium chloride. Additional chlorine input in the raw materials may also lead to rising emissions (e.g. of polychlorinated dibenzodioxins/furans (PCDD/F)) and hamper filter dust recirculation | | N/A |
| — storage of powdered carbon, lime and calcium carbide in sealed silos and conveying them pneumatically or storing and transferring them in sealed bags. | | N/A |
| V. Train or truck unloading techniques include: | | |
| — if necessary due to dust emission formation, use of dedicated unloading equipment with a generally enclosed design. | | N/A |
| VI. For highly drift-sensitive materials which may lead to significant dust release, some techniques include: | | |
| — use of transfer points, vibrating screens, crushers, hoppers and the like, which may be totally enclosed and extracted to a bag filter plant | | Meets BAT |
| — use of central or local vacuum cleaning systems rather than washing down for the removal of spillage, since the effects are restricted to one medium and the recycling of spilt material is simplified. | | N/A |
| VII. Techniques for the handling and processing of slag include: | | |
| — keeping stockpiles of slag granulate damp for slag handling and processing since dried blast furnace slag and steel slag can give rise to dust | | N/A |
| — use of enclosed slag-crushing equipment fitted with efficient extraction and bag filters to reduce dust | | N/A |
| VIII. Techniques for handling scrap include: | | |
| — providing scrap storage under cover and/or on concrete floors to minimise dust lift-off caused by vehicle movements | | N/A |
| IX. Techniques to consider during material transport include: | | |
| — the minimisation of points of access from public highways | | N/A |
| — the employment of wheel-cleaning equipment to prevent the carryover of mud and dust onto public roads | | N/A |
| — the application of hard surfaces to the transport roads (concrete or asphalt) to minimise the generation of dust clouds during materials transport and the cleaning of roads | | Meets BAT |
| — the restriction of vehicles to designated routes by fences, ditches or banks of recycled slag | | N/A |
| — the damping of dusty routes by water sprays, e.g. at slag-handling operations | | N/A |
| — ensuring that transport vehicles are not overfull, so as to prevent any spillage | | Meets BAT |
| — ensuring that transport vehicles are sheeted to cover the material carried | | Non-compliance |
| — the minimisation of numbers of transfers | | Meets BAT |
| — use of closed or enclosed conveyors | | N/A |
| — use of tubular conveyors, where possible, to minimise material losses by changes of direction across sites usually provided by the discharge of materials from one belt onto another | | N/A |
| — good practice techniques for molten metal transfer and ladle handling | | N/A |
| — dedusting of conveyor transfer points. | | N/A |
| 1.1.6. Water and waste water management<br>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. In this context, the following techniques can be used where the prerequisites mentioned are present:<br>— avoiding the use of potable water for production lines<br>— increasing the number and/or capacity of water circulating systems when building new plants or modernising/re- vamping existing plants<br>— centralising the distribution of incoming fresh water<br>— using the water in cascades until single parameters reach their legal or technical limits<br>— using the water in other plants if only single parameters of the water are affected and further usage is possible<br>— keeping treated and untreated waste water separated; by this measure it is possible to dispose of waste water in different ways at a reasonable cost<br>— using rainwater whenever possible.<br>**Applicability**<br>The water management in an integrated steelworks will primarily be constrained by the availability and quality of fresh water and local legal requirements. In existing plants the existing configuration of the water circuits may limit applica- bility. | No water is used within the DOB & QT process. | N/A |
| 1.1.7. Monitoring<br>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. | No new emission points are proposed. Monitoring programmes are already in place. | Meets BAT |
| 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.<br>BAT is to use continuous measurements at least for:<br>— primary emissions of dust, nitrogen oxides ($NO_x$) and sulphur dioxide ($SO_2$) from sinter strands<br>— nitrogen oxides ($NO_x$) and sulphur dioxide ($SO_2$) emissions from induration strands of pelletisation plants<br>— dust emissions from blast furnace cast houses<br>— secondary emissions of dust from basic oxygen furnaces<br>— emissions of nitrogen oxides ($NO_x$) from power plants<br>— dust emissions from large electric arc furnaces.<br>For other emissions, BAT is to consider using continuous emission monitoring depending on the mass flow and emission characteristics. | The extract from the DAA is to be connected to emission point A1. This point is already permitted and monitored. | Meets BAT |
| 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<br>**Description (relevant for BAT 14 and 15)**<br>The monitoring of process gases provides information about the composition of process gases and about indirect emissions from the combustion of process gases, such as emissions of dust, heavy metals and $SO_x$.<br>Stack emissions can be measured by regular, periodic discontinuous measurements at relevant channelled emission sources over a sufficiently long period, to obtain representative emission values.<br>For monitoring the discharge of waste water a great variety of standardised procedures exist for sampling and analyzing water and waste water, including:<br>— a random sample which refers to a single sample taken from a waste water flow<br>— a composite sample, which refers to a sample taken continuously over a given period, or a sample consisting of several samples taken either continuously or discontinuously over a given period and blended<br>— a qualified random sample shall refer to a composite sample of at least five random samples taken over a maximum period of two hours at intervals of no less than two minutes, and blended.<br>Monitoring should be done according to the relevant EN or ISO standards. If EN or ISO standards are not available, national or other international standards should be used that ensure the provision of data of an equivalent scientific quality. | Not applicable to the DAA. | 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.<br>— Direct measurement methods where the emissions are measured at the source itself. In this case, concentrations and mass streams can be measured or determined.<br>— Indirect measurement methods where the emission determination takes place at a certain distance from the source; a direct measurement of concentrations and mass stream is not possible.<br>— Calculation with emission factors.<br>**Description**<br>*Direct or quasi-direct measurement*<br>Examples for direct measurements are measurements in wind tunnels, with hoods or other methods like quasi-emissions measurements on the roof of an industrial installation. For the latter case, the wind velocity and the area of the roofline vent are measured and a flow rate is calculated. The cross-section of the measurement plane of the roofline vent is subdivided into sectors of identical surface area (grid measurement).<br>*Indirect measurements*<br>Examples of indirect measurements include the use of tracer gases, reverse dispersion modelling (RDM) methods and the mass balance method applying light detection and ranging (LIDAR).<br>*Calculation of emissions with emission factors*<br>Guidelines using emission factors for the estimation of diffuse dust emissions from storage and handling of bulk materials and for the suspension of dust from roadways due to traffic movements are:<br>— VDI 3790 Part 3<br>— US EPA AP 42 | Fugitive dust monitoring is already undertaken as part of regular environmental monitoring.<br><br>No changes are proposed. | Meets BAT |

**BAT Assessment** - Industrial emissions for iron and steel production

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| BAT-C Statements | Description and Assessment | BAT Assessment |
|---|---|---|
| 1.1.8. Decommissioning<br>17. BAT is to prevent pollution upon decommissioning by using necessary techniques as listed below.<br>Design considerations for end-of-life plant decommissioning:<br>I. giving consideration to the environmental impact from the eventual decommissioning of the installation at the stage of designing a new plant, as forethought makes decommissioning easier, cleaner and cheaper<br>II. decommissioning poses environmental risks for the contamination of land (and groundwater) and generates large quantities of solid waste; preventive techniques are process-specific but general considerations may include:<br>(i) avoiding underground structures<br>(ii) incorporating features that facilitate dismantling<br>(iii) choosing surface finishes that are easily decontaminated<br>(iv) using an equipment configuration that minimises trapped chemicals and facilitates drain-down or cleaning<br>(v) designing flexible, self-contained units that enable phased closure<br>(vi) using biodegradable and recyclable materials where possible. | The DOB & QT decommissioning process (when required) will employ existing documented processes.<br>No changes are proposed. | Meets BAT |
| 1.1.9. Noise<br>18. BAT is to reduce noise emissions from relevant sources in the iron and steel manufacturing processes by using one or more of the following techniques depending on and according to local conditions:<br>— implementation of a noise-reduction strategy<br>— enclosure of the noisy operations/units<br>— vibration insulation of operations/units<br>— internal and external lining made of impact-absorbent material<br>— soundproofing buildings to shelter any noisy operations involving material transformation equipment<br>— building noise protection walls, e.g. the construction of buildings or natural barriers, such as growing trees and bushes between the protected area and the noisy activity<br>— outlet silencers on exhaust stacks<br>— lagging ducts and final blowers which are situated in soundproof buildings<br>— closing doors and windows of covered areas. | The DOB & QT processing will occur within a new fully refurbished and enclosed building located between two large existing structures (i.e. de-dust plant and electrical building). The plant is relatively minor in size and scale and is effectively screened by the surrounding buildings. No new external plant is to be installed as part of the Project. All existing equipment (e.g. silos, bag-filling equipment and air-handling extraction systems) are part of the current noise baseline. Therefore, given the size, scale and location of the proposed activity, a revised noise impact assessment has not been undertaken. | Meets BAT |
| 1.2. *BAT Conclusions For Sinter Plants*<br>Unless otherwise stated, the BAT conclusions presented in this section can be applied to all sinter plants. | | N/A |
| 1.3. *BAT Conclusions For Pelletisation Plants*<br>Unless otherwise stated, the BAT conclusions presented in this section can be applied to all pelletisation plants. | | N/A |
| 1.4. *BAT Conclusions For Coke Oven Plants*<br>Unless otherwise stated, the BAT conclusions presented in this section can be applied to all coke oven plants. | | N/A |
| 1.5. *BAT Conclusions For Blast Furnaces*<br>Unless otherwise stated, the BAT conclusions presented in this section can be applied to all blast furnaces. | | N/A |
| 1.6. *BAT Conclusions For Basic Oxygen Steelmaking And Casting*<br>Unless otherwise stated, the BAT conclusions presented in this section can be applied to all basic oxygen steelmaking and casting. | | N/A |
| 1.7. *BAT Conclusions For Electric Arc Furnace Steelmaking And Casting*<br>Unless otherwise stated, the BAT conclusions presented in this section can be applied to all electric arc furnace steelmaking and casting. | | N/A |
| ***Air emissions***<br>87. BAT for the electric arc furnace (EAF) process is to prevent mercury emissions by avoiding, as much as possible, raw materials and auxiliaries which contain mercury (see BAT 6 and 7). | Not applicable to the DAA. | N/A |
| 88. BAT for the electric arc furnace (EAF) primary and secondary dedusting (including scrap preheating, charging, melting, tapping, ladle furnace and secondary metallurgy) is to achieve an efficient extraction of all emission sources by using one of the techniques listed below and to use subsequent dedusting by means of a bag filter:<br>I. a combination of direct off-gas extraction (4th or 2nd hole) and hood systems<br>II. direct gas extraction and doghouse systems<br>III. direct gas extraction and total building evacuation (low-capacity electric arc furnaces (EAF) may not require direct gas extraction to achieve the same extraction efficiency).<br>The overall average collection efficiency associated with BAT is > 98 %.<br>The BAT-associated emission level for dust is < 5 mg/Nm³, determined as a daily mean value.<br>The BAT-associated emission level for mercury is < 0,05 mg/Nm³, determined as the average over the sampling period (discontinuous measurement, spot samples for at least four hours). | Not applicable to the DAA. | N/A |
| 89. BAT for the electric arc furnace (EAF) primary and secondary dedusting (including scrap preheating, charging, melting, tapping, ladle furnace and secondary metallurgy) is to prevent and reduce polychlorinated dibenzodioxins/furans (PCDD/F) and polychlorinated biphenyls (PCB) emissions by avoiding, as much as possible, raw materials which contain PCDD/F and PCB or their precursors (see BAT 6 and 7) and using one or a combination of the following techniques, in conjunction with an<br>I. appropriate post-combustion<br>II. appropriate rapid quenching<br>III. injection of adequate adsorption agents into the duct before dedusting.<br>The BAT-associated emission level for polychlorinated dibenzodioxins/furans (PCDD/F) is < 0,1 ng I-TEQ/Nm³, based on a 6 – 8 hour random sample during steady-state conditions. In some cases, the BAT-associated emission level can be achieved with<br>**Applicability of BAT I**<br>In existing plants, circumstances like available space, given off-gas duct system, etc. need to be taken into consideration for assessing the applicability. | Not applicable to the DAA. | N/A |
| 90. BAT for on-site slag processing is to reduce dust emissions by using one or a combination of the following techniques:<br>I. efficient extraction of the slag crusher and screening devices with subsequent off-gas cleaning, if relevant<br>II. transport of untreated slag by shovel loaders<br>III. extraction or wetting of conveyor transfer points for broken material<br>IV. wetting of slag storage heaps<br>V. use of water fogs when broken slag is loaded.<br>In the case of using BAT I, the BAT-associated emission level for dust is < 10 – 20 mg/Nm³, determined as the average over the sampling period (discontinuous measurement, spot samples for at least half an hour). | Not applicable to the DAA. | N/A |
| ***Water and waste water***<br>91. BAT is to minimise the water consumption from the electric arc furnace (EAF) process by the use of closed loop water cooling systems for the cooling of furnace devices as much as possible unless once-through cooling systems are used. | Not applicable to the DAA. | N/A |
| 92. BAT is to minimise the waste water discharge from continuous casting by using the following techniques in combination:<br>I. the removal of solids by flocculation, sedimentation and/or filtration<br>II. the removal of oil in skimming tanks or in any other effective device<br>III. the recirculation of cooling water and water from vacuum generation as much as possible.<br>The BAT-associated emission levels, for waste water from continuous casting machines, based on a qualified random sample or a 24-hour composite sample, are:<br>— suspended solids < 20 mg/l<br>— iron < 5 mg/l<br>— zinc < 2 mg/l<br>— nickel < 0,5 mg/l<br>— total chromium < 0,5 mg/l<br>— total hydrocarbons < 5 mg/l | Not applicable to the DAA. | N/A |
| ***Production residues***<br>93. BAT is to prevent waste generation by using one or a combination of the following techniques:<br>I. appropriate collection and storage to facilitate a specific treatment<br>II. recovery and on-site recycling of refractory materials from the different processes and use internally, i.e. for the substitution of dolomite, magnesite and lime<br>III. use of filter dusts for the external recovery of non-ferrous metals such as zinc in the non-ferrous metals industry, if necessary, after the enrichment of filter dusts by recirculation to the electric arc furnace (EAF)<br>IV. separation of scale from continuous casting in the water treatment process and recovery with subsequent recycling, e.g. in the sinter/blast furnace or cement industry<br>V. external use of refractory materials and slag from the electric arc furnace (EAF) process as a secondary raw material where market conditions allow for it.<br>BAT is to manage in a controlled manner EAF process residues which can neither be avoided nor recycled.<br>**Applicability**<br>The external use or recycling of production residues as mentioned under BAT III – V depend on the cooperation and agreement of a third party which may not be within the control of the operator, and therefore may not be within the | The primary purpose of this Project is to improve the physical characteristics of the DOB & QT materials to enable integration within the other existing (economically viable) process streams thereby allowing increased recovery. | Meets BAT |
| ***Energy***<br>94. BAT is to reduce energy consumption by using continuous near net shape strip casting, if the quality and the product mix of the produced steel grades justify it.<br>**Description**<br>Near net shape strip casting means the continuous casting of steel to strips with thicknesses of less than 15 mm. The casting process is combined with the direct hot rolling, cooling and coiling of the strips without an intermediate reheating furnace used for conventional casting techniques, e.g. continuous casting of slabs or thin slabs. Therefore, strip casting represents a technique for producing flat steel strips of different widths and thicknesses of less than 2 mm. | Not applicable to the DAA. | N/A |

| BAT-C Statements | Description and Assessment | BAT Assessment |
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| **Applicability**<br>The applicability depends on the produced steel grades (e.g. heavy plates cannot be produced with this process) and on the product portfolio (product mix) of the individual steel plant. In existing plants, the applicability may be constrained by the layout and the available space as e.g. retrofitting with a strip caster requires approximately 100 m in length. | | |
| ***Noise***<br>95. BAT is to reduce noise emissions from electric arc furnace (EAF) installations and processes generating high sound energies by using a combination of the following constructional and operational techniques depending on and according to local conditions (in addition to using the techniques listed in BAT 18):<br>I. construct the electric arc furnace (EAF) building in such a way as to absorb noise from mechanical shocks resulting from the operation of the furnace<br>II. construct and install cranes destined to transport the charging baskets to prevent mechanical shocks<br>III. special use of acoustical insulation of the inside walls and roofs to prevent the airborne noise of the electric arc furnace (EAF) building<br>IV. separation of the furnace and the outside wall to reduce the structure-borne noise from the electric arc furnace (EAF) building<br>V. housing of processes generating high sound energies (i.e. electric arc furnace (EAF) and decarburisation units) within the main building. | Not applicable to the DAA. | N/A |