Report 3 Summary Environmental Management System

SSQ MATERIALS RECYCLING FACILITY LLANWERN

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Version	Issue	Notes
V1	December 2024	Permit application
V2	June 2025	Updated to consolidate Schedule 5 responses

1 INTRODUCTION

An Environmental Management System (EMS) is a structured system which, once implemented, helps an organisation to identify the environmental impacts resulting from its business activities. It also helps manage and reduce those impacts, so that the environmental performance of the organisation is improved. An EMS should provide a methodical approach to planning, implementing and reviewing an organisation's environmental management.

Under the Environmental Permitting Regulations, DLS is required to have an appropriate EMS in place while it is holding a Permit. The EMS must set out in detail, how all the activities relating to the Permit, and specifically waste management and pollution control will be managed.

At this stage of the application process, NRW requires a summary of the management system to be in place when the site is operational. By the time the Permit is issued, NRW will expect DLS to have the management systems in place as it will be part of the first NRW site inspection.

Central to the EMS will be a set of Procedures and Standard Forms which will need to be implemented when the site is operational. In this summary EMS, the range of procedures that will be required are detailed and the type of forms that will be implemented provided. As DLS will process waste to produce aggregates in accordance with Quality Protocols, a Factory Production Control system will also be in place when the site is operational.

1.1 Objectives

DLS already successfully operates an integrated management system produced to achieve the benefits from management system standards ISO 9001:2008 and ISO 14001:2004.

The EMS that will ultimately be in place will be aligned with these standards. This site specific EMS does not attempt to duplicate the procedures already documented in the integrated company EMS and which will also ultimately apply at the site. Rather, this summary EMS outlines the measures that will be adopted to ensure that the management of the waste is being controlled and risks to the environment managed.

2 THE SITE SETTING

2.1 History

The different areas forming part of the wider land ownership of Tata to the south of Queensway are identified on Figure 2-1.

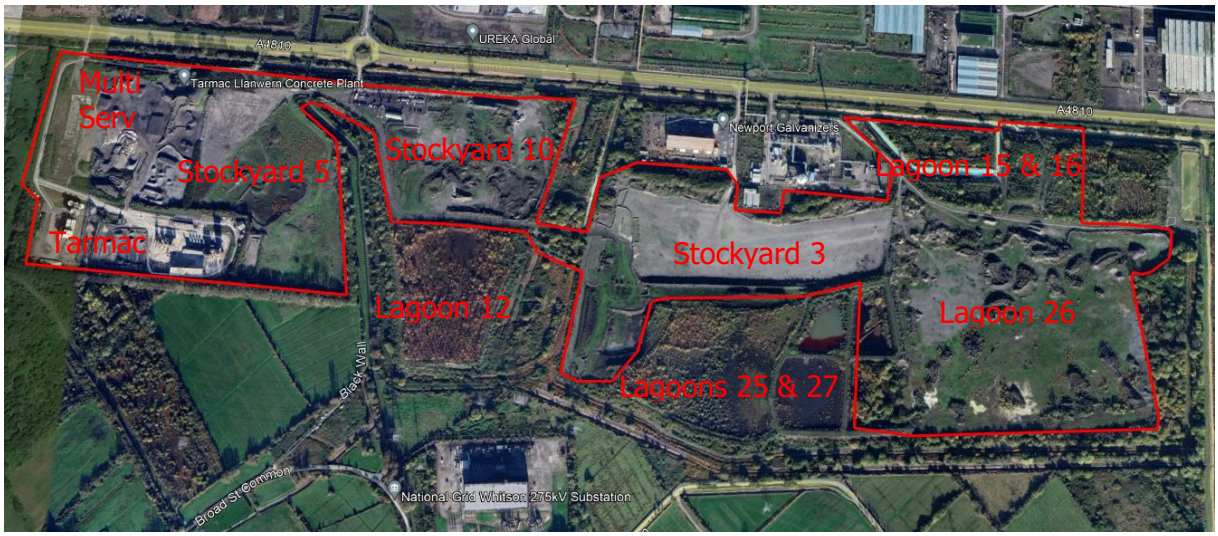


Figure 2-1 Annotated Site Plan

Prior to placement of a slag aggregate hardstanding, the ground surface comprised poorly drained pasture land dissected by a number of shallow ditches which were part of the reen system of the Gwent levels. Utilisation of the area was initially confined to the western part and the gases manufacturing plant (the current Wedge Group Galvanising Plant). However, the utilisation expanded over the years and saw the construction of a bunded landfill for ferruginous sludges created in 1979 at Lagoon 12 and then expansion on the east.

The area to the south of Queensway was historically the waste processing and waste disposal area for the works. In addition, the site provided a safe and level area for some of the essential ancillary services which supported the steelworks operations. These included the gases manufacturing plant (formerly BOC but now Air Products), the heavy vehicle maintenance garage, a concrete and asphalt plant (which used slag aggregates in the manufacturing) and a cement and concrete plant (also used slag in the manufacturing process). In 2004, part of the BOC works was converted to become a commercial galvanising plant which also provides services to the works.

2.2 Current Topography

The current topography of each area is characterised by wide open spaces of level ground that is covered with numerous stockpile of various size and orientation.

2.3 Ground Conditions

The ground conditions across the whole of SSQ and the three processing areas is consistent and very well understood. In summary, the following sequence of strata is consistently present:

Strata	Thickness(m)
Infilled Ground – Slag	0.30 – 3.00
Estuarine Alluvium – Upper Marine Clay	3.10 – 7.00
Estuarine Alluvium – Peat	1.00 – 2.00
Estuarine Alluvium – Lower Marine Clay	1.00 – 4.10
Triassic Bedrock	>5.20

A Holocene sequence of low permeability clays and peat overlie bedrock at the site. This sequence of clays and peats are typically 10 to 15 meters thick across the Gwent levels and were formed within the last 10,000 years or so. At the site, these sediments have been found to be locally up to 17 meters thick and to comprise an upper and lower clay layer separated by a peat horizon.

2.4 Current Land Quality

The land quality in each area has been investigated. The full results of these investigations are presented in the Site Condition Report that will be maintained during the lifetime of the Permit and used to inform Surrender. Analysis of site materials has shown that it is suitable for a commercial land use.

2.5 Hydrogeology

The strata below and near the site is considered by NRW as a non-aquifer. Both the Holocene sediments and the underlying Mercia Mudstone are of low to extremely low permeability, which supports their classification of the area as a Non-Aquifer. There is no known licensed or unlicensed groundwater abstraction from strata underlying the Caldicot Levels.

The absence of any groundwater abstractions from this hydrogeological setting, in an area where mains supply requires significant investment in infrastructure, supports the assertion that groundwater is not a viable resource in this low permeability setting. The site is located in an area of low groundwater vulnerability.

2.6 Hydrology

There are no surface water features in any of the areas to be Permitted.

There are two primary watercourses present in the area, the Hundred Perches Reen and Monks' Ditch. Both are classified as Main Rivers, which means that they fall under the responsibility of Natural Resources Wales (NRW). Smaller watercourses include Oxleaze Reen that is located directly north of the South Wales main railway line.

The Hundred Perches Reen flows from north to south along the far eastern boundary of the steelworks and into Middle Road Reen which discharges to the estuary by way of Elver Pill Reen and Windmill Reen. This reen is over 1km east of the site. The Monks' Ditch flows from north to south approximately 350m west of the Westland site, along the eastern edge of Stockyard 5. Both watercourses ultimately discharge into the Severn Estuary, which lies approximately 4km to the south.

The network of ditches and reens immediately surrounding the site are shown on Figure 2-2. These form part of the Gwent Levels which comprises an extensive low-lying area of estuarine alluvium located on the north side of the Severn Estuary between Cardiff and the River Rhymney in the west and Chepstow on the River Wye in the east. The presence of these ditches reflects the very low permeability of the upper clay.

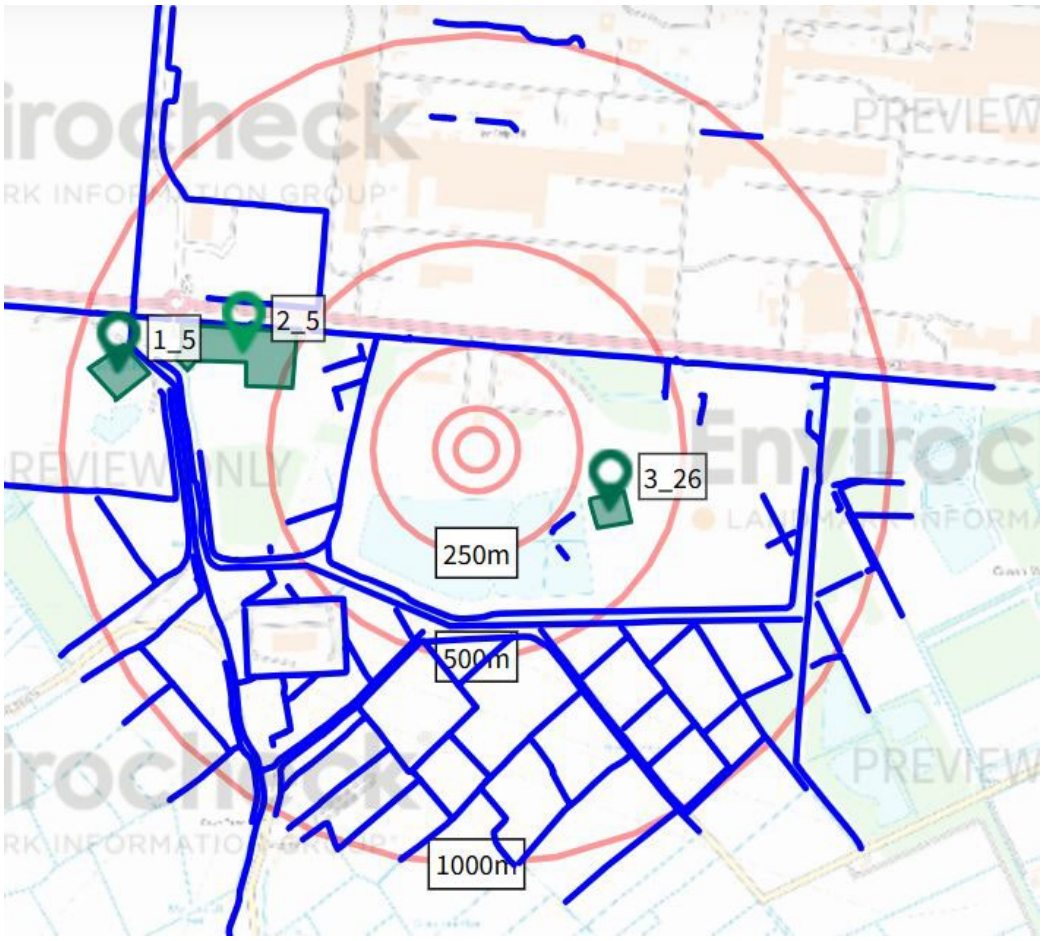


Figure 2-2 Surface water features around each site

Almost all the annual recharge falling on the SSQ site and surrounding Gwent Levels leaves via surface runoff due to the low permeability nature of upper clay soils and the underlying low permeability Holocene sediments.

On site, infiltration falling on the hardstanding to be used for storage and processing in each of the areas will ultimately be captured into the same network of ditches but will first infiltrate through the slag development platform and slowly migrate along the upper surface of the upper clay. Such seepage will eventually migrate to one of the surface water ditches excavated into the low permeability upper clay that encompass SSQ. These ditches are designed to capture and divert such drainage to the Tata surface water treatment area, preventing escape to the wider environment.

As all of the drainage ditches surrounding SSQ are incised into the underlying low permeability alluvial clays they provide a protective barrier against the migration of potential contaminants from SSQ to the sensitive Site of Special Scientific Interest (SSSI) features to the South. The whole system is managed under Tata's environmental permit with routine maintenance including dredging and vegetation clearance as shown in Plate 2-1.

Plate 2-1 Ongoing clearance of inner ditch south of Lagoon 25 (12 November 2024)

2.7 Flood Potential

According to the mapping provided in the Envirocheck report parts of the site appear to be at risk of flooding.

2.8 Pollution Incidents

According to the Envirocheck report there are no recorded pollution incidents to surface water at the site or in the surrounding area.

2.9 Ground Instability

The placement of the slag aggregate hardstanding has allowed the site to be used for commercial purposes for several decades and no natural ground is currently present at ground surface within the site.

2.10 Environmental Sensitivity

The SSQ and the three sites lie adjacent to the Whitson Site of Special Scientific Interest (SSSI) and Nash And Goldcliff SSSI, notified in 1988 and 1987 respectively. These two SSSI's form part of a series between Chepstow and Cardiff, the whole area being referred to as the Gwent Levels. These two SSSI's were designated because they form part of an extensive reen system now rare within Wales which supports a rich assemblage of plants and animals. This is principally due to the variety of reen types and differing management regimes. The position of the SSSI relative to the three area is shown in Figure 2-3.

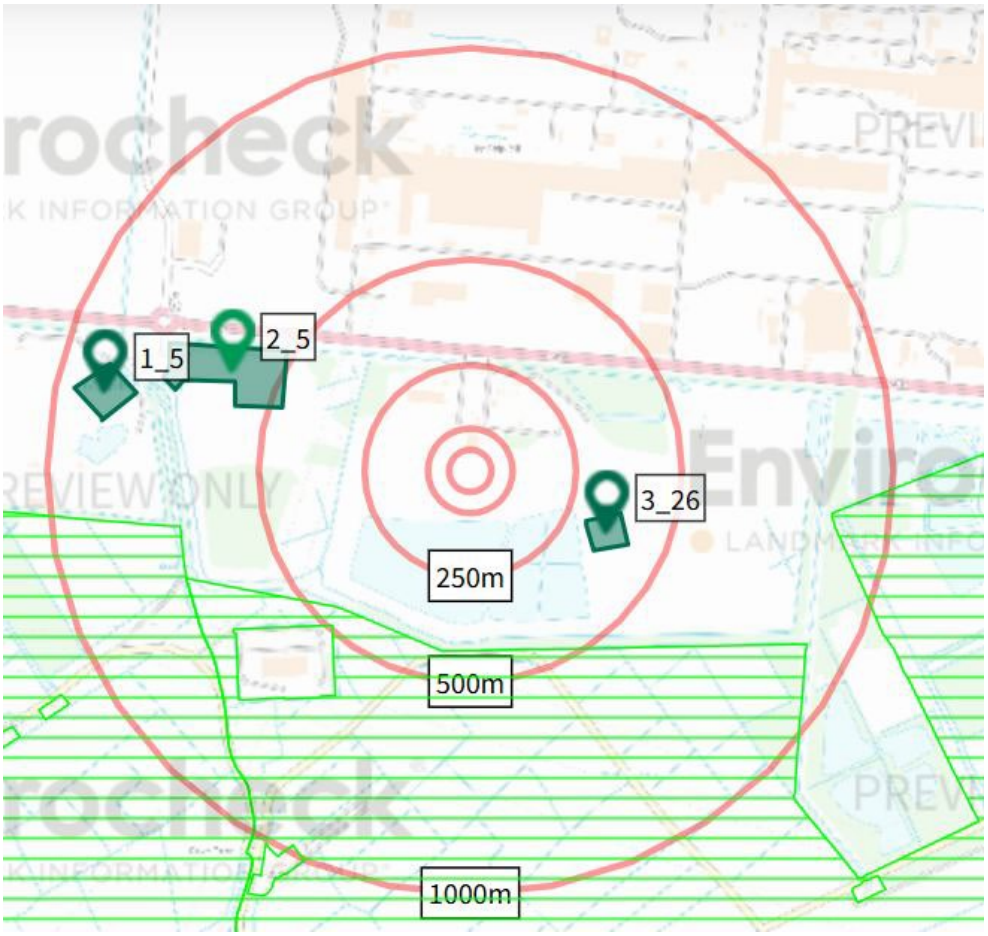


Figure 2-3 Position of SSSI (horizontal green line) relative to processing areas

The importance of these SSSI is enhanced by their proximity to the Severn Estuary which is also a protected area.

According to the Envirocheck report there are no other designated sites in proximity to the site. However, a Site of Importance for Nature Conservation (SINC), known as Spencer Works 3, was previously identified in the southeastern corner of SSQ. At this stage, it appears that this site is no longer designated as a SINC as it is not listed on the Newport Council website. As this area is no longer marshy grassland this may have resulted in its removal from the list of SINCs. Such SINC designations do not prevent developments, where there are no adverse impacts on the features for which a site is designated and on wider ecosystem

resilience. Where harm is unavoidable it should be minimised by mitigation measures and offset as far as possible by compensation measures.

2.10.1 Ancient Woodland

There is no ancient woodland in close proximity to the site.

2.11 Residential Properties

As shown on Figure 2-4, the SSQ area is remote and not directly connected to any residential areas. The closest properties are located approximately 700m southwest.

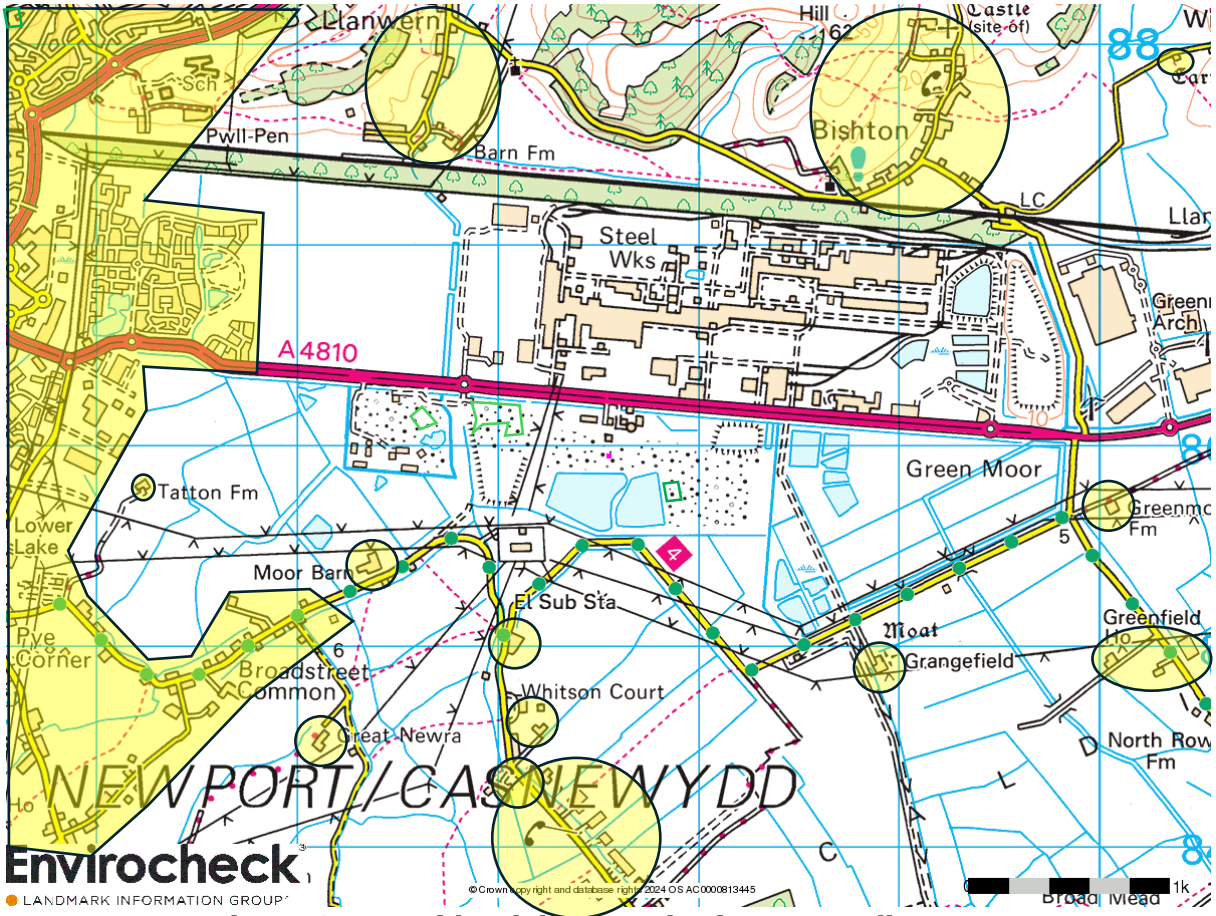


Figure 2-4 Residential properties in surrounding area

2.12 Waste Management

In the 1970's, Newport Borough Council issued a COPA licence for the disposal of waste materials from the steelworks within SSQ. The licence was never surrendered or rescinded and the licence transferred into the Waste Management regime (Licence 024/97). Various parts of the SSQ Waste Management site were subsequently taken into the IPPC permit for the steelworks, but this permit ceased with the cessation of steelmaking in 2002. Subsequently, Lagoon 27 was taken into the steelworks PPC Permit at the time (Permit BS3905). A Non-Hazardous landfill has also been permitted under the PPC regime within SSQ (PPC Permit GP 3331SV). This PPC landfill is referred to as South Side Queensway Non-Hazardous Landfill (SSQNHL). This landfill has never entered its pre-operational phase.

Natural Resources Wales issued a Closure Notice (No. GR/EM4/01) for Llanwern Landfill, South Side Queensway (SSQ) which specified that the landfill must cease accepting waste for disposal as of 25 February 2008 and that it must be maintained, monitored and controlled as required by the conditions of the authorisation numbered 024/79. In response, Tata prepared a Closure Report and Aftercare Monitoring Plan that was accepted by NRW.

This means that none of the proposed treatment areas are covered by an operational Permit.

2.13 Other Regulated Activities

Alongside the regulation and permitting of landfills, there are many industrial activities in the area. These are related to the immediate activities to the north of SSQ and in the main steelworks. This includes the COMAH facilities at Air Products on the northern boundary of SSQ.

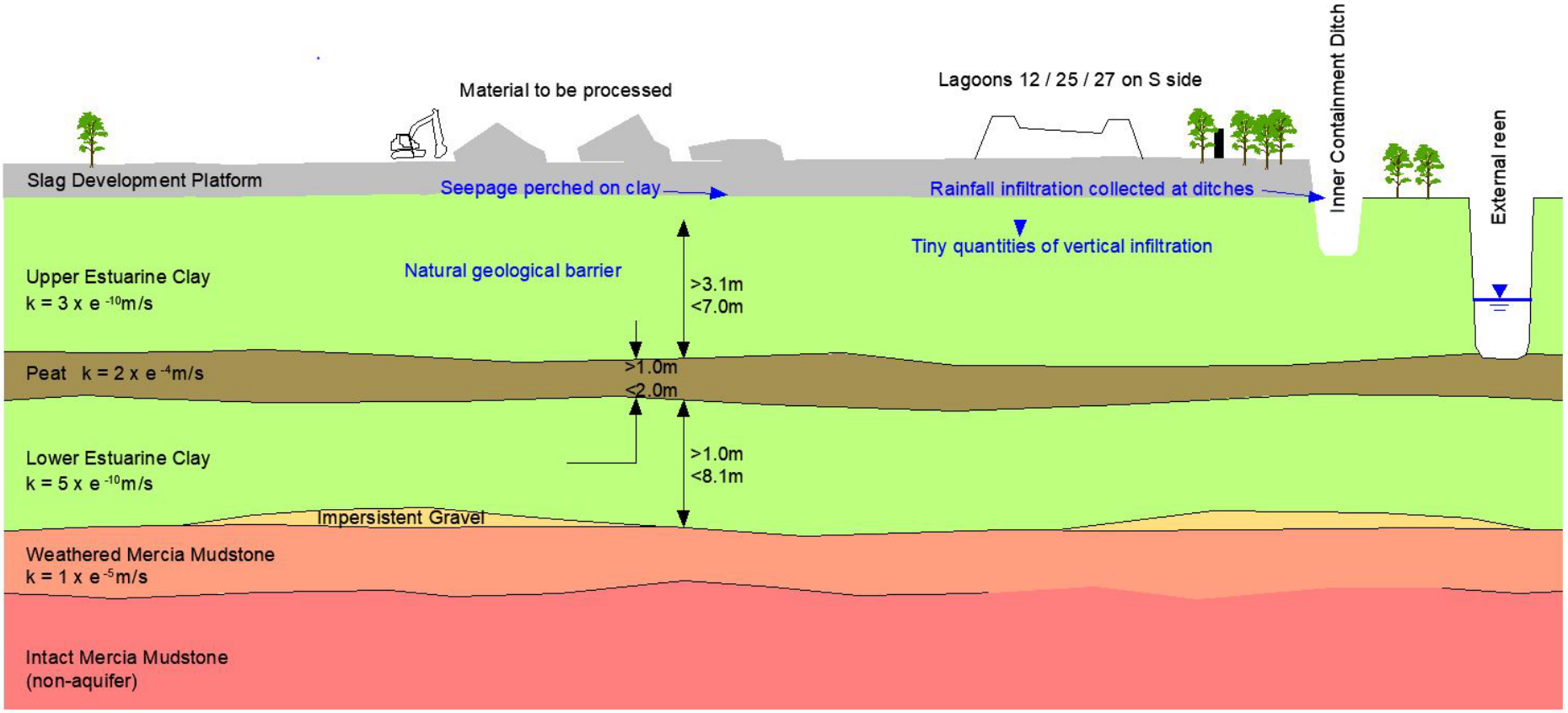
2.14 Potential off-site Contaminative Sources

To the immediate north of the site are several commercial and industrial operations. Beyond the A4810 are the remains of Llanwern steelworks that started operating in the 1960's. With the demise of the 'heavy end' in 2001, the site currently includes mills that roll, pickle and galvanise steel coil for a range of engineering applications. This operation is undertaken under a Permit regulated by Natural Resources Wales.

2.15 Conceptual Site Model

The current conceptual site model underpinning the risk assessment and therefore the management systems is diagrammatically illustrated in Figure 2-5.

Figure 2-5 Current Conceptual Site Model



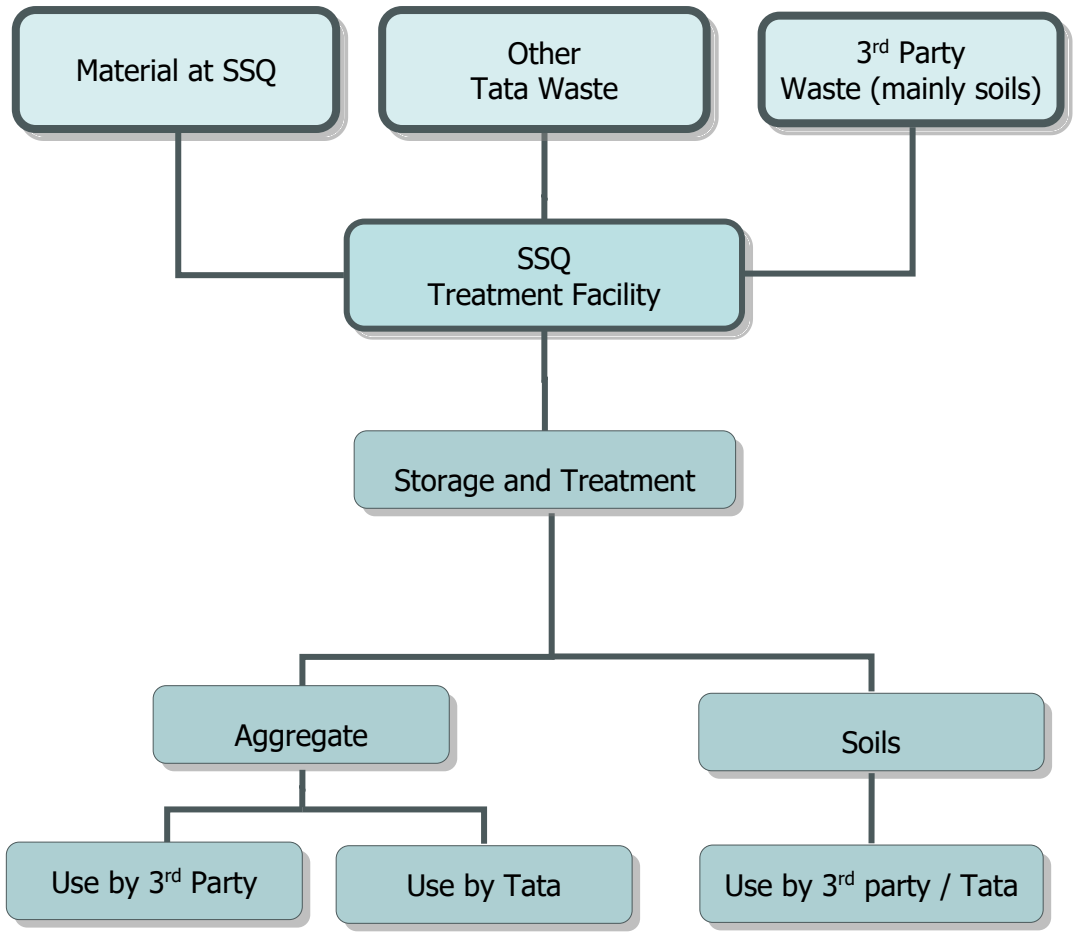
3 OVERVIEW OF WASTE OPERATIONS

3.1 Overview

DLS requires a Permit to allow the storage and processing of waste at three positions on the South Side of Queensway (SSQ), Llanwern. The recovered outputs from the facility will primarily include slag and construction based aggregate and soil.

A flowchart showing the overall process is provided in Flowchart 3-1.

Flowchart 3-1 Proposed Operation at SSQ



3.2 Acceptable Wastes

Table 3-1 summarises the list of wastes to be stored and processed.

Table 3-1 Wastes to be Accepted

EWC Code	Description of Wastes to be Accepted	EWC Entry Type
EXCLUSIONS Wastes having any of the following characteristics shall not be accepted: • Consisting solely or mainly of dusts, powders or loose fibres • Hazardous wastes • Wastes in liquid form		
01 04 08	Waste gravel and crushed rocks other than those mentioned in 01 04 07 may include excavation from mineral workings	MN
01 04 09	Waste sand only	AN
10 11 03	Waste glass-based fibrous materials allowed only if: Wastes without organic binders	AN
15 01 07	Glass packaging	AN
17 01 01	Concrete (excluding concrete slurry)	MN
17 01 02	Bricks	MN
17 01 03	Tiles and ceramics	MN
17 01 07	Mixtures of concrete, bricks, tiles and ceramics other than those mentioned in 17 01 06	MN
17 02 02	Glass (Must not include fibreglass or glass fibre)	MN
17 03 02	Bituminous mixtures	MN
17 05 04	Soil and stones other than those mentioned in 17 05 03 Must not contain any contaminated soil or stone from contaminated sites.	MN
17 05 06	Dredging spoil other than those mentioned in 17 05 05 allowed only if: Inert aggregate from dredgings. Must not contain contaminated dredgings. Must not contain fines.	MN
17 05 08	Track ballast other than those mentioned in 17 05 07	MN
17 09 04	Mixed construction and demolition waste comprising granular material	MN
19 12 05	Glass Does not include glass from cathode ray tubes.	AN
19 12 09	Minerals (for example sand, stones)	AN
20 01 02	Glass Must not include fibreglass.	AN
20 02 02	Garden and park wastes (including cemetery waste) – soil and stones Must not contain contaminated stones from garden and parks waste.	AN
16 11 04	Refractory	MN
10 02 01	Waste from the processing of blast furnace slag / steel slag	AN
10 02 02	Unprocessed blast furnace slag / steel slag	AN
10 02 99	Slab yard refuse	AN
10 12 08	waste ceramics, bricks, tiles and construction products (after thermal processing)	AN
10 13 14	Waste concrete only	

Wastes having any of the following characteristics shall not be accepted:

- Consisting solely or mainly of dusts, powders or loose fibres; and
- Wastes that are in a form which is either sludge or liquid.
- AN – Absolute Non-Hazardous
- MN – Mirror Non-Hazardous

3.3 Recovered Outputs

3.3.1 Production of Aggregate

Several of the wastes identified in Table 3-1 are listed as inert wastes in the WRAP Quality Protocol (WRAP QP) for the *Production of Aggregates from Inert Waste* (October 2013). Provided these wastes are not contaminated, this means that they can be used as feedstocks to produce aggregates. If the requirements of the WRAP QP are satisfied during their production, the aggregates will have ceased to be waste and no longer subject to waste controls.

More recently, the Environment Agency has published a series of Quality Protocols (QPs) which outline when a waste derived material can be regarded as a non-waste product and no longer subject to waste controls. One of these QPs is titled *Aggregate from waste steel slag (Steel QP).* If an operator can demonstrate that their production of aggregates meets the standard set out in the Steel QP, and the rules for all QPs, then the aggregates may be regarded as fully recovered and no longer subject to waste controls.

Many of the wastes listed are therefore recognised feedstocks for the production of aggregates. In addition to the requirements of a Waste Treatment Environmental Permit, their production will therefore also be subject to Factory Production Control.

3.3.2 Soil for Capping

At Llanwern, Tata has started capping East Waste Management Site (EWMS) landfill which is located on the Northern side of Queensway at the far eastern end of the works. To complete the capping, a further 100,000m^3 of soil is required to provide a durable and sustainable restoration surface above the capping systems. Similarly, at SSQ, Construction Quality Assurance (CQA) plans for the restoration and closure of Lagoons 25 and 27 respectively are being reviewed and updated (having previously been submitted to NRW) and these schemes require some 100,000 m^3 of capping soil. As a consequence, there is a high demand for large volumes of soil in the immediate vicinity.

As part of this bespoke Permit, candidate soils will be accepted, processed (if required), temporarily stored and then transferred to storage areas directly adjacent to the landfills to be capped. Processing will involve sorting and separating as candidate soil sources will be carefully vetted and only once they meet the soil chemistry required by each capping scheme will they be accepted.

3.4 Permitted Activities

In each area, the waste will be temporarily stored and processed according to the techniques summarised in Table 3-2. In the second column of Table 3-2 are the process limitations.

Table 3-2 Proposed Waste Processing Activities

Proposed Recovery and Disposal Codes applicable at the Site	Indicative Description of Proposed Activities
R13: Storage of wastes pending the operations numbered R3 and R5. **R3:** Recycling or reclamation of organic substances which are not used as solvents. **R4:** Recycling/reclamation of metals and metal compounds **R5:** Recycling or reclamation of other inorganic materials.	Treatment of listed wastes consisting only of sorting, separation, screening, crushing and blending of waste for recovery as a soil, soil substitute or aggregate. Washing of selected waste will occur in Area 2_10. Secure storage of listed wastes pending treatment. Storage of wastes shall not exceed 150,000 tonnes in total at any one time. No more than 300,000 tonnes of waste shall be treated per year. Where disposal is required, this will be undertaken in accordance with Duty of Care and legal requirements.

3.5 Factory Production Control

For operators to benefit from WRAP and Steel QPs operators must:

- use only the correct waste as feedstocks
- make only the permitted products
- comply with the relevant European standard, specification and quality controls for the product being manufactured with all required tests being met and the aggregate needing no further treatment, weathering or size reduction before use
- have a manual of Factory Production Control (FPC)
- have marked the product to the CE requirements of the Construction Products Regulations
- transport, store, handle and process the wastes and the final product following good practice guidelines
- supply the customer with delivery documents confirming the product meets the quality protocol

DLS will ensure that the aggregates produced are done so in accordance with a FPC that provides a record of all policies and methods for managing the waste material - from waste arriving through to storage, processing, transport, and delivery of quality protocol approved products. The FPC will essentially be a management system focussed on the production process which aims to ensure that product quality is consistently maintained to the required specifications. Evidence of its adoption and implementation will be achieved through scheduled controls and tests on measuring equipment, raw materials and constituents, processes, machines and manufacturing equipment and finished products, including material properties in products. Most importantly, the system will provide evidence for conformity assessment and for the management of non-conforming products.

4 SITE INFRASTRUCTURE

4.1 Access and Security

The operation at SSQ will benefit from the 24 hr manned security provided for the main steel works. During operating hours a further level of security is provided.

All deliveries will be scheduled under normal operating conditions and any deliveries from off-site will only be made by drivers who have been inducted to the site rules.

4.2 Site Accommodation

A single temporary office will be provided as welfare accommodation for the operatives involved with the operation.

4.3 Working Platform

The treatment areas benefit from a stable level hardstanding platform. The platform principally comprises granular slag.

4.4 Recovery Plant

The recovery process will utilise conventional mobile screens and crushers assisted by front loading shovels and tracked excavators. In areas 2_10 a log wash will be used to separate a fine fraction.

5 APPROACH TO EMS

5.1 Environmental Policy

DLS is committed to meeting the requirements of relevant legislation, the efficient use of natural resources & energy, and preventing pollution by continuously reducing the environmental impact of its operations & products through the adoption of sustainable practices.

In implementing the Policy the following key principles will be demonstrated:

Management Systems

Effective environmental and energy management systems will be implemented and maintained, and these will ensure the environmental awareness of the workforce, encouraging every employee to act in an environmentally responsible manner.

Continuous Improvement

The environmental impact of processes and products will be assessed and continuous improvement objectives and targets will be established. These will be achieved through process optimisation and through research, development and deployment of new technologies where opportunities present themselves.

Responsible Use of Resources

Efficient use will be made of energy, raw materials and water through adoption and sharing of good practice

Product Stewardship

Material reuse and recycling will be promoted and the environmental effects of products throughout their life-cycle will be communicated to customers.

Monitoring and Reporting

Environmental and energy performance will be monitored and audited and progress in meeting high-level Policy objectives and improvement targets will be reported publicly.

Responsible Procurement

Key suppliers and contractors will be encouraged to behave in an environmentally responsible manner and to abide by principles similar to those set out within this Policy.

5.2 Awareness of Legal and Other Requirements

DLS shall establish and maintain a procedure to identify and have access to current legal and other requirements that are applicable to the environmental aspects of its activities.

The environmental management representative will consider all legislative requirements that have been identified as being applicable to the sites environmental aspects, and will ensure that all relevant aspects of the business are aware of the legislative responsibilities and requirements. A log of all currently applicable legislation will be maintained.

5.3 Environmental Objectives & Targets

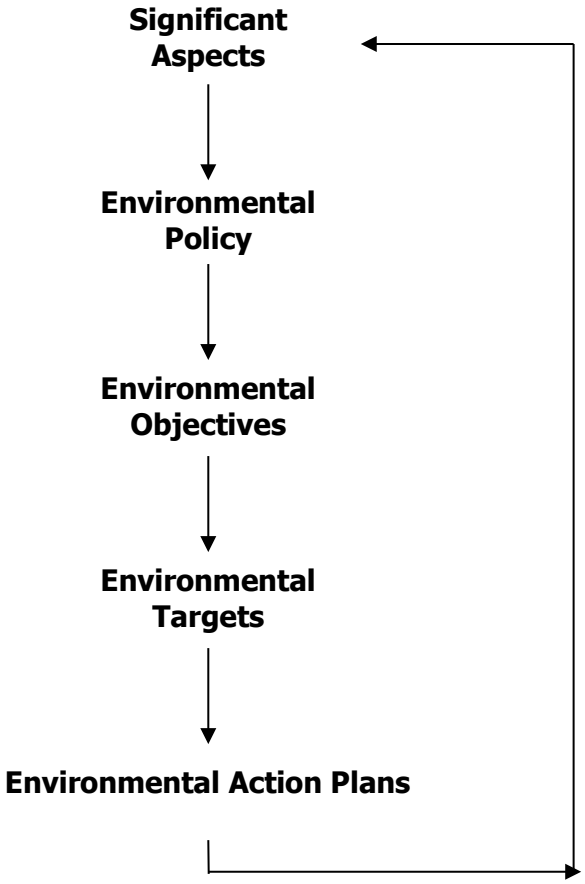
DLS is committed to continual environmental improvement. To achieve this goal, DLS will set key environmental objectives and targets that are directly linked to its environmental aspects and environmental policy and that are achievable, and where practicable, may be quantified. DLS shall establish and maintain documented environmental objectives and targets.

Objectives will be identified and defined as part of the ongoing evaluation of the sites environmental performance, legal requirements and Permit requirements. Implementation of the objectives and targets will be monitored by the environmental management representative, ideally on a monthly basis initially, to ensure acceptable progress and to help identify any additional resources or inputs that may be required.

DLS recognises that the main way in which environmental improvements will be achieved and implemented is if their progress is planned and sufficient and timely resources are committed. Every environmental objective will have a documented programme behind it.

Each action plan will be assigned to designated personnel and clearly documented. The overall process to identify action plans is summarised overleaf.

Flowchart 5-1 Links between Significant Aspects and Action Plans



Action plans may be documented in different ways depending upon the type of objective, the range of personnel involved and its complexity. The environmental management representative will track the performance of the implementation of the objectives.

5.4 New Objectives

DLS recognises that the processes used to treat waste at the site could change over time as the business develops and in response to external drivers. Should new waste types, new plant, equipment, processes and buildings be required the environmental management representative will undertake a review of the planned changes and identify the environmental aspects that will require management during all phases of development and implementation. Such changes will likely result in new action plans being developed and possibly also Variations to the Permit. DLS recognises that early consultation with NRW is critical to ensuring that the correct outcomes are achieved.

6 SITE SPECIFIC EMS

6.1 Scope of EMS

The management system will need to reflect the environmental risks the waste operations pose to the environment and controls that will need to be in place. For this reason, the scope of the EMS will be directly linked to the Environmental Risk Assessment For the site.

6.2 Exposure Pathways and Pollution Controls

The environmental risk assessment indicates that the proposed operations will not significantly adversely impact the environment provided the site is operated in accordance with a documented EMS. Some of the activities which will need to be documented in the EMS are listed in Table 6-1 with the associated recording forms in Table 6-2. As each of these activities has the potential to impact the environment, each of these will be provided with a procedure and associated standard form.

Table 6-1 Some of the Procedures to be Documented in the EMS

Operation of processing plant
Operation of vehicles and materials handling plant
Noise from site activities
Fire
Flooding
Vehicle movements
Materials handling
Storage of liquids e.g. diesel
Fuel Delivery and offloading
Maintenance of vehicles and plant
Management of surface water run-off
Waste acceptance, placement and inspection
Non-compliant waste management
Management of Quarantine Area
Management of site drainage
Preventative Maintenance Programme – vehicles
Preventative Maintenance Programme – plant
Complaints Management
Product Management
Waste Transportation
Coordinating Site Visitors
Manual Sorting
Loading and Unloading Processing Plant
Stockpiling Waste
Stockpiling Products
Collecting Samples for Testing
Working around plant and vehicles
Personal Protective Equipment (PPE and RPE)
Refuelling Plant and Vehicles
Site Security
Method Statement of Production
Product Inspection and Testing
Product Handling and Storage
Product Non-Conformance
Evaluation of Environmental Aspects
Procedure for Ensuring Compliance with Environmental Legislation

Table 6-2 Some of the Forms to be Included in the EMS

Register of Environmental Aspects
Evaluation of Environmental Aspects under Normal Conditions
Evaluation of Environmental Aspects under Abnormal and Emergency Conditions
Register of Significant Environmental Aspects
Log of Environmental Legislation
Environmental Action Plan
Personnel Skills Matrix
Personal Training Record
Customer Complaint Form
Customer Complaint Log
Obsolete Document Register
Accident and Incident Record
Delegation of Responsibilities
Non-conformance corrective action
Job Specific Method Statements
Maintenance Checklist
Maintenance Record
Environmental Monitoring Records
Calibration Log
Audit Programme
Audit Report
Management Meeting Agenda
Management Meeting Minutes
Non-Compliant Waste Form
Register of Waste Deliveries Form
Daily Process Control Record Form
Product Non-Conformance Form
Register of Waste Deliveries
Record of Non-Compliant Wastes
Emergency Plan
Maintenance, Service, Calibration Schedule
Site Inspection Form
Emergency Drills

6.3 Compliance with Permit Conditions

In the full EMS, the requirements of the Permit will be clearly set out against the relevant sections of the EMS to ensure that all requirements of the Permit are effectively implemented.

7 TECHNICAL COMPETENCE

DLS recognises that an EMS should not be viewed in isolation as many aspects of the business can impact on the successful implementation of the EMS. DLS also recognises that the role of the management representative is not to undertake all of the work required to implement the EMS. For this reason, DLS will document the roles and responsibilities for all personnel. Key authorities and responsibilities will be defined, documented and communicated to all employees.

All employees will be made aware of their responsibility in achieving conformance with the environmental policy and the requirements of the EMS. Table 7-1 summarises the basic requirements for different levels of employees.

Table 7-1 Minimum expectations for Personnel

Title	Responsibility
Top Management	Define and approve issue of the environmental policy Nominate an environmental management representative Review the EMS at set intervals
Management	Provide sufficient resources essential to the implementation and control of the EMS
Management Representative	Ensure establishment of EMS and reporting on performance to the top management
Site personnel	Responsibilities are dependent upon their role

7.1 Operator Competence

DLS recognises that to operate under a Permit, trained and competent staff are required.

DLS will ensure that a written management system is in place that identifies and minimises risks of pollution, including those arising from operations, maintenance, accidents, incidents, non-conformances, closure and those drawn to the attention of the operator as a result of complaints. This system will be subject to regular audit.

The TCP will not be the sole individual responsible for ensuring compliance with the Permit or implementing the EMS as this requires input from all relevant personnel involved with the permitted activities.

7.2 Relevant Training

All relevant staff working on the permitted activities will be trained on the requirement of the Permit and the EMS. To assist with management of training records and needs, DLS will regularly undertake analysis to identify skill gaps and record all training on the relevant forms. DLS will ensure that all relevant staff are:

- trained in aspects that can lead to pollution and the measures to be taken to prevent that pollution.
- trained to deal with accidents.
- aware of responsibilities under the Permit.
- aware of the importance of equipment and plant maintenance.

- competent to operate machinery and provided with safe operating instructions for that equipment or activity.
- appropriately inducted, including contractors.

Records of training will be maintained.

The management of DLS is fully committed to protecting the environment and demonstrating continual environmental improvement. Through effective training, communication and delegation, DLS will encourage all relevant employees to be committed to the full implementation of the EMS.

8 WASTE MANAGEMENT

Ensuring that the waste accepted at the site is in accordance with the Permit is fundamental to its sustainable operation. As part of the full EMS, DLS will document each step to be taken and these actions will be embedded into the staff training programme.

8.1 Waste Acceptance at SSQ

The overall process of waste acceptance to be applied throughout DLS is documented in **DLS-MP-28 Waste Acceptance** and accompanying flowchart **DLS-MP-28-F02**. These are provided in Appendix 1.

The site specific procedures to be followed at SSQ are aligned with these over-arching documents and are summarrised in the Factory Production Control (see **DLS-MP-60 SSQ FPC**). The FPC is provided in Appendix 2.

9 FACTORY PRODUCTION CONTROL

In addition to the procedures for waste acceptance, Factory Production Control (FPC) systems will also be established for the production of aggregates under Quality Protocols, one for the production of aggregates from inert waste (the WRAP Quality Protocol) and one for the production of aggregates from steel slag (Steel Slag Quality Protocol). The FPCs will extend beyond the requirements of the EMS to demonstrate that the waste has ceased to be waste and that a product has been manufactured or waste recovered. However, there will be significant overlap with the EMS to ensure risks to the environment are managed and documented.

The Factory Production Control is document **DLS-MP-60 SSQ FPC**. The FPC is provided in Appendix 2.

10 POLLUTION CONTROL AND MONITORING

10.1 Pollution Control Measures

DLS will ensure that a current Environmental Risk Assessment (ERA) has been completed and is reviewed annually. This is to ensure that the documented management system is directly linked to the potential environmental impacts of the activities. The ERA is document:

- Geotechnology report 2473r2v2d1224 ERA

At this stage, the risk assessment indicates that the proposed activities pose a low risk to the identified environmental and human receptors provided a series of controls are implemented during operations. These controls are detailed in the Emissions Monitoring Plan (EMP). The EMP is document:

- Geotechnology report 2473r4v2d1224 Emissions

10.2 Environmental Monitoring

Despite the environmental risk assessment indicating that the proposed activities pose a low risk to the environment DLS will implement the monitoring set out in the EMP:

- Geotechnology report 2473r4v2d1224 Emissions

11 PLANNED PREVENTATIVE MEASURES

11.1 Maintenance

DLS recognises that many pollution incidents are a consequence of a maintenance failure. To avoid such incidents, a Planned Preventative Maintenance programme will be in place. The Plan will include routine checks of plant, machinery, infrastructure and drainage systems that could influence the environment. The Plan will be directly linked to the Environmental Risk Assessment.

DLS will investigate malfunctions, breakdown or failure of plant and equipment, techniques and near misses, releases to the environment, or impacts on the local amenity. The Plan will be documented.

Most vehicular maintenance will be undertaken in off-site dedicated areas.

11.2 Pollution Prevention

DLS will ensure that all aspects of site development are undertaken in accordance with the current Pollution Prevention Guidance issued by NRW.

12 INCIDENTS & EMERGENCIES

DLS recognises that accidents can cause pollution. For this reason a detailed incident management plan will be developed and will be reviewed as site works progress.

12.1 Emergency Site Plans and Contact Details

As part of the incident management plan a clear diagram of the site layout and access details, along with a schematic representation of the site systems will be produced. Features that will be included on the plan will be:

- access routes and meeting points for emergency services.
- the location of process areas.
- controlled water receptors.
- inspection points to detect pollution.

Alongside the detailed site plans, the response plan will detail the key contact details who may need to be informed in response to an emergency.

12.2 Planning

DLS will assess the potential for negative environmental impacts to arise out of abnormal operating and emergency conditions using a systematic process underpinned by risk assessment. From this assessment, DLS will identify and document significant aspects to enable environmental action plans to be developed. This assessment will be typically annually reviewed.

Reviews will also be undertaken following any accidents and emergencies and in response to any employee reporting a hazard.

DLS recognises that causes of environmental incidents are varied but could include:

- delivery and use of materials.
- overfilling containment vessels.
- plant or equipment failure.
- containment failure.
- fires, explosions or failure to contain firefighting water.
- incompatible materials coming in contact.
- uncontrolled reactions.
- Vandalism.
- flooding.

Any of these incidents could affect:

- surface waters, aquatic ecosystems, groundwater and soil.
- air quality by producing toxic fumes and airborne pollutants which may damage human health, wild and domestic animals and ecosystems.
- thermal radiation which can harm people and the environment.

An overview of the aspects to be included and adopted in the plan are provided in Table 13-1.

Table 12-1 Emergencies to be Evaluated as part of full EMS

Possible Accident/ Incident	What Would The Harm Be?	How will DLS Reduce Likelihood of Accident Occurring?	What To Do If It Happens?
Spillage from Vehicle e.g. diesel delivery	Contamination of land/water/air, injury to individuals.	Ensure all materials are secured before transport; containers are suitable to hold the material and are not damaged. Also follow risk assessment procedures to minimise risk of incident occurring.	Procedure to be listed in emergency plan
Vehicle Fire	Damage to equipment/vehicle/plant/ buildings, contamination to land/ water/air, injury to individuals and inconvenience to community.	Ensure preventative maintenance programme is implemented including daily checks by drivers.	Procedure to be listed in emergency plan
Vehicle Breakdown	Damage to vehicle, injury to individuals.	Ensure preventative maintenance programme is implemented including daily checks by drivers.	Procedure to be listed in emergency plan
Vehicle Accident	Damage to vehicle, injury to individuals.	Ensure preventative maintenance programme is implemented including daily checks by drivers. Ensure staff are trained in use of vehicles and plant.	Procedure to be listed in emergency plan
Injury (Minor/Major)	Injury to individuals, damage to equipment.	Ensure all employees follow the procedures outlined in risk assessments when carrying out specific tasks.	Procedure to be listed in emergency plan
Plant & Property Damage	Injury to individuals, damage to equipment.	Ensure all employees follow correct procedure when operating equipment.	Procedure to be listed in emergency plan
Flooding	Injury to individuals, damage to infrastructure and off-site mobilisation of waste and potential contaminants.	Layout of site to accommodate predicted flood extent. Ensure emergency plan is in place and staff and visitors are aware of emergency responses and access / egress routes.	Procedure to be listed in emergency plan

12.3 Establishment of Contingency Actions

Based on the assessment of abnormal and emergency conditions DLS will develop relevant emergency response procedures. Where necessary, additional training will be organised and documented. The procedures will also detail the internal/external communication procedure during and after the occurrence of abnormal and emergency conditions.

12.4 Testing of Emergency Preparedness

DLS will periodically test all procedures where practicable. The results of the tests will be documented.

13 COMMUNICATION AND COMPLAINTS

13.1 Internal Communication

DLS is committed to ensuring that the requirements of the Permit and the EMS will be fully implemented. One of the key ways of achieving this is through clear communication with all employees to ensure that the requirements are understood, available and fully integrated to routine site work. This will be achieved by various means including signage, meetings, environmental awareness training sessions, tool-box talks, inductions, signage and posters. Particular attention will be paid to ensure that sub-contractors are aware of the relevant requirements.

The waste permit, and all relevant DLS procedures will be made available to all staff. Copies of waste permits will be put on display in the site office. During training and site inductions, all staff involved with the operation will be made aware of the measures required to protect the environment and the requirement of the Permit. Toolbox talks will regularly use these reference materials. Third parties, such as site visitors, can also access the documentation in hard copy or request digital versions.

13.2 External communications

Dialogue with external parties may include submittal of information to external parties, receipt of requests for information, receipt of complaints and dialogue with NRW. In the majority of cases, the Technically Competent Person (TCP) or Site Manager will be the initial point of contact. All communication will be documented.

DLS takes complaints seriously and will take the necessary actions to investigate the complaint. If a complaint is valid DLS will:

- identify the cause.
- minimise the impact of the activity causing the problem.
- investigate the root cause of the problem.
- take steps to ensure the problem is not repeated.
- record the complaint and what actions were taken to investigate and resolve it.
- amend the EMS if necessary.

14 MONITORING AND MEASUREMENT

14.1 Proof of Control

DLS recognises that a key aspect of any EMS is to document the operation of the EMS so that its effectiveness can be scrutinised and any shortcomings identified. This will be achieved through thorough relevant training and routine assessment of working instructions and records for both employees, contractors and suppliers.

14.2 Monitor and Measure

DLS will document implementation of the proposed waste operation and pollution control measures adopted. Records shall include waste acceptance, waste delivery, waste placement, preventative maintenance programmes, product production and environmental monitoring.

15 INTERNAL AND EXTERNAL AUDITS

The environmental management representative will establish a rolling audit programme that ensures each aspect of the EMS is audited at least annually. More frequent audits will be undertaken on the more sensitive procedures and aspects. The principle aim of the audit will be to determine whether or not the EMS conforms to planned expectations and is being effectively implemented and maintained. The environmental management representative will provide feedback regarding the audit process to management. The audit findings will be recorded.

16 NON-CONFORMANCE, CORRECTIVE & PREVENTIVE ACTION

16.1 Continual Improvement

Through monitoring of performance, DLS will seek to identify non-conformance issues requiring action to ensure continued environmental performance and full implementation of the EMS. DLS will seek to identify non-conformance issues through a variety of means including outcomes of audits, incident reports, reviews of legislation requirements and complaints.

16.2 Investigation of Failings

Following identification of non-conformance issues, the environmental management representative will lead an investigation into the root causes and identify ways in which the issues can be avoided in the future. The review will also aim to identify any ways in which the EMS may be improved. This may require specialist input from internal and external parties. This process will lead to corrective and preventative action plans being developed and tracked.

17 RECORDS, REPORTING AND NOTIFICATIONS

The Permit will require records to demonstrate that the activities are in compliance with the EMS.

17.1 Controlled documents

This summary EMS outlines some of the relevant procedures and forms that will be required to document the proposed waste activity. All documents will be controlled and issued by the Technically Competent Person (TCP). One of the responsibilities of the environmental management representative is the maintenance of this documentation.

17.2 Location of documents

All relevant documents will be available on site and routinely backed up.

17.3 Review, Update and New Documentation

DLS will periodically review the EMS. Only authorised personnel are able to make amendments to documentation in consultation with the TCP Environmental management. All employees will, however, be encouraged to provide feedback regarding the documentation to ensure it remains fit for purpose.

17.4 Document Issue and Removal

DLS will ensure that all current versions of the documentation are reviewed, updated and issued to all the relevant parties. Any documentation not required will be clearly identified through the use of an obsolete records system.

17.5 Document and Record Retention

DLS will ensure that all documentation will:

- be legible.
- be made as soon as reasonably practicable.
- if amended, be amended in such a way that the original and any subsequent amendments remain legible or are capable of retrieval.
- be retained for at least 6 years unless they relate to off-site environment effects or matters relating to the condition of the land, groundwater and surface water, in which case they will need to be retained until the Permit is surrendered.

17.6 Reporting to NRW

DLS will report relevant waste records to NRW at the required intervals set out in the Permit.

Report 3
Summary Environmental Management System

SSQ MATERIALS RECYCLING FACILITY LLANWERN

Appendix 1
Waste Acceptance Procedures

Report Number 2473r3v3d0625

DLS Waste Acceptance Management Plan

1.0: Purpose

This document is part of the company Integrated Management System to facilitate the measures taken by DLS for the acceptance of waste materials for transportation, treatment or disposal. This document facilitates the required control to reduce environmental impacts as documented in the DLS Environmental Aspects Register for sites and operations based within Tata Steel Port Talbot Works, and to comply with current waste legislation.

It is a permit requirement to control the acceptance of wastes to ensure that all wastes can be treated and disposed correctly. All accepted wastes must be, where reasonably practical, inspected to ensure compliance and rejected if the criteria within this document are not met.

This document is linked to the commitments of the DLS environmental policy to manage and control waste treatment/disposal in a safe and responsible manner, to prevent pollution and to comply with legislative and permitted requirements.

2.0: Responsibilities

The Environmental/Waste Manager is responsible for ensuring that appropriate support, procedures and information (and waste classification if required) is provided to Contract and Site Managers to ensure the effective implementation of the Waste Acceptance Criteria (WAC) Management Plan. The Environmental/Waste Manager is also responsible for the review, subsequent changes and publication of this Management Plan.

The Site / Operation Manager is responsible for implementation of the Management Plan ensuring that all criteria for waste acceptance are met and documented. This includes the record keeping of all wastes that are transported and/or received.

3.0: Communication

The DLS Environmental Manager will communicate any changes to or new publications of the Waste Acceptance Criteria procedures outlined within this Management Plan or any special considerations required for specific waste types to the Contract/Site Managers.

The Contract/Site Manager will communicate any additional requirements or new provisions required within the Waste Acceptance Criteria Management Plan to the DLS Environmental Manager. All incidents or any compliance failures must be reported by the Site Manger to the Environmental Manager immediately.

The Environmental Manager will report any WAC breaches to the Client Environmental Department, Local Council and Natural Resources Wales within 24 hours of occurrence.

4.0: Waste Classification

All wastes requires basic classification to be carried out to determine waste type, EWC Code, Hazardous Properties, handling requirements and treatment/disposal requirements. This classification is to be carried out by an competently trained person (DLS/Client/Consultant) prior to waste being accepted for haulage and/or treatment/disposal.

All wastes are classified using the Guidance on Classification and Assessment of Waste Technical Guidance WM3 document and complaint with The Hazardous Waste Regulations and List of Waste Regulations.

To use the WM3 guidance, information about the waste must be obtained to correctly classify the waste. These are obtained from history/knowledge of the process which produces the Waste, Material Safety Data Sheets (MSDS), online harmonized values for known materials or though laboratory testing and analysis.

For waste treatment / disposal facilities operated on client sites, it is the responsibility of the client (waste producer) to produce the Basic Characterisation. For any waste produced by DLS, off client controlled sites, this process (and the previously described means of obtaining the data on the hazardous properties) is to be carried out, and documented by DLS.

When soils / excavated materials are considered for classification, the procedures and emails listed in section 8 must be used.

5.0: Waste Acceptance and Rejection Procedure

Waste acceptance / rejection is initially determined and classified through DLS' role in the waste transfer. DLS will either be the haulier and/or the transferee. In both situations there is a basic waste acceptance / rejection procedure that details what is required to happen if a waste is accepted or rejected. For treatment/disposal (transferee) and for haulier there is a flow chart to be followed at managerial level before waste is to be considered for acceptance (DLS-MP-28-F02 DLS 'Waste Acceptance Flow Chart'). Once these procedures have been followed and waste can be conditionally accepted there are site/service specific requirements and procedures to be carried out at operator level.

5.1: Overall Procedure for all Waste Acceptance.

1. All waste accepted at source (haulage service) or onsite (treatment/disposal facilities) will have a visual inspection prior to be accepted. This is to ensure that the waste:
    a. Is acceptable at the facility / destination.
    b. Matches the information on tipping note or season ticket.
    c. Does not contain any visible contamination / banned substances
2. Operator will provide written acceptance of waste.
3. All records of waste accepted to site are kept in site office (time & date, origin, type, vehicle, originating department & waste carrier). These records are kept electronically and on paper format for a minimum of 2 years.

5.2: Overall Procedure for Dealing with all Non-conforming Waste.

If waste is not accepted the following procedures have to be adhered to by the operator rejecting the material:

1. A record will be kept by either the site control operator (treatment/disposal facilities) or the Services Manager (haulage). These records will include:
    a. Date and time
    b. Description of waste
    c. Details of non-conformance
    d. Details of action taken
    e. Department name and address of waste producer
    f. Vehicle type
    g. Vehicle reg
    h. Waste carrier name (if applicable)
    i. Transfer note number (if applicable)
2. Sent back to the originator (treatment/disposal facilities) or left at source (haulage).

In the event that the non-conformity is discovered after being accepted at a waste treatment/disposal facility the following additional procedures must be followed:

3. Inform the environment department / environmental agency if waste has been rejected after it was accepted onto a treatment / disposal facility.
4. It will be loaded back onto haulier.
5. If this is not possible the waste will be quarantined and environment dept informed.
6. If waste has to be stored on site, a suitable container will be made available for waste to be stored safely and securely.

7. All waste sent off site will have transfer note non conformity section signed by tip operator. Records of non-conforming waste are kept in site office for 2 years minimum.

5.3: Treatment & Disposal Facilities

For each facility there may be additional requirements and different tolerances for wastes that can be accepted. These are highlighted in the Contract Plans / FPC documents.

5.4: Haulage Service

For each service there may be additional requirements and different tolerances for wastes that can be accepted. These are highlighted in the Contract Plans / JMS.

7.0 Documentation

All master documents / forms / registers listed in DLS-MP-28 are to be kept by the SHEQ department for control and review. Each site / service is required to keep copies of the relevant referenced forms / documents / registers for operational reference. Each site / service must retain copies of all Waste Transfer Notes for a minimum of 2 years (7years for landfills due to tax implications).

All wastes accepted for transportation / treatment / disposal must be recorded in the relevant digital reporting systems listed in the corresponding DLS department documentation by the site / service manager and saved to the DLS server. Where required, it is the responsibility of the service / site manager to report this information to the client upon request.

8.0: Other Documents

- Tata - Sampling and Classification Flow Chart
- Tata - Sampling and Classification of Excavated Material
- J Davis Email - HAA Soils Ground Excavations _ Rubble Testing Protocol
- HAA Soils Ground Excavations _ Rubble Testing Protocol

DLS Waste Acceptance Flow Chart

Waste Enquiry for Treatment, Disposal or Transportation

Key
Operator Level
Manager Level

DARLOW LLOYD & SONS
Part of the Darlow Lloyd Group Ltd

Is the Waste from a previously accepted operation / job?
- No → Is there a Basic Characterisation for the waste?*
  - No → Basic Characterisation needs to be completed by the waste producer and sent to DLS → REJECT THE WASTE REQUEST.
  - Yes (updating needs) → Basic Characterisation document needs to be updated by the waste producer and sent to DLS → REJECT THE WASTE REQUEST.
- Yes → Is the Basic Characterisation up to date and present?*
  - No → Is there a Basic Characterisation for the waste?*
  - Yes → Is the waste listed on the Accepted Waste Lists (DLS-28-F03) for any of the DLS managed Treatment/Disposal sites?
    - No → REJECT THE WASTE REQUEST.
    - Yes → Does the waste type need additional testing or documentation for waste acceptance at a facility or for classification?**
      - Failed / Not submitted → REJECT THE WASTE REQUEST.
      - Passed / submitted → Is there a Season Ticket (DLS-MP-30-F02) or a relevant / correct Waste Transfer Note or Hazardous Waste Consignment Note?***
      - No → Is there a Season Ticket (DLS-MP-30-F02) or a relevant / correct Waste Transfer Note or Hazardous Waste Consignment Note?***
        - No → Can a Waste Transfer Note / Hazardous Waste Consignment Note be obtained from the originator?
          - No → REJECT THE WASTE REQUEST.
          - Yes → ACCEPT THE WASTE REQUEST AND SCHEDULE THE COLLECTION OR ACCEPTANCE
        - Yes → ACCEPT THE WASTE REQUEST AND SCHEDULE THE COLLECTION OR ACCEPTANCE

ACCEPT THE WASTE REQUEST AND SCHEDULE THE COLLECTION OR ACCEPTANCE

Are DLS hauling the Waste?
- No → RECIEVE THE WASTE FOR AT SITE
- Yes → DLS operator despatched to collected the waste as scheduled

Have the Operator Checks (DLS-MP28-F04) been carried out at the waste origin and comply with the facility / service requirements?
- No → LOAD/SKIP NOT TO BE MOVED. PHOTOGRAPH THE SKIP/LOAD. REPORT TO DLS MANAGER. DLS MANAGER TO INFORM WORKS AREA & SUBMIT PHOTOS. RESCHEDULE COLLECTION FOR WHEN ISSUE(S) HAVE BEEN RESOLVED.
- Yes → Is it safe to approach and collect the skip/material? - Is there sufficient access? The vehicle/skip is not overloaded, there are no overhanging materials, no overhead obstructions or any obstructions due to services / equipment or machinery?
  - No → LOAD/SKIP NOT TO BE MOVED. PHOTOGRAPH THE SKIP/LOAD. REPORT TO DLS MANAGER. DLS MANAGER TO INFORM WORKS AREA & SUBMIT PHOTOS. RESCHEDULE COLLECTION FOR WHEN ISSUE(S) HAVE BEEN RESOLVED.
  - Yes → Are there signs of visual contamination or is there adequate reason to believe there is contamination?
    - Yes → Does the contamination have a potential to impact on health & saftey if disturbed?
      - Yes → LOAD/SKIP NOT TO BE MOVED. PHOTOGRAPH THE SKIP/LOAD. REPORT TO DLS MANAGER. DLS MANAGER TO INFORM WORKS AREA & WORKS ENVIRONMENTAL DEPARTMENT AND SUBMIT PHOTOS. WORKS AREA TO RESOLVE ISSUE BY SUBMITTING DOCUMENTATION/TESTING CERTIFICATION THAT THE NON-CONFORMANT MATERIAL IS NOT HAZARDOUS THEN RESCHEDULE COLLECTION. IF THE MATERAIAL CAN NOT BE CONFIRMED AS NON-HAZARDOUS, TREAT AS HAZARDOUS AND TESTING IS TO BE CARRIED OUT. IF THE MATERIAL IS CONFIRMED TO BE HAZARDOUS, LICENCED SPECIALIST SERVICES ARE TO REMOVE THE MATERIAL AND SURROUNDING CONTAMINATION AS REQUIRED AND EVIDENCE TO BE SUBMITTED TO DLS BEFORE THE SKIP/LOAD CAN BE SERVICED.
      - No → RECIEVE THE WASTE FOR AT SITE
    - No → RECIEVE THE WASTE FOR AT SITE

RECIEVE THE WASTE FOR AT SITE

Have the Operator Checks (DLS-MP28-F04) been carried out at the waste facility and comply with the facility requirements?
- No → LOAD REJECTED. REASON FOR REJECTION IS RECOREDED AND REPORTED TO DLS MANAGER. DLS TO CONTACT WORKS AREA AND INFORM REASON FOR REJECTION. LOAD TO BE RETURNED TO ORIGIN DEPARTMENT UNTIL ISSUES HAVE BEEN RESOLVED.
- Yes → During or after the deposition of the waste, has any non-conformant waste / contamination been discovered or is the waste different from the EWC code / waste description?
  - Yes → WASTE PHOTOGRAPHED & QUARANTINED. DLS MANAGEMENT INFORMED. DLS MANAGER TO INFORM WORKS AREA & WORK ENVIRONMENTAL DEPARTMENT AND SUBMIT PHOTOS. **** → Does the contamination / waste have a potential to impact on health & safety if disturbed?
    - Yes → AREA TO BE QUARENTINED NO PERSONNEL TO APPROACH THE WASTE. NOTIFICATION SENT OUT OF SITE CLOSURE TO ALL STAKEHOLDERS. WORKS AREA TO RESOLVE ISSUE BY SUBMITTING DOCUMENTATION/TESTING CERTIFICATION THAT THE NON-CONFORMANT MATERIAL IS NOT HAZARDOUS. IF THE MATERAIAL CAN NOT BE CONFIRMED AS NON-HAZARDOUS, TREAT AS HAZARDOUS AND TESTING IS TO BE CARRIED OUT. IF THE MATERIAL IS CONFIRMED TO BE HAZARDOUS, LICENCED SPECIALIST SERVICES ARE TO REMOVE THE MATERIAL AND SURROUNDING CONTAMINATION, AS WELL AS PROIVDE ENVIRONEMENTAL MONITORING TO AREA AS REQUIRED AND EVIDENCE TO BE SUBMITTED TO DLS BEFORE AREA CAN BE REUSED.
    - No → Can the waste be easily removed from site?
      - No → Can the waste be treated onsite to achieve compliance?
        - No → EXCAVATE THE WASTE AND ANY SURROUNDING CONTAMINATED MATERIAL FOR REMOVAL AND TREATMENT OFFSITE.
        - Yes → TREAT WASTE TO ACHIEVE SITE COMPLAINCE
      - Yes → REMOVE WASTE AND RETURN TO ORIGINATOR
  - No → Is there any onsite testing or offsite chemical testing required to demonstrate compliance of the material?
    - Yes → Does the onsite testing of the samples match the requirements set in the basic characterisation or permit conditions?
      - No → WASTE PHOTOGRAPHED & QUARANTINED. DLS MANAGEMENT INFORMED. DLS MANAGER TO INFORM WORKS AREA & WORK ENVIRONMENTAL DEPARTMENT AND SUBMIT PHOTOS. ****
      - Yes → Does the offsite chemical testing analysis of the samples match the requirements set in the basic characterisation?
        - No → WASTE PHOTOGRAPHED & QUARANTINED. DLS MANAGEMENT INFORMED. DLS MANAGER TO INFORM WORKS AREA & WORK ENVIRONMENTAL DEPARTMENT AND SUBMIT PHOTOS. ****
        - Yes → PROCEED WITH TREATMENT / BURIAL OPERATIONS
        - N/A → PROCEED WITH TREATMENT / BURIAL OPERATIONS
      - N/A → Does the offsite chemical testing analysis of the samples match the requirements set in the basic characterisation?
        - No → WASTE PHOTOGRAPHED & QUARANTINED. DLS MANAGEMENT INFORMED. DLS MANAGER TO INFORM WORKS AREA & WORK ENVIRONMENTAL DEPARTMENT AND SUBMIT PHOTOS. ****
        - Yes → PROCEED WITH TREATMENT / BURIAL OPERATIONS
        - N/A → PROCEED WITH TREATMENT / BURIAL OPERATIONS
    - No → PROCEED WITH TREATMENT / BURIAL OPERATIONS

ALL waste acceptance issues, are to be logged in the Site Dairy / Managers Diary, reported to the DLS Environemental Manager, and if required a DLS incident report will be written up and published.

* It is the responsibility of the waste *producer* to provide a basic characterisation with all the supporting evidence of the characterisation to DLS.
** WAC testing for Haz Landfill. Lagging / Insulation / Refurbishment Wastes / Ceiling Tiles all require MSDS sheets & Asbestos Surveys. Refractory bricks require MSDS sheets and depending on composition, laboratory testing to determine if crystalline structure has changed.
*** It is the responsibility of the waste producer to provide a correct and fully completed season ticket / Waste Transfer Note / Hazardous Waste Consignment Note which suitably covers the requested waste transfer.
**** At the Morfa Landfill, if the waste materials fails waste complaince, DLS must inform the Client Environmental Department and advise they are to inform the Regulator of the WAC failure.

Report 3
Summary Environmental Management System

SSQ MATERIALS RECYCLING FACILITY LLANWERN

Appendix 2
Factory Production Control

Report Number 2473r3v3d0625

DLS Aggregate Recycling - Llanwern South Side Queensway Factory Production Control

Section 1.0: Aggregate Waste Transfer Operation

Darlow Lloyd & Sons Ltd (DLS) will operate a mobile materials recycling operation at the Llanwern South Side Queensway Location (SSQ). The operation will process wastes from the steelmaking process present at SSQ and also soil from off-site external parties in line with waste regulations and permit controls. Having been processed, the material will either be used on-site by Tata, (typically as aggregate) or sold on the open market as aggregate. Soil will be transferred to ongoing landfill capping projects. This document focusses on the Factory Production Control (FPC) that will be adopted at each of the treatment areas. .

1.1: Objective of Document

For operators to benefit from end of waste controls, provided by compliance with the QPs, the operators must:

- use only the correct waste as feedstocks
- make only the permitted products
- comply with the relevant European standard, specification and quality controls for the product being manufactured with all required tests being met and the aggregate needing no further treatment, weathering (in the case or size reduction before use
- have a manual of Factory Production Control (FPC)
- have marked the product to the CE requirements of the Construction Products Regulations
- transport, store, handle and process the wastes and the final product following good practice guidelines
- supply the customer with delivery documents confirming the product meets the quality protocol

BS EN 13242:2013 *Aggregates for unbound and hydraulically bound materials for use in civil engineering work and road construction* specifies an FPC system to ensure that aggregates for unbound applications conform to the relevant requirements of the standard. PD6682-6 provides further guidance for UK users of BS EN 13242.

In the UK, the required level of attestation of conformity to European Standards for aggregates is 4 (with the exception of aggregates for use in skid-resistant surfacing's). This means that the aggregate producer (DLS) must operate a "first party" system of FPC following initial type testing. Certification and surveillance by notified accreditation bodies ("third parties") is not required.

This FPC provides a record of all policies and methods for managing the waste material - from waste arriving at the facility, through to storage, processing, transport, and delivery of quality protocol approved products. The FPC is essentially a management system focussed on the production process which aims to ensure that product quality is consistently maintained to the required specifications. Evidence of its adoption and implementation is achieved through scheduled controls and tests on measuring equipment, raw materials and constituents, processes, machines and manufacturing equipment and finished products, including material properties in products. Most importantly, the system provides for conformity assessment and for the management of non-conforming products.

This Factory Production Control (FPC) will be used to control and monitor recycled aggregate production to ensure that the required product characteristics are achieved and maintained consistently.

1.2: Company Policies

DLS operates under an integrated Business Management and Safety System certified to ISO 9001, ISO 14001 and ISO 45001.

Section 2.0: Site Management

The effective running and management of the site is paramount to its success and requires structure, adequate training, safety and delegation of responsibilities to the correct personnel. This section outlines how,

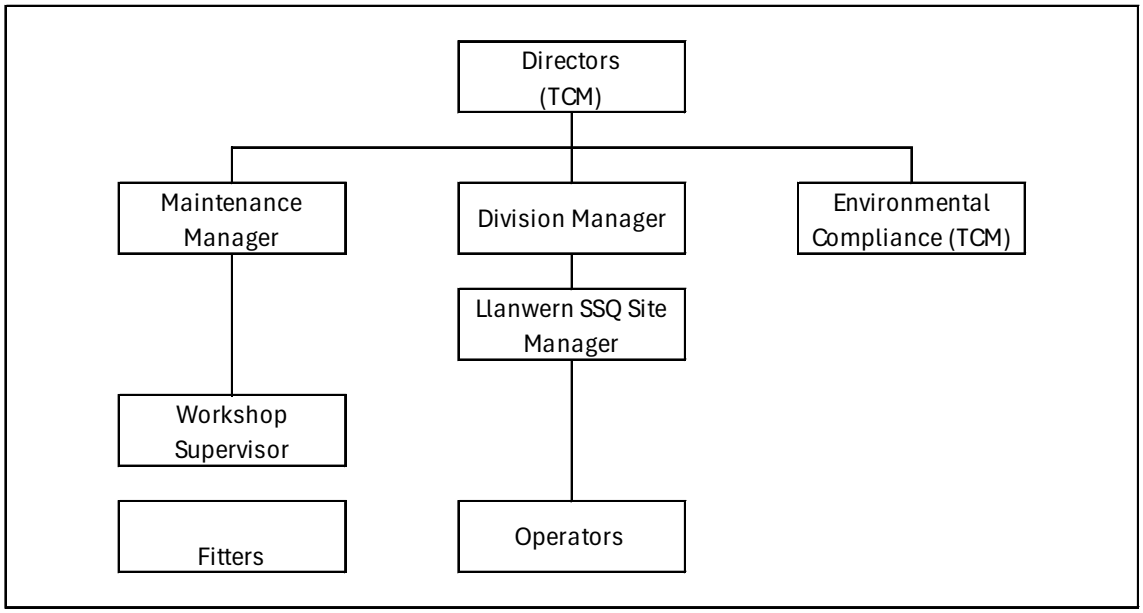
- the site is managed
- tasks are assigned
- the day to day operation of the facility is carried out
- required training for all personnel working on site

This is the framework for the expectation for all personnel working on site and of the company's responsibility to train and safely carry out operations onsite.

2.1: Personnel Structure

The responsibility and authority for the implementation of the FPC ultimately lies with the Chief Operating Officer (COO) of DLS. The COO will appoint a Management Representative for the FPC and ensure that all relevant members of the management team are aware of their responsibilities. This will include details of the controls and actions required to prevent product non-conformity and the identification of procedures to follow for managing quality deviations. The current management structure is summarised in Figure 1.

Figure 01: Personnel Structure of the Operation



2.2: Operational Staff

A number of operational staff are required to follow procedures as part of the FPC and it is important that they are made aware of the documented procedure as part of their day to day operations. The roles identified are:

- Management
- Machine Operators
- Vehicle Drivers
- Weighbridge Operator

All operational staff will be adequately informed by the identified managers and trained with regards to the relevance and importance of their activities and how they contribute to the achievement of the FPC implementation.

2.3: Roles & Responsibilities on Site

All personnel have specific roles and responsibilities to perform on site in order to ensure that all tasks are carried out correctly, safely and efficiently. With an operation of this size it is crucial that tasks are effectively delegated to the appropriate person so all parties involved can work without incident. To ensure this, specific roles are assigned within the personnel structure so that all tasks are completed effectively reducing any potential impact on other people working on site. With managerial approval, some of the tasks can be delegated providing the individual asked has been correctly trained to do the task. However, major responsibilities cannot be re assigned. DLS-MP-40-D01 details the roles and responsibilities of the following key members of personnel:

- DLS Compliance / TCM
- Site Manager
- Site Supervisor
- Site Administrator / Weighbridge Operator
- Materials Technician (samples / testing / Results)
- Plant / Machine Operators
- Material Hauler Drivers
- Banksman
- Labourer
- Maintenance Manager
- Fitter / Welder

2.4: Recruitment

The recruitment of personnel will be undertaken by the Site Manager and depending on the nature of the role to be filled, the Operation Manager.

2.5: Training Requirements

Training is undertaken by the Management Team. It will be their responsibility to identify training needs and organise the required training in accordance with the DLS Business Management Systems. All training records will be kept and maintained within the DLS SHEQ department.

All personnel intending to work on site must have adequate training and attended the appropriate courses before being allowed to work on site. Depending on what role and the tasks appointed to them the level of training will vary, however there are certain training requirements which all personnel must undertake in addition to the task specific training.

All staff working at the mobile operation have individual working records which are held at the DLS offices in accordance with the company Business Management System. Training will involve informal “tool box” talks and also proprietary external training when required. Specific to the FPC, staff will be trained in the appropriate procedures as required

- Acceptance criteria for the operation
- Procedures for non-compliant input wastes and output products
- Sampling and testing of products
- Product storage and inspection.

Other Training required for onsite include:

- Company Inductions
- Site Inductions

- Machine Licences - *CPCS / NPORS Licence or House Licences*
- Wamitab Training (TCM)
- Risk Assessment & Safe Working Procedure
- PICWP Training

2.6: Onsite Equipment

Th following equipment will be required to be utilised as a minimum to achieve waste treatment, however as operational requirements change more

- Weighbridge – Weigh materials in and out of site
- Wheel Wash – Ensure no waste / mud is taken onto the public roads
- Power Screen with over band magnets – screen and size material as required while removing Fe products
- Excavator – Load screen, manage stockpiles, use magnetic attachment to separate ferrous materials.
- Front Loading Shovel - Remove materials from screens to stock piles. Weigh production materials, stockpile management, load out vehicles with product.
- Wash plant (temporary use in Area 2-10)
- Mobile fuel bowser – supply equipment with fuel
- Dump trucks – Internal haulage of materials around site
- Water bowser – Dust suppression for site (small quantities of water taken from on-site ditches)
- Office & welfare facilities

In accordance with existing Business Management Systems, each item of plant will have details relating to:

- Operating Procedures
- Planned Preventative Maintenance Schedules and records of their implementation
- Register of operational staff trained in the use of each item of plant
- Register of operational staff holding the appropriate CPCS / NPORS standard

2.7: Document and Data Control

This FPC manual, waste permit, and all relevant DLS procedures will be made available to all staff. Copies of waste permits will be put on display in the site office. Records will be maintained during the following stages:

a) FPC: Initial Enquiry and Waste Characterisation
b) FPC: Waste Acceptance and Delivery
c) FPC: Waste Treatment and Product Manufacturing
d) FPC: Product Enquiry and Distribution

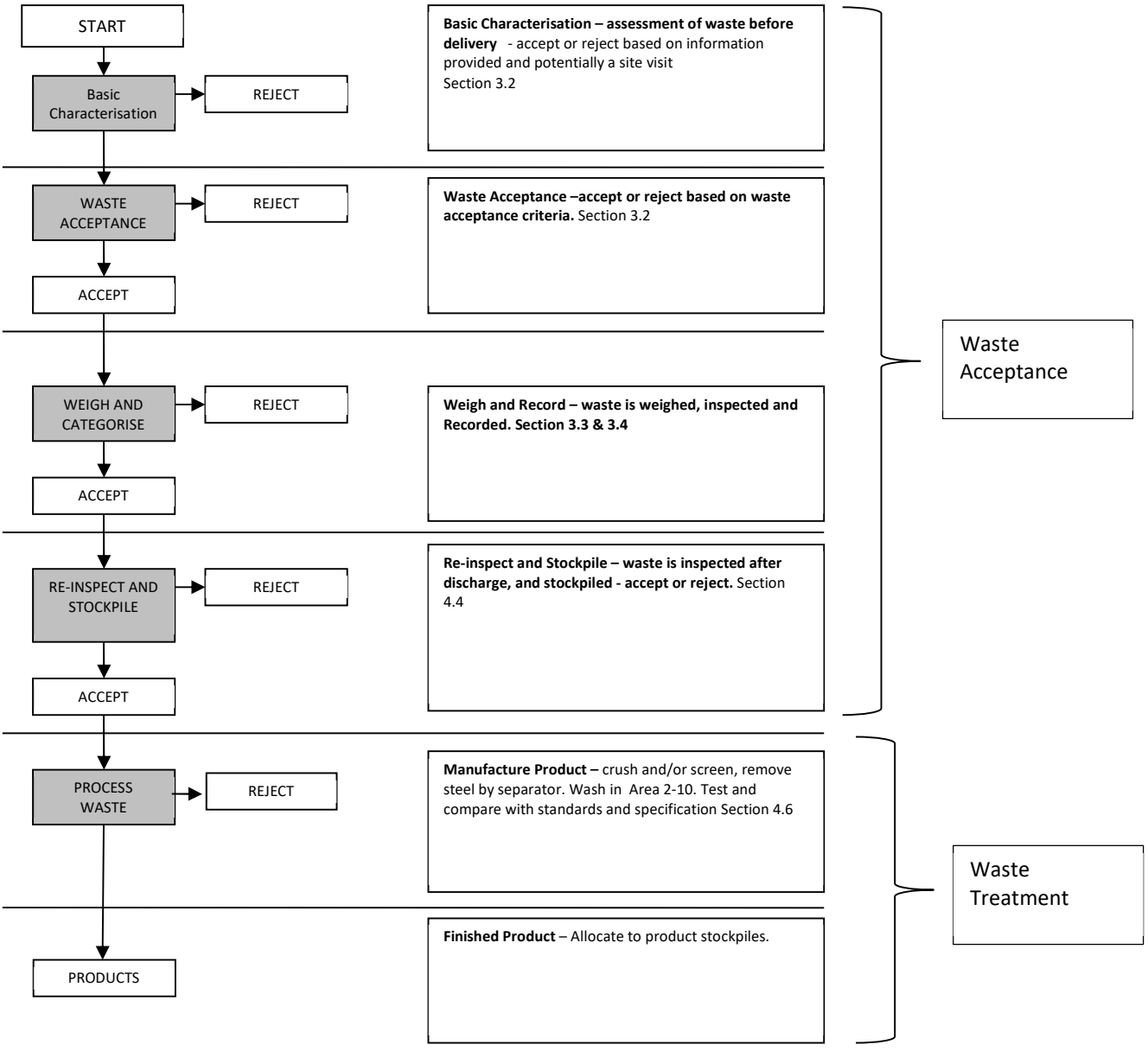
2.8: Surveillance & Management Review

This FPC system will be audited and reviewed on a 6-monthly basis by the management team, led by the Director, to assess its suitability and effectiveness. The records of these reviews will be recorded by the office manager and kept at the office.

3.0 Waste Acceptance

All waste received at the operation is subject to regulatory waste controls. This section convers how DLS manage the reception of waste and the controls in place to satisfy regulatory compliance. Figure 02 below provides an overview of the waste controls and transition from waste to product.

Figure 02: Waste Acceptance and Treatment Overview.



3.1: Material permitted for Waste Acceptance

Figure 03 summarises the acceptable wastes and their EWC codes that can be received at the SSQ. These are to be processed under Factory Production Control (FPC) to produce aggregates. This FPC applies to these wastes and aggregates.

Figure 03: Permitted Waste Materials for Acceptance

EWC Code	Description of Wastes to be Accepted	EWC Entry Type	Relevant Quality Protocol
01 04 08	Waste gravel and crushed rocks other than those mentioned in 01 04 07 may include excavation from mineral workings	MN	WRAP
01 04 09	Waste sand only	AN	WRAP
10 02 01	Waste from the processing of blast furnace slag / steel slag	AN	QP Steel Slag
10 02 02	Unprocessed blast furnace slag / steel slag	AN	QP Steel Slag
10 02 99	Slab yard refuse*	AN	QP Steel Slag
10 11 03	Waste glass-based fibrous materials allowed only if: Wastes without organic binders	AN	Wrap
10 12 08	waste ceramics, bricks, tiles and construction products (after thermal processing)	AN	WRAP
10 13 14	Waste concrete only	AN	WRAP
15 01 07	Glass packaging	AN	WRAP
16 11 04	Refractory	MN	WRAP
17 01 01	Concrete (excluding concrete slurry)	MN	WRAP
17 01 02	Bricks	MN	WRAP
17 01 03	Tiles and ceramics	MN	WRAP
17 01 07	Mixtures of concrete, bricks, tiles and ceramics other than those mentioned in 17 01 06	MN	WRAP
17 02 02	Glass (Must not include fibreglass or glass fibre)	MN	WRAP
17 03 02	Bituminous mixtures	MN	WRAP
17 05 04	Soil and stones other than those mentioned in 17 05 03 Must not contain any contaminated soil or stone from contaminated sites.	MN	WRAP
17 05 06	Dredging spoil other than those mentioned in 17 05 05 allowed only if: Inert aggregate from dredgings. Must not contain contaminated dredgings. Must not contain fines.	MN	WRAP
17 05 08	Track ballast other than those mentioned in 17 05 07	MN	WRAP
17 09 04	Mixed construction and demolition waste comprising granular material	MN	WRAP
19 12 05	Glass Does not include glass from cathode ray tubes.	AN	WRAP
19 12 09	Minerals (for example sand, stones)	AN	WRAP
20 01 02	Glass Must not include fibreglass.	AN	WRAP
20 02 02	Garden and park wastes (including cemetery waste) – soil and stones Must not contain contaminated stones from garden and parks waste.	AN	WRAP

EXCLUSIONS:
Wastes having any of the following characteristics shall not be accepted:

- Consisting solely or mainly of dusts, powders or loose fibres
- Hazardous wastes
- Slurry Wastes
- Wastes in liquid form

NOTES:
10 02 99: Slab yard Refuse is a material created from where recycled BOS Slag has been used as hard standing at a Steel Work Slab Yard, and has been worn down to a -25mm material, then scraped up to be repossessed. This material is chemically the same as Steel Slag but has been additionally been used and therefore has additional production steps which is differs from 10 02 01 Steel Slag

3.2: Waste Classification

All wastes require basic classification to be carried out to determine waste type, EWC Code, Hazardous Properties, handling requirements and treatment/disposal requirements. This classification is to be carried out prior to the waste being accepted for treatment.

All wastes are classified from the Guidance on Classification and Assessment of Waste Technical Guidance WM3 document and complaint with The Hazardous Waste Regulations and List of Waste Regulations.

To use the WM3 guidance, information about the waste must be obtained to correctly classify the waste. These are obtained from desktop survey / material history, Safety Data Sheets (MSDS), online harmonized values for known materials or though laboratory testing

Once the waste has been classified it needs to be written up / submitted via a 'Basic Characterisation'. This document will hold the supporting information that backs ups the decision for its classification in addition to the information regarding the waste origin, testing requirements, waste hierarchy decision and destination of the waste.

It is the responsibility of the waste producer to produce the Basic Characterisation. Once the waste is classified and given a EWC code, it is referenced back to the acceptable list in Table 01 and is only accepted if it matches a code and description specified in the list.

3.3: Waste Acceptance and Rejection Procedure

DLS Operate waste acceptance in line with its Waste Acceptance & Rejection Procedure (DLS-MP-28) that details what is required to happen at operator level if a waste is accepted or rejected. For the facility, there is an overall procedure to be followed at managerial level before waste is to be considered for acceptance. This is shown in DLS-MP-28-F02 DLS 'Waste Acceptance Flow Chart'. Once this procedure has been followed and waste can be conditionally accepted. The material is to be visual inspected (where possible) at the weighbridge then a Gross weight is recorded.

Only waste materials arising off-site will require a Waste Transfer Note (WTN) but all waste will require characterisation and to satisfy the acceptance checks.

1. The driver will wait until the Site Manger / Weighbridge Operator can check their delivery information and supplied Waste Transfer Note (WTN), where relevant.
2. The Site Manager / Weighbridge Operator will confirm the waste is acceptable and that all documentation is available for the waste be brought to site.
3. The driver will be given instructions by the site manager (and if required a site map) for where they need to go on site to unloaded.
4. Where relevant, the driver will receive a Gross weight from the weighbridge (which will be recorded on the WTN).
5. The driver will proceed to the designated discharge point.
6. The driver will proceed to the designated tipping point and wait for a site operator to supervise the tipping of waste.
7. Once tipped the site operator will visually inspect the waste for conformity.
8. The driver will return to the weighbridge to receive a Tare and nett weight which will be completed on the WTN, where relevant.
9. The driver will be issued a copy of the completed WTN confirming the delivery of the waste
10. The haulier will leave the site.

Waste Rejection
Rejection of the waste would involve re-loading the waste back onto the delivery lorry. Waste producers and carriers of non-compliant wastes delivered to the site would be immediately contacted. A method of investigation, action and prevention of further non-compliant loads would be discussed and agreed.

This would typically include:
- Causes of inclusion of non-compliant waste
- Action Plan to prevent further non-compliant waste being delivered
- Agree a location / method of disposal of the delivered non-compliant waste

- Assurances that no further non-compliant wastes will be delivered to the

3.4: Quarantine of Non-Conformant Materials

In the event of non-conformant waste, DLS will set up a designated quarantine area to store materials in a sealed skip if reloading of materials in not available and/or the non-conformant materials are not initially discovered. This area will be clearly marked up and only non-conformant waste are to be stored in this area.

3.5: Digital Recording & Reporting

All waste material delivered to the Aggregate Waste Treatment Operation must be weighed and recorded as it is brought onto site. All production activities are to be reported to the Site Manager. It is the responsibility of the Site Manager to ensure that all incoming Tonnages are acceptable, recorded, stored and reported correctly.

All wastes accepted onto site are to be digitally recorded in a clear and appropriate manner, given a breakdown of loads accepted by:

- Date
- Origin
- EWC code
- Description
- Haulier

3.6: Waste Returns

Every 3 Months, inline with permitting regulations, DLS will submit quarterly waste returns to the regulator for all waste accepted to site and removed from site. This will be carried out by the site TCM

Section 4.0: Storage of Waste and Materials on Site

Once materials have been brought into the processing area, processing is required to enable the material to be recovered. For this, one or more processing methods may be required by trained DLS personnel. Organising the materials and the correct placement and use of the equipment will allow for effective processing. This section covers the physical handling of the materials from movements of unprocessed stock through to the different processing methods and storage, and the administrative side of recording, reporting and the cost allocation and charge of processing the materials.

Mobile screens or crushers are tracked to the stockpiles which require processing. A working platform is constructed from the unprocessed material for an excavator to sit in so it can reach the unprocessed stock and feed the processing equipment.

4.1: Movement of Materials on Site

All materials being deposited ready for processing, are moved into place prior to processing and processed stock must be placed in specifically designated bays in which signs are posted to reduce contamination across different materials.

Once a bay has been sign posted with a designated material, only that specific material type, size, or state of process can be held in that bay. All signs are to be mobile to accommodate changing volumes of stock levels, and all machine operators are to consult the site supervisor for any changes to locations of material bays.

If for any reason a material bay is not sign posted, machine operators are not to add to or remove material without permission from the Site Supervisor or Site Manager. It is the responsibility of the machine operators and Site Supervisor to report missing signs to the management in order to have new signs made.

All movements of material on site must be approved by the site Supervisor or Site Manager, or be outlined in the job brief for processing of that specific material. This applies to the mixing/blending of different material types and sizes.

If possible, screens and crushers will be moved to unprocessed material bays to avoid double handling of materials, and the processed material will be moved in to designated stockpile for each size and type of material. The only time materials will be brought to screens or crushers is when unprocessed stockpile is sufficiently large enough for an excavator to reach the whole stockpile.

4.2: Stockpile Management

The accepted waste loads will travel to the designated location for deposition and storage until ready for use. Detailed below are the procedures for further inspection of the waste during the discharge and stockpiling process.

The waste delivery driver will be given instructions by Operational Staff as to where the waste must be discharged. The waste will only be discharged in the correct waste stockpile. Each specific waste stockpile will be clearly signposted.

The operational staff will observe the tipping process to ensure that the waste is compliant, and that no non-compliant wastes are included or hidden and cross-contamination has not or cannot occur. If unacceptable wastes

are encountered, the driver would be informed and the load put back onto the lorry (by use of the excavator) and returned to the customer. The waste carrier and waste producer would be immediately contacted by telephone of the non-compliant waste being present.

Prior to the material being pushed up into the stockpile any debris or materials identified as being non-compliant will be placed into a designated skip for recovery or disposal. This procedure may involve handpicking of small quantities of wood, plastic and metals etc. This material will be placed into dedicated skips for off-site recovery or disposal.

If the remaining waste is acceptable it will be pushed up into the designated stockpile via the front-loading shovel by the operational staff.
Waste stockpiles will be regularly visually examined and further sorting of non-compliant wastes may take place. The materials removed during subsequent inspections will be placed into designated skips for onward disposal or recovery.

Waste stockpiles will be kept separate and away from any finished products. Every waste and finished product stockpile will be clearly marked with signs identifying the material.

The operational staff will ensure that the stockpiles do not cross contaminate other waste stockpiles or any processed products.

4.6: Fuels, Greases and other Hazardous Substances.

No fuels will be stored at site.

Small quantities of maintenance fluids will be stored appropriately to prevent ground or water contamination. All storage requirements will be in line with DLS-MP-31V2 ‘DLS Hazardous Materials Storage and Spills” procedure and DLS-MP-59 “COSHH” procedure.

Section 5.0: Processing Of Waste Materials

Several of these wastes, identified as WRAP in Table 02, are listed as inert wastes in the WRAP Quality Protocol (WRAP QP) for the *Production of Aggregates from Inert Waste* (October 2013). Provided these wastes are not contaminated, these wastes can be used as feedstocks to produce aggregates. If the requirements of the WRAP QP are satisfied during their production, the aggregates will have ceased to be waste and no longer subject to waste controls.

More recently (2016), the Environment Agency published a series of Quality Protocols (QPs) which outline when a waste derived material can be regarded as a non-waste product and no longer subject to waste controls. One of these QPs is titled *Aggregate from waste steel slag.* If an operator can demonstrate that their production of aggregates meets the standard set out in this QP, and the rules for all QPs, then the aggregates may be regarded as fully recovered and no longer subject to waste controls. As one of the principal wastes, by tonnage, to be processed is slag from the steel making process, commonly referred to as steel slag or BOS (Basic Oxygen Steel) slag, this more recent QP is also applicable. In this document the term steel slag is used.

The following methods (either solely in conjunction with each other) can be used to achieve the specifications set out in the WRAP / Steel Protocol

- Screening (including over band magnets)
- Magnetic Separation
- Eddy current separation
- Crushing

All equipment is to be checked daily for defect and reported to the management Team. The maintenance team is responsible for plant repairs and service schedules to all equipment. Safe operations for using Screens and crushers it to be detailed in the site Job Method Statement.

5.1: Manufactured products

The manufacture of aggregates at the operation will adapt to market demands and specific client requirements. The main products that can be produced and their associated standards are listed in Figure 04.

Figure 04: Potential Products Produced as Required by Client Specifications

Materials	Product Produced																										
	SHW 500					SHW 600																		SHW 800				
	Pipe Bedding - Coarse - Graded	Pipe Bedding - Coarse - Single Size	Pipe Bedding - Fine	Pipe Bedding - All In	Filter / Drain Material	General Granular Fill - Well Graded - 1A	General Granular Fill - Uniformly Graded - 1B	General Granular Fill - Coarse Granular - 1C	General Granular Fill - Wet cohesive material - 2A	General Granular Fill - Dry cohesive material - 2B	General Granular Fill - Stony cohesive material - 2C	General Granular Fill - Silty cohesive material - 2D	Landscaping Fill - Fill for Landscaping - 4	Top Soil - 5A	Top Soil - 5B	Selected Granular Fill - Below Water - 6A	Selected Granular Fill - Starter Layer - 6B	Selected Granular Fill - Starter Layer - 6C	Selected Granular Fill - Capping - 6F3	Selected Granular Fill - Capping - Fine - 6F4	Selected Granular Fill - Capping - Coarse - 6F5	Sub Base - Type 1	Sub Base - Type 2	Sub Base - Type 3	Sub Base - Category B	Sub Base - Type 4
BOS Slag	X	X	X	X	X	X	X		X	X	X	X					X	X		X	X	X	X	X	X	X
Blast Furnace Slag	X	X	X	X	X	X	X	X	X	X	X	X					X	X		X	X	X	X	X	X	X
Recycled Aggregate	X	X	X	X	X	X	X	X	X	X	X	X	X			X	X	X	X	X	X	X	X	X	X	X
Soil														X	X											

As part of the FPC, each aggregate will be tested at regular intervals based on production throughput for compliance with the relevant Standard and Specification

5.2: Aggregate Production

Mobile screens or crushers are tracked to the stockpiles which require processing within each working area A working platform is constructed from the unprocessed material for an excavator to sit in so it can reach the unprocessed stock and feed the screen. The excavator will then pick up the unprocessed material with the bucket and feed the material through a 'live head' which will initially prevent any material with a greater size of 175mm from passing through. This oversize is removed by loading shovel and placed into stock, waiting further processing, if necessary.

Material passing through the live head will pass underneath a magnetic belt running perpendicular to the feed belt and will remove all scrap metals to the side of the screen where they will be subsequently moved by the front-loading shovel to stock. Once passed the magnetic belt, the material will filter through a series of different sized mesh plates separating the materials to desired size grades. The mesh plates can be changed to give different grade materials.

Once the material passes through the mesh plates to desired size, belts carry the materials in different directions dropping the material to the ground for the front-loading shovel to move into the appropriate product stockpiles.

The stockpiles of finished products will be regularly visually inspected at least once a week to record any stability or deterioration of the stockpile.

5.3: Contamination of Screened Materials

Contamination of materials is declared if **any** stockpile whether it is processed or unprocessed is mixed with any other materials of different type, size or state of process without the intent of the Site Supervisor or Site manager. In the event of contamination of stockpiles the following must be carried out:

- Report the incident to Site Supervisor and Site Manager.
- Record the incident in the Site Non-Conformity Log.
- Isolate the material until treatment can be carried out.
- Investigate to determine the cause of contamination.

Investigation into the contamination must reveal the type of contamination and how the material was contaminated. For contamination resulting from DLS personnel on site the Site Supervisor or Site Manager must inform the personnel on site of the error and correct the situation. For contamination resulting from hauliers the site manager is to be informed and must stop all hauliers and inform them they must see the Site Supervisor to be shown where to tip. Repeat offences of contaminating stockpiles are to be reported to DLS Management for the necessary action to be taken.

5.4: Recording Production

All materials processed must be recorded by the Front Loading Shovel Operator in a manner that can be easily read and interpreted by the Site Manager, Administrators and the regulatory body. It is the Responsibility of the Front Loading Shovel Operator to correctly and accurately account for the materials produced and recorded by them in the correct manner. It is the responsibility of the Machine Operator to raise any queries or issues about the production with the Site Supervisor. It is also the responsibility of the Front Loading Shovel Operator to ensure the following points are covered for both types of Production and for the Site Supervisor to instruct to new Operators to the site:

- **All** grades of material which are produced **must be** recorded on a DLS Production Record (See DLS-MP-60-F01).
- Only finished products are to be recorded on the Production sheet. Materials which require further processing within the production method are not to be recorded on the production sheet.
- Only loading shovels with calibrated weigh loaders are to be used for recording production.
- **All** sections of the production sheets are to be filled out correctly and accurately.
- The total weight for the day for each material grade is to be recorded in the appropriate box. Each product must be recorded separately on the production sheet, clearly indicating the material grade.
- Date of screening/crushing and the Shovel Operator's name are to be recorded on the production sheets.
- All production sheets **must be** handed in to the Site Manager at the end of the day.
- Different Produced materials (I.E Slag based products/ Rubble based Products) materials production must be recorded on separate Production Sheets.
- Any production defects (oversize or undersize materials) observed within the production process are to be recorded on the production sheets next to the relevant product grade.

Review of Production Tonnages

Each morning the Site Manager is to review the previous days data from the Production Logs. Any discrepancies or anomalies that are observed by the Site Manager are to be addressed immediately and the correct or missing information entered / submitted to the site manager before the end of that day.

5.5: Digital Recording & Reporting Production

All processed material must be recorded on a weekly basis. All production activities are to be reported to the Site Manager. All recorded production tonnages must be submitted to the Site Manager. It is the responsibility of the Shovel Operators & Site Supervisor to ensure all Production Tonnages are submitted, and the responsibility of the Site Manager to ensure that all Production Tonnages are recorded, stored and reported correctly.

All materials processed on site are to be digitally recorded in a clear and appropriate manner, given a breakdown of productions by:

- Date
- Material Type
- Process Type
- Material Grade
- Stockpile number (If appropriate)

6.0: Product Storage, Sampling, Testing and Evaluation

In accordance with the quality protocols and current legislation to achieve end of waste, a testing protocol must be established to ensure that the end product is fit for use within the market. This section details the storage, sampling, testing and evaluation procedures for each of the waste/products highlighted in Figure 04.

6.1: Product Storage

All produce stockpiles are to be kept separate with clear distinctions between other stockpiles. Each pile is to be clearly labelled with the source material name and grading.

The stockpiles of finished products will be regularly visually inspected at least once a week to record any stability or deterioration of the stockpile. This will be recorded as part of the Site Supervisor/Managers daily inspection on DLS-MP-60-F02.

6.2: Product Sampling

Proper and careful sampling and sample transport is a prerequisite for an analysis that will give reliable results. Sampling will be undertaken in accordance with BS 932-1.

Sampling variation caused by the heterogeneity of the batch is reduced to an acceptable level by taking an adequate number of sampling increments. If the product is homogenized by production processes, one large increment may be representative of the batch.

Sampling increments will be taken from different heights or depths from the stockpile over the complete stockpile. Typically, 5 increments are to be taken from the base of the stockpile, and 2 from the mid-section. The sample shall be retrieved from inside the stockpile and not from the surface.

The sample increments will be combined at the production week end to form one bulk sample. The sample bag(s) forming the bulk sample should weigh no more than approximately 25kg unless otherwise specified by the laboratory / testing protocol.

This approach will also be used for previously homogenised stockpiles.

The samples or containers shall be clearly and durably marked. Marking shall include:

a) A unique ID code, or
b) Identification of the laboratory samples, place of sampling, date of sampling, and designation of the material.

The unique ID code will be given to the sample to trace back to the stockpile.

The laboratory samples shall be packed and transported in such a way that their condition at the time of sampling is preserved e.g. fines cannot be lost during transportation.

The sampler shall prepare a sampling report for each laboratory sample or for each group of laboratory samples from a single source. The sampling report shall refer to this European Standard and state:

a) the date and place of sampling;
b) the grading type and size of the batch;
c) sampling point or identification of the batch sampled;
d) the name of sampler(s).

6.3: Product Testing and Evaluation

Figure 05 in Appendix 1 details the products produced within the operation and specifies the testing protocols for each type of product.

6.3.1: Aggregate Products

Initial type testing is a suite of tests carried out on the aggregate that are relevant to its intended use, before it is first placed on the market. Additional testing may be required to satisfy specific customer requirements. This needs to be agreed with the customer prior to the processing of the material.

This testing is aimed at characterising the aggregate and will be undertaken before the aggregate is placed on the market and then once every 3 years.

Aggregate testing is a fundamental requirement of the FPC. The schedule of test work summarised in Appendix 1 will form the basis of the sampling programme. The testing procedures, using the reference test methods, have the function of providing assurance that a particular aggregate product complies with each of the selected specified requirements in the product standard.

For aggregates, at least 90 % of grading's, taken on different batches within a maximum period of 6 months, shall fall within the limits specified in the corresponding documents specification documents listed in Appendix 1.

Size designations and grading categories are essentially categories of convenience and different sizes and grading categories may be used by agreement between supplier and purchaser.

5.3.2: Ferrous and Non-Ferrous Products

Metals produced through the metal recovery operations (magnets), will be stockpiled in to size category (aluminium, light scrap, A Skull, C Skull etc) and sold as scrap metals to interested buyers. Size gradings and metallic content will be specified by the buyer and any quality protocols will be determined by the buyer.

5.3.3: Other Wastes

Any other waste generated within or as a result of the process (e.g. small quantities of wood, plastic, etc) will be stored in appropriate containers and sent off-site as a waste product to a licenced facility and controlled under waste regulations.

6.4: Non Conformities

Products that are shown to be non-compliant as a result of failed testing, or due to a complaint received regarding the product will either be;

a) Reprocessed where possible
b) Used for another end use for which it is suitable
c) Rejected and placed in a clearly identified area before being taken off-site to another Permitted facility for either recovery or disposal

Details on the non-conforming products and remedial actions shall be recorded. The product non-conformity will be recorded on the Product Non-conformance log.

6.5: Corrective Actions

Where non-conformance is identified, DLS will investigate to identify and eliminate the cause of further nonconformities.

Corrective actions will include:

1) Investigation of the cause of non-conformity including an examination of the testing procedure and making any necessary adjustments;
2) Analysis of processes, operations, quality records, service reports and customer complaints to detect and eliminate potential causes of non-conformity;
3) Initiating preventive actions to deal with problems to a level corresponding to the risks encountered;
4) Applying controls to ensure that effective corrective actions are taken;
5) Implementing and recording changes in procedures resulting from corrective action.

7.0: Despatch of Products.

All materials leaving the processing areas must be accounted for, and accurate records must be kept on file. The crucial part of the despatch process is to ascertain the use of the material, so that the correct material can be allocated.

7.1: Material Requests.

There will be two distinct type of despatch requests. Internal for use on site by Tata and external for sale on the open market.

7.1.1: Internal Material Use.

All internal requests will be authorised by the Site Manger and only produced products will be used. The amounts of product used will be recorded and documented for review

7.1.2: External Customer Requests.

All external requests for products must be in a written format and submitted to the DLS Site Manager.

7.2: Product Conformance

The products manufactured at the site will be stored and handled in a controlled manner. Care will be taken to avoid cross contamination with other products and input materials.

There is no mandatory requirement to CE mark aggregate products in the UK. CE marking will be required for aggregates supplied to or within other EU Member States where CE marking is required.

Each batch supplied to a customer will however be issued with a Product Despatch note that details product conformance and as a minimum contains.

- unique serial number
- name and details of the aggregate product, including any customer specification
- producer's name, address and contact details
- European Standard Identified e.g. BS EN 13242:2013 for pipe bedding and BS EN 13285:2018 for unbound mixtures such as general fill capping
- aggregate source code (A1 reclaimed asphalt, A2 for crushed concrete, A3 for crushed bricks, A4 for mix of A1, A2 and A3, D3 for steel slag)
- statement of conformity that the aggregate was produced in accordance with relevant quality protocol for either inert waste or steel slag
- date of product dispatch
- quantity by volume or weight
- any identifying batch or serial number
- results of any product tests

Unless otherwise specified by the customer the products will conform to the specification set out in section 5.1 Any specific request by the customer for product quality must be made in writing and sent to the DLS Management prior to any material being produced for the order, and agreed by all parties (DLS/Customer).

7.3: Despatch of Materials Procedure.

1. The driver will wait until the Site Manger can check their request information.
2. The Site Manager will confirm the material requested and the Order Number for the despatch and issue a material authorisation ticket.
3. The driver will be given instructions by the site manager (and if required a site map) for where they need to go onsite to be loaded.
4. The Driver will receive a tare weight from the weighbridge
5. The driver will proceed to the designated loading point.

6. The driver will wait at the designated point to be called by the loading shovel operator.
7. The driver will hand over the authorising ticket to the loading shovel operator to be escorted to the correct product stock pile and proceed to be loaded.
8. The loading shovel operator will indicate to the hauler that the loading is complete and that it is safe to leave the area.
9. The driver will return to the weighbridge to receive are gross and nett weight.
10. The driver will be issues a dispatch note confirming the product details
11. The hauler will leave the site once the haulage vehicle is sheeted and wheels washed, where necessary.

Section 8.0: Calibrations

To ensure compliance with both client and regulatory requirements, equipment used for measurements essential to the operation are required to be calibrated. This section ensures an effective system exists for ensuring that all inspection, measuring & test equipment (IMTE) is identified and serviced/calibrated on a regular basis, thus ensuring that the equipment is operating to the correct parameters.

Each item of IMTE deemed critical to the customer or DLS will be identified with a unique serial number or DLS asset number. This information must be entered on to a calibration register that lists all similar equipment.

8.1: Weighbridge

Where a site weighbridge is used to record the weights, it must be calibrated for trading use. DLS will check and monitor the calibration date, and arrange for the service and calibrations to be carried. Copies of the Weighbridge calibration are to be kept at the weighbridge for auditing purposes and all frequencies and records of calibrations will be kept at the maintenance department and recorded on the DLS Calibration Register.

8.2: Weigh Loaders

Weigh loaders are utilised to record materials produced by the manufacturing process. The weigh loaders will weigh and record the 'tonnage' produced as the materials is moved from the production pile to the stock pile. All frequencies and records of calibrations will be kept at the maintenance department and recorded on the DLS Calibration Register.

Appendix 1: Product Specifications

Figure 05: Product Specifications – General Specifications Section 1

Test	Standard	Sieve Size	Qty	Weight / Kg	Frequency 1 Per	Product Produced											
						SHW 500 Pipe Bedding - Coarse - Graded	SHW 500 Pipe Bedding - Coarse - Single Size	SHW 500 Pipe Bedding - Fine	SHW 500 Pipe Bedding - All In	SHW 500 Filter / Drain Material	SHW 600 General Granular Fill - Well Graded - 1A	SHW 600 General Granular Fill - Uniformly Graded - 1B	SHW 600 General Granular Fill - Coarse Granular - 1C	SHW 600 General Granular Fill - Wet cohesive material - 2A	SHW 600 General Granular Fill - Dry cohesive material - 2B	SHW 600 General Granular Fill - Stony cohesive material - 2C	SHW 600 General Granular Fill - Silty cohesive material - 2D	SHW 600 Landscaping Fill - Fill for Landscaping - 4
PSD	EN1097-5	Each Grade	1	10	Week	See Spec	See Spec	See Spec	See Spec	See Spec	See Spec	See Spec	See Spec	See Spec	See Spec	See Spec	See Spec	See Spec
Moisture Content	EN1377-2										User Spec	User Spec		>= -4%PL	<= -4%PL	User Spec	User Spec	User Spec
Uniformity Cooefficent	EN1377-2										>=10	<=10	>=5					
Maximum fines & Oversie catagories	EN1377-2					See Spec	See Spec	See Spec	See Spec	See Spec								
Los Angeles Abrasion	EN 1097-2	14mm - 10mm	1	15	6 Months	<=50	<=50	<=50	<=50	<=50			<=50					
Water Soluble Sulfate Content	EN1744-1 C10	<25mm	1	5	Month	<=0.2% (SS0.2)	<=0.2% (SS0.2)	<=0.2% (SS0.2)	<=0.2% (SS0.2)	<=0.2% (SS0.2)								
Constituents Testing	EN 933-11	Representative	1	10	Monthly	X <= 1%	X <= 1%	X <= 1%	X <= 1%	X <= 1%	X <= 1% Ra <= 50% RG <=25%	X <= 1% Ra <= 50% RG <=25%	X <= 1% Ra <= 50% RG <=25%	X <= 1% Ra <= 50% RG <=25%	X <= 1% Ra <= 50% RG <=25%	X <= 1% Ra <= 50% RG <=25%	X <= 1% Ra <= 50% RG <=25%	X <= 1% Ra <= 50% RG <=25%
Water Soluble Sulfate Content within 500mm of concrete, cement etc = Top result Within 500mm of metalic structures = bottom result	EN1744-1 C10	<25mm	2	20	Month	<=1,500mg <=300mg	<=1,500mg <=300mg	<=1,500mg <=300mg	<=1,500mg <=300mg	<=1,500mg <=300mg	<=1,500mg <=300mg	<=1,500mg <=300mg	<=1,500mg <=300mg	<=1,500mg <=300mg	<=1,500mg <=300mg	<=1,500mg <=300mg	<=1,500mg <=300mg	<=1,500mg <=300mg
Total Sulfur	EN1744-1	<25mm			Month	<=2% (BFS) <=1% (Other)	<=2% (BFS) <=1% (Other)	<=2% (BFS) <=1% (Other)	<=2% (BFS) <=1% (Other)	<=2% (BFS) <=1% (Other)	<=2% (BFS) <=1% (Other)	<=2% (BFS) <=1% (Other)	<=2% (BFS) <=1% (Other)	<=2% (BFS) <=1% (Other)	<=2% (BFS) <=1% (Other)	<=2% (BFS) <=1% (Other)	<=2% (BFS) <=1% (Other)	<=2% (BFS) <=1% (Other)
Sulphide within 500mm of concrete, cement etc = Top result Within 500mm of metalic structures = bottom result	EN1744-1 C13	Representative	1	1	Month	<=0.5% <=0.06%	<=0.5% <=0.06%	<=0.5% <=0.06%	<=0.5% <=0.06%	<=0.5% <=0.06%	<=0.5% <=0.06%	<=0.5% <=0.06%	<=0.5% <=0.06%	<=0.5% <=0.06%	<=0.5% <=0.06%	<=0.5% <=0.06%	<=0.5% <=0.06%	<=0.5% <=0.06%
pH	BS 1377-3	Representative	1	1	Month													
Frost Heave (Wet) If material is within 450mm of final surface = top result If material is within 350mm of final surface, Annual Frost Index must be less than bottom result	BS812-P124	35mm	1	60	Year						<=15mm <=50	<=15mm <=50	<=15mm <=50	<=15mm <=50	<=15mm <=50	<=15mm <=50	<=15mm <=50	<=15mm <=50
Moisture Condition Value (MVC)	EN1377-4	<20mm	1	5	Weekly						User Spec	User Spec		User Spec	User Spec	User Spec	User Spec	User Spec
Undrained Shear Strength	EN1377-7		1	5	Weekly									User Spec	User Spec	User Spec	User Spec	
Magnesium Sulphate Soundness	EN1376-2	14mm - 10mm	1	20	Year													
Volume Stability (BOS Refuse)	EN1744-1	25mm+	1	20	6 Months													
Volume Stability (BFS)	EN 1744-1	25mm+	1		6 Months													
Dicalcium Silicate Disintegration (BFS)	EN 1744-1		1		6 Months													
Plastic index / Limit (PL)	EN1377-2	<10mm	1	5	Weekly									State	State	State		
Dry Density / Particle Density / OMC	EN1377-4	<20mm	1	20	Year													
Resistance to Wear - micro-Deval	EN 1097-1	14mm - 10mm	1	2	Year													
Particle Density & Water Absorption	BS EN 1097-6	<25mm	1	5	Year													

Figure 06: Product Specifications – General Specifications Section 2

Test	Standard	Sieve Size	Qty	Weight / Kg	Frequency 1 Per	Produced product												
						SHW 600 Top Soil - 5A	SHW 600 Top Soil - 5B	SHW 600 Selected Granular Fill - Below Water - 6A	SHW 600 Selected Granular Fill - Starter Layer - 6B	SHW 600 Selected Granular Fill - Starter Layer - 6C	SHW 600 Selected Granular Fill - Capping - 6F3	SHW 600 Selected Granular Fill - Capping - Fine - 6F4	SHW 600 Selected Granular Fill - Capping - Coarse - 6F5	SHW 800 Sub Base - Type 1	SHW 800 Sub Base - Type 2	SHW 800 Sub Base - Type 3	SHW 800 Sub Base - Category B	SHW 800 Sub Base - Type 4
PSD	EN1097-5	Each Grade	1	10	Week	See Spec	See Spec	See Spec	See Spec	See Spec	See Spec	See Spec	See Spec	See Spec	See Spec	See Spec	See Spec	See Spec
Moisture Content	EN1377-2								User Spec	User Spec	<=OMC >= -2%OMC	<=OMC >= -2%OMC	<=OMC >= -2%OMC					
Uniformity Cooefficent	EN1377-2							>=10		<=10								
Maximum fines & Oversie catagories	EN1377-2											UF15 & OC75	UF15 & OC75	UF9/12 & OC75	UF9 & OC75	UF5 & OC80	UF9 & OC80	UF9 & OC75
Los Angeles Abrasion	EN 1097-2	14mm - 10mm	1	15	6 Months				<=50	<=50		<=60	<=50	<=50	<=50	<=30	<=30	<=50
Water Soluble Sulfate Content	EN1744-1 C10	<25mm	1	5	Month													
Constituents Testing	EN 933-11	Representative	1	10	Monthly	X <= 1% Ra <= 50% RG <=25%	X <= 1% Ra <= 50% RG <=25%	X <= 1% Ra <= 50% RG <=25%	X <= 1% Ra <= 50% RG <=25%	X <= 1% Ra <= 50% RG <=25%	X <= 1% Ra <= 50% RG <=25%	X <= 1% Ra <= 50% RG <=25%	X <= 1% Ra <= 50% RG <=25%	X <= 1% Ra <= 50% RG <=25%	X <= 1% Ra <= 50% RG <=25%	X <= 1% Ra <= 50% RG <=25%	X <= 1% Ra <= 50% RG <=25%	X <= 1% Ra <= 50% RG <=25%
Water Soluble Sulfate Content within 500mm of concrete, cement etc = Top result Within 500mm of metalic structures = bottom result	EN1744-1 C10	<25mm	2	20	Month	<=1,500mg <=300mg	<=1,500mg <=300mg	<=1,500mg <=300mg	<=1,500mg <=300mg	<=1,500mg <=300mg	<=1,500mg <=300mg	<=1,500mg <=300mg	<=1,500mg <=300mg	<=1,500mg <=300mg	<=1,500mg <=300mg	<=1,500mg <=300mg	<=1,500mg <=300mg	<=1,500mg <=300mg
Total Sulfur	EN1744-1	<25mm			Month	<=2% (BFS) <=1% (Other)	<=2% (BFS) <=1% (Other)	<=2% (BFS) <=1% (Other)	<=2% (BFS) <=1% (Other)	<=2% (BFS) <=1% (Other)	<=2% (BFS) <=1% (Other)	<=2% (BFS) <=1% (Other)	<=2% (BFS) <=1% (Other)	<=2% (BFS) <=1% (Other)	<=2% (BFS) <=1% (Other)	<=2% (BFS) <=1% (Other)	<=2% (BFS) <=1% (Other)	<=2% (BFS) <=1% (Other)
Sulphide within 500mm of concrete, cement etc = Top result Within 500mm of metalic structures = bottom result	EN1744-1 C13	Representative	1	1	Month	<=0.5% <=0.06%	<=0.5% <=0.06%	<=0.5% <=0.06%	<=0.5% <=0.06%	<=0.5% <=0.06%	<=0.5% <=0.06%	<=0.5% <=0.06%	<=0.5% <=0.06%	<=0.5% <=0.06%	<=0.5% <=0.06%	<=0.5% <=0.06%	<=0.5% <=0.06%	<=0.5% <=0.06%
pH	BS 1377-3	Representative	1	1	Month									State	State	State	State	State
Frost Heave (Wet) If material is within 450mm of final surface = top result If material is within 350mm of final surface, Annual Frost Index must be less than bottom result	BS812-P124	35mm	1	60	Year	<=15mm <=50	<=15mm <=50	<=15mm <=50	<=15mm <=50	<=15mm <=50	<=15mm <=50	<=15mm <=50	<=15mm <=50	<=15mm <=50	<=15mm <=50	<=15mm <=50	<=15mm <=50	<=15mm <=50
Moisture Condition Value (MVC)	EN1377-4	<20mm	1	5	Weekly													
Undrained Shear Strength	EN1377-7		1	5	Weekly													
Magnesium Sulphate Soundness	EN1376-2	14mm - 10mm	1	20	Year									MS35	MS35	MS35	MS35	MS35
Volume Stability (BOS Refuse)	EN1744-1	25mm+	1	20	6 Months							V5	V5	V5	V5			V5
Volume Stability (BFS)	EN 1744-1	25mm+	1		6 Months							0	0	0	0	0	0	0
Dicalcium Silicate Disintegration (BFS)	EN 1744-1		1		6 Months							0	0	0	0	0	0	0
Plastic index / Limit (PL)	EN1377-2	<10mm	1	5	Weekly			Non Plastic	Non Plastic	Non Plastic								
Dry Density / Particle Density / OMC	EN1377-4	<20mm	1	20	Year						State	State	State					
Resistance to Wear - micro-Deval	EN 1097-1	14mm - 10mm	1	2	Year									State	State	State	State	State
Particle Density & Water Absorption	BS EN 1097-6	<25mm	1	5	Year									State	State	State	State	State

Figure 07: Product Specifications – Series 500 Grading Specifications

SHW Series 500 - Pipe Bedding - Particle Size Requirements																											
Bedding Type	Material Type	Pipe Size	Aggregate Size	Top Size	Bottom Size	$G_C(D/d)$	%<D	%>d	EN 933-1																		
									f	500	300	125	80	63	40	31.5	20	16	10	8	6.3	4	2	1	0.5	0.25	0.125	0.063
Coarse	Graded	>400mm Pipe	2/14	14	2	G_C80-20	80	20	4									80					20					
Coarse	Graded	>400mm Pipe	4/20	20	4	G_C80-20	80	20	4								80					20					
Coarse	Graded	>400mm Pipe	4/40	40	4	G_C80-20	80	20	4						80							20					
Coarse	Graded	400mm - 140mm Pipe	2/14	14	2	G_C80-20	80	20	4									80					20				
Coarse	Graded	400mm - 140mm Pipe	4/20	20	4	G_C80-20	80	20	4								80					20					
Coarse	Single Size	>400mm Pipe	4/10	10	4	G_C80-20	80	20	4										80		20						
Coarse	Single Size	>400mm Pipe	6/14	14	6	G_C80-20	80	20	4									80			20						
Coarse	Single Size	>400mm Pipe	10/20	20	10	G_C80-20	80	20	4								80		20								
Coarse	Single Size	>400mm Pipe	20/40	40	20	G_C80-20	80	20	4						80		20										
Coarse	Single Size	400mm - 140mm Pipe	4/10	10	4	G_C80-20	80	20	4										80			20					
Coarse	Single Size	400mm - 140mm Pipe	6/10	10	6	G_C80-20	80	20	4										80		20						
Coarse	Single Size	400mm - 140mm Pipe	10/20	20	10	G_C80-20	80	20	4								80		20								
Coarse	Single Size	<140mm Pipe	4/10	10	4	G_C80-20	80	20	4										80			20					
Fine & All In	Fine	All	0/1	1	0	G_C80-20	80	20	11															80			
Fine & All In	Fine	All	0/2	2	0	G_C80-20	80	20	11														80				
Fine & All In	Fine	All	0/4	4	0	G_C80-20	80	20	11													80					
Fine & All In	Fine	All	0/6	6	0	G_C80-20	80	20	11												80						
Fine & All In	All in	<140mm Pipe	0/10	10	0	G_C80-20	80	20	11										80								
Fine & All In	All in	400mm - 140mm Pipe	0/10	10	0	G_C80-20	80	20	11										80								
Fine & All In	All in	400mm - 140mm Pipe	0/20	20	0	G_C80-20	80	20	11									80									
Fine & All In	All in	>400mm Pipe	0/10	10	0	G_C80-20	80	20	11										80								
Fine & All In	All in	>400mm Pipe	0/20	20	0	G_C80-20	80	20	11									80									
Fine & All In	All in	>400mm Pipe	0/40	40	0	G_C80-20	80	20	11						80												

SHW Series 500 - Filter Drains - Particle Size Requirements																
Aggregate Size	Top Size	Bottom Size	$G_C(D/d)$	%<D	%>d	EN 933-1										
						f		80	63	40	20	10	4	2	0.5	0.125	0.063
20/40	40	20	G_C80-20	80	20	NR	Lower		100	99	20	5					
							Upper	100	98	80	0	0					

Figure 08: Product Specifications – Series 600 Grading Specifications

Type	Code	Description	SHW Series 600 Grading BS EN 1377 Part 2																	
			500	300	125	90	75	37.5	28	20	14	10	6.3	5	3.35	2	1.18	0.6	0.3	0.15	0.063	0.002
General Granular Fill	1A	Well Graded		100	95-100																<15	
	1B	Uniformly Graded			100																<15	
	1C	Coarse Granular	100		10-95													0-25			15	
	2A	Wet Cohesive Material			100											80-100					15-100	
	2B	Dry Cohesive Material			100											80-100					15-100	
	2C	Stony Cohesive Material			100											15-80					15-80	
	2D	Silty Cohesive Material			100																80-100	0-20
Top Soil	5B	Imported	BS 3882																			
Selected Granular Fill	6A	Below Water	100									0-100		0-85				0-45			0-5	
	6B	Starter Layer	100		0-10																	
	6C	Starter Layer			100			0-100					0-100		0-35	0-10		0-2				

Type	Code	Description	SHW Series 600 - Grading BS EN 933-2 (Imported)																	
			500	300	125	80	63	40	31.5	20	16	10	8	6.3	4	2	1	0.5	0.25	0.125	0.063
Selected Granular Fill	6F3	Below Water			100	75-99		50-90		30-75		15-60				0-35					0-12
	6F4	Starter Layer					100		75-99		50-90		30-75		15-60		0-35				<15
	6F5	Starter Layer			100	75-99		50-90		30-75		15-60				0-35					0-12

Figure 09: Product Specifications – Series 800 Grading Specifications

SHW Series 800 - Type 1 & Type 4								
	63	31.5	16	8	4	2	1	0.063
Grading	100	75-99	43-81	23-66	12-53	6-42	3-32	0-9
SDVGR			54-72	33-52	21-38	14-27	9-20	
Tolerance + or -			15	15	15	13	10	

Retained Sieve size	Passing sieve size	Min	Max
8	16	7	30
4	8	7	30

SHW Series 800 - Type 2								
	63	31.5	16	8	4	2	1	0.063
Grading	100	75-99	50-90	30-75	15-60		0-35	0-9
SDVGR								
Tolerance + or -								

Retained Sieve size	Passing sieve size	Min	Max
8	16	5	35
4	8	5	35

SHW Series 800 - Type 3									
	80	40	20	10	4	2	1	0.5	0.063
Grading	100	80-99	50-78	31-60	18-46	10-35	6-26	0-20	0-5
SDVGR			58-70	39-51	26-38	17-28	11-21	5-15	
Tolerance + or -			8	8	8	8	8	8	

Retained Sieve size	Passing sieve size	Min	Max
10	20	10	25
4	10	10	25
2	4	7	20
1	2	4	15

SHW Series 800 - Category B									
	63	31.5	16	8	4	2	1	0.5	0.063
Grading	100	80-99	55-85	35-68	22-60	16-47	9-40	5-35	0-9
SDVGR			63-77	43-60	30-52	23-40	14-35	10-30	
Tolerance + or -			8	8	8	7	5	5	

Retained Sieve size	Passing sieve size	Min	Max
8	16	10	25
4	8	10	25
2	4	7	20
1	2	4	15

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