27th January 2015

EPR Permit Ref: BS3905IP. Tata Steel Strip Products UK, Llanwern Works

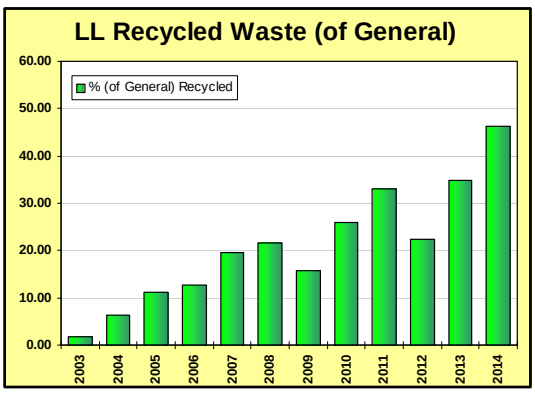
Re: PPC Permit Condition 9.7 – "The Operator shall conduct a waste minimisation audit that analyses the use of raw materials, assess the opportunities for the reduction in generation of wastes and provides an action plan for achieving the identified improvements. The review shall assess the current disposal techniques to ensure that the disposal of wastes meets the requirements of the Landfill Directive. A report shall be provided to the Agency. Timescales shall be agreed with the Agency (Natural Resources Wales)."

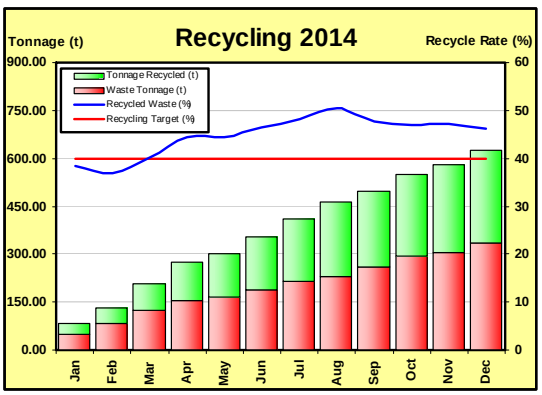
Introduction

The following report briefly summarizes: i) waste performance over the previous year, and details some of the main waste management activities ii) raw materials vs production measures, and iii) an overview of some of the process waste types, and associated disposal arrangements and opportunities

[1] Site Waste Management

One of the main changes since previous waste submissions, has been the introduction of a new site waste management contract. This has been implemented, and overseen by a site waste management group, with a focus on waste minimization, and optimising of segregation practices. The consequences of such enhancements are increased options for the optimum recycling / disposal routes, this being in-line with the established waste management hierarchy. Despite only being introduced some way through the 2014 period, one of the main KPI measures of recycling i.e. % of material, which would otherwise have gone into general (landfill) waste, has indicated an annual performance of 46.3%, in excess of the 40% target. This continues a further year on year trend in improvement against this measure. The progress can be seen as a graphical representation below:





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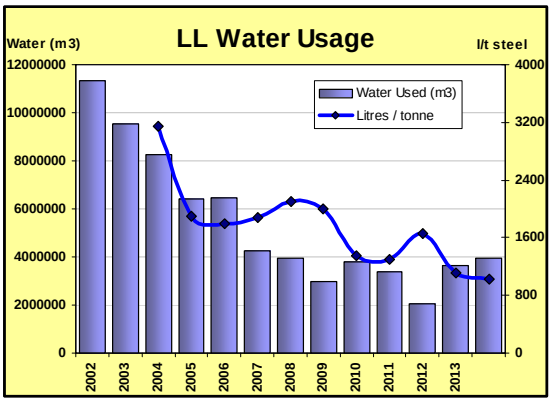
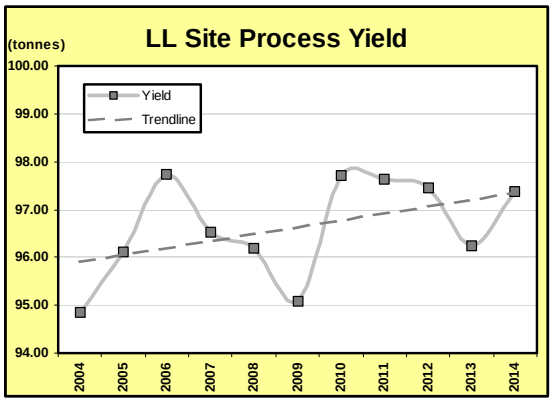
The performance in this regard will further improve going forward, as a route for general waste has been agreed, which will divert a significant proportion of this waste stream from landfill, to an energy recovery process – this being in-line with a high level company objective to eliminate waste from landfill. This change will likely necessitate the defining of a revised KPI (Key Performance Indicator), and associated targets, in order to: better reflect waste management performance, and to enable focus on where improvements can be made in subsequent years

[1] Raw Materials

For an indication of raw materials usage & performance, the graphs in this section show each of the main raw materials (acid, oil, steel, water, zinc) expressed in a 'unit / tonne' format, for a year on year comparison of usage efficiency. This serves to give a good broad overview of performance in relation to each parameter

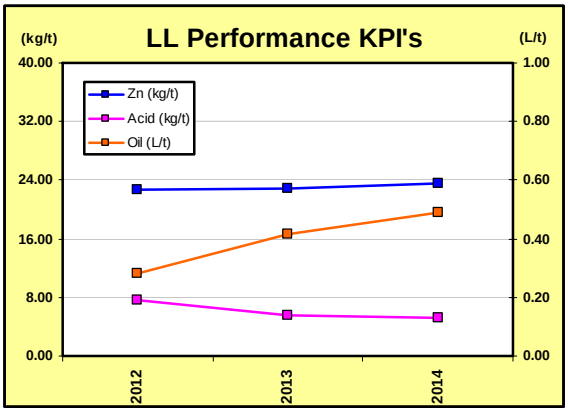




In relation to the above water graph, there is a clear downward trend for water usage per tonne of product. Some of the contributory factors for this are: an improvement in the distribution system integrity, in conjunction with effective leak detection, and process arrangements e.g. minimizing stop start of certain processes, and use of closed loop systems. This is also against a backdrop of increased 'flushing' of system, for the purpose of helping prevent bacterial growth (such as legionella) in various process & domestic water systems

With regards to yield, the graph depicts overall site production yield, calculated from scrap arisings Vs production tonnage. Whilst there are many factors that can affect yield performance, there is nevertheless an observable trending improvement in this broad performance measure. Specifics aside, there is appreciable site focus on yield performance due to cost implications, and from an environmental perspective, this also means less energy & material usage in the up-stream processes

Comprehensive data for the following performance graph has only been available for a limited number of years, and as such the dataset has yet to fully develop to a point whereby it can supply usable trend information. It is however included here for information purposes, and to supply a base level with which to observe future efficiencies. As with some of the other parameters, these performance indicators can be influenced by a variety of factors, not least of all: variable production tonnages, product specification etc. with various units sometimes only operating in accordance with product demand, and raw material (steel slab) supply. That aside, it is still considered useful information by which to both: observe trends, and to compare performance with comparable production facilities



[3] Process Waste Streams
This section details the specific process waste streams, and outlines the disposal / recycling route of each

- Liquid Waste Oil [Recycle]
Waste oil arisings come from a number of sources, either directly from processes, or indirectly from oil separators & interceptors. Such arisings undergo a variety of processing, including: gravity separation, chemical & thermal treatment, centrifuge, magnetic separation etc. in order to achieve an oil specification that can be sold to a third party for re-use as lubrication oil following further off-site re-processing

- Hot Mill Scale [Recycle]
This is primarily oxidised iron scale, which forms during the Hot Mill reheating of steel slab. The scale designation also includes small quantities of similar metallic dusts e.g. from de-scaler bag-filter plants, roll grinding processes etc. If the material is of suitable specification, it is suitable for re-cycling back into steelmaking processes

- Hot Mill Sludge & Filter-cake [Recycle]
Almost identical to Hot Mill scale, but containing a quantity of oil rendering it not suitable for re-use into steelmaking processes without further treatment. Therefore depending upon specification & treatment capacity, this material is either dispatched for in-house treatment, or sold to a third party for recycling via alternative means e.g. for use in cement or monolithic products

- Ferrous Chloride Solution [By-Product]
FeCl2 is a by-product of the pickling process, and is formed by the reaction between steel and hydrochloric acid. The solution is collected & stored by a third party, and is subsequently used in the water treatment industry

- Ferrous Hydroxide [Disposal – 3 point test met]
During the Pickling process, the rinse waters used in the final stages of the process are collected & treated by a dedicated effluent treatment plant. The product of this process is a FeOH Ferrous Hydroxide filter cake. Despite it having a high Fe content, the recycling options are limited due to presence of small concentrations of Cl, which negates the option to recycle into steelmaking via the Sinter Plant process. As there are no other viable treatment options, the material is dispatched for Non-Hazardous landfill

- Chromate Waste [Disposal]
Chemical used for the passivation of galvanized steel coil (which include chromic acid), are collected in a waste tank for removal by a specialist Hazardous Waste contractor for off-site treatment & disposal

Zinc Dross [Recycle]
In the Zodiac galvanisation process, Zinc dross is skimmed from the surface of the molten zinc-coating bath, and is then bulked-up into an adequate quantity for dispatch to a metal re-processor based elsewhere in the EU for recycling – Transfrontier Shipment of Waste protocols therefore apply

[4] Improvement Plan
Aside from routine activities which endeavour to achieve improvements in the performance items detailed in this report, the setting of specific project objectives & targets is now integrated into the site ISO14001 management system, and the timeline for such has now been changed from a calendar year to a financial year. This is in order to align with: company strategy & objectives, and site annual planning. Therefore no specifics items are proposed at this stage, until such time as the annual management review session takes place

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