

## SOLID WASTE MATERIAL UTILISATION IN MPM

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### ABSTRACT

*The paper is divided into three parts viz., Sources of generation of solid wastes (both combustible and non-combustible). The existing method of disposal and the future plans of using the solid wastes to the economic advantage of the Mill and pollution reduction. The paper deals in depth about all aspects of solid wastes and the beneficial aspect of using the wastes.*

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This paper deals with certain aspects of the proposed waste material disposal system in M/S Mysore Paper Mills Ltd., Bhadravati and the plans envisaged for improving upon the existing system.

The paper describes the following:

1. Sources generating waste materials and the approximate quantity of waste materials.
2. Existing method of disposal of the wastes.
3. Proposed usage of the waste materials.

1. Sources generating waste materials and the quantity generated

The waste materials can be grouped as combustible wastes and non-combustible wastes. The main areas of waste generation are -

- i) The bamboo dust and wood dust from the chipper complex.
- ii) The effluent sludge from the combined mills effluent treatment plant.
- iii) Flue dust from coal fired boilers and fines in the coal.
- iv) Coal cinders from the coal fired boilers.
- v) Lime sludge from the chemical recovery plant.
- vi) Hypo mud from the hypo plant.
- vii) Pith generation from the Depithing plant.
- viii) Sugar Mill filter sludge.

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### 1.1. Generation of combustible wastes

It is currently expected that the generation of wood dust from the chipper complex is around 6600 T/annum at full level of production.

Also the coal fines which are planned to be removed to make the environment cleaner and the boilers run more efficiently account to about 33000 T/annum (on 5 % of the total coal received).

The effluent sludge from the combined mills effluent treatment plant is removed from vacuum filters. The amount of sludge generated is of the order of 3600 T/annum on dry basis. This contains more than 60 % of them as short fibres and the consistency of the sludge being of the order of 20 %.

The pith generated when the sugar mill bagasse is depithed during the season of  $4\frac{1}{2}$  months is around 32000 T on mill wet basis.

### 1.2. Generation of non-combustible wastes

Non-combustible wastes are generated in the mills causticizing department, hypo plant, coal fired boilers and sugar plant.

#### 1.2.1. The chemical recovery plant having a recovery boiler of 270 T/day solids firing generates larger quantity of lime sludge.

The Causticizing unit is to produce  $750M^3$  of white liquor at 100 gpl active alkali (as  $Na_2O$ ) using lime at 65 % purity. The lime sludge produced per day is around 200 T at 50 % consistency amounting to 60000 T/annum at 50 % consistency.

#### 1.2.2. The amount of Hypo sludge generated in the hypo plant is around $50M^3$ /day at 20 % concentration of mud with a lime quality of 65 % free CaO.

The grits from the causticizing department and hypo plant works out to 10 T/day when the plants run in full swing with 65 % lime.

#### 1.2.3. The Coal fired boilers generate large amount of cinders when the boilers supply 120 T/hr. of steam at $64\text{ Kg/cm}^2$ and $450^\circ\text{C}$

for the mills power generation and process usage. During the sugar season the three boilers together generate 180 T/hr of steam.

The coal cinders are quenched in a submersible conveyor. The amount of coal cinders requiring disposal is of the order of 60000 T/annum on dry basis. The amount of fly ash separated in the mechanical separators is 10000 T/annum on dry basis. The total amount of wastes generated is 70000 T/annum.

1.2.4. The Sugar Mill during the season disposes an amount of 3600 T press mud.

## 2. Existing Method of disposal

### 2.1. Disposal of combustible wastes:

2.1.1. The combustible wastes like wood dust, bamboo dust and effluent sludge are disposed in lorries and also used as a household fuel.

2.1.2. Provision is made to utilise the pith generated from depithing the bagasse in the coal fired boilers to augment steam production and to reduce the consumption of coal by an amount of 14000 T/annum and at the same time avoid atmospheric pollution by light particles of pith.

### 2.2. Disposal of Non-combustible wastes

2.2.1. The non-combustible wastes got from the recovery plant are as present disposed of as a land fill in the area surrounding the mill premises. M/S Visvesvaraya Iron and Steel Ltd., a state owned steel factory near the Paper Mills premises are doing studies on the possible usage of lime sludge in their cement plant. If this study is going to benefit VISL, MPH is automatically benefitted by way of reduction of disposal to the surrounding areas.

#### 2.2.2 Hypo. mud

At present, the hypo mud is stored and allowed to be thickened in large lagoons inside the mill. The dried sludge is periodically lifted and used as a land fill.

### 2.2.3. Coal boilers cinder and fly ash

The large quantity of the fly ash and coal cinders are removed as a land fill. The coal cinders are quenched in submersible ash conveyors and fed to the silo for storing them, from here it is periodically removed in trucks.

## 3. Proposed usage of the wastes

### 3.1.1. Usage of the combustible wastes:

The total materials work out to 38100 T per year, the break-up being 3300 T/year of coal equivalent of wood dust. The effluent sludge of 1800 T/year as coal equivalent and the fines value in the coal of the order of 33000 T/year.

The effluent sludge consists of 80 % of moisture and 20 % organic contents. The dry weight of the organic content also being of the order 3600 T/year. A moisture content of 50 % is expected to be achieved by using a dewatering screw. The dewatered sludge along with the other combustibles is proposed to be converted into pellets in a pelleting plant. These pellets are to be fired in the existing coal fired boilers along with coal. The net coal saving will be of the order of 5100 T/year.

### 3.1.2. Utilisation of Pith

The pith generated from the bagasse depithing plant is to be used in the existing coal fired boilers to augment steam production and thereby saving of coal as mentioned before.

Eventually when the expansion of the sugar mills to 5000 T/day crushing capacity is reached, the additional pith generated along with other wastes is proposed to be fired in a multi fuel fluidised bed boiler proposed. An amount of 32000 T of pith on wet basis will be generated.

The steam from the multifuel fluidised bed boiler (20 T/hr at 44 Kg/cm<sup>2</sup> at 45°C) will be used for additional power generation purposes with a condensing type turbo generator to generate 5 MW of additional power.

3.2. Utilisation of non-combustible wastes:

3.2.1 Utilisation of lime mud from recovery:

It is planned to go in for a rotary kiln to recalcine the lime mud of 200 TPD at 50 % consistency along with some amount of fresh crushed lime stone (including shell quality).

The usage of lime mud in the rotary kiln will help in the reduction of burnt lime requirement from the shaft kiln and from market purchase. Detailed studies are being undertaken on the feasibility of the project.

In conclusion it is to be stated that M/S Mysore Paper Mills Ltd. is making every attempt to reuse the mill waste disposals to economic advantage so that the environment is not polluted.

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