Stephenson

Environmental Management Australia

SHOALHAVEN STARCHES PTY LTD

WASTE MANAGEMENT REPORT

PROJECT NO.: 4023/08

MAY 2008

PREPARED BY : STEPHENSON ENVIRONMENTAL MANAGEMENT AUSTRALIA

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1 INTRODUCTION

1.1 BACKGROUND

Shoalhaven Starched Pty Ltd is a member of the Manildra Group of Companies, which is the largest user of wheat for industrial purposes in Australia. The Manildra Group originated from the NSW Country town of Manildra where a single four mill was purchased in 1952. The Shoalhaven Starches wheat starch and gluten plant at Nowra was originally constructed in 1970. The Manildra Flourmills, in the Central West of NSW, supplies the Shoalhaven Starches Plant. This plant now produces wheat starch, gluten, syrups and ethanol (industrial and fuel grades). The Shoalhaven Starches facility creates direct on-site full-time employment for 195 people and 12 part-time employees. Through the use of local contractors and local industry it also indirectly creates employment for many more.

The factory site is located on the northern side of the Shoalhaven River, south of Bolong Road and approximately 500 metres (m) east of the Bomaderry urban area. The Environmental Farm (approximately 1000 hectares (ha)) is situated to the north of the factory site.

Wastewater generated from the facility originally (up until 1991) was discharged to the Shoalhaven River. Farmland owned by the company is used to beneficially re-use wastewater. To further reduce wastage, Shoalhaven Starches sought to use waste starch for the production of ethanol. Ethanol production began at the Shoalhaven site in 1992.

In 1994, approval was received to install a larger ethanol distillery within the existing site. Other approvals received for the site include a Protein Isolate plant and DDG Dryer, grain grinding plant, construction of wet weather storage pond No. 6.

In 2003, Shoalhaven Starches received approval for the construction of a 220 megalitre (ML) wet weather storage pond and to carry out work to comply with the terms of the Pollution Reduction Program No.7 (PRP7) as detailed in the Company's Environmental Protection Licence issued by the NSW Environment Protection Authority (EPA). The work associated with the PRP7 includes construction of the stillage recovery unit, upgrading the ethanol and glucose plants.

Recently the company received approval to construct and operate a Flour Mill on-site. The company is currently seeking approval to expand production of ethanol on site from 126 million litre per annum to 300 million litre per annum. The expansion includes the installation of a gas fired co-generation plant, water treatment, additional fermenters, dryers, evaporators and associated infrastructure.

1.2 PURPOSE

The purpose of this Waste Management Report is to describe the current waste generated on the site and the current disposal method. Shoalhaven Starches already has an existing Waste Management Standard Operating Procedure in place as part of the company's Quality System.

The proposed expansion will see the current procedure/system amended where appropriate to cope with the additional volume of waste.

Shoalhaven Starches has a Quality System, which contains procedures relating to environmental aspects of the operation. The company is also in the process of developing and implementing an Environmental Management System (EMS) in accordance with the International Standard ISO 14001. Where applicable, cross-referencing to these procedures has occurred within this Waste Management Report.

Note: this report has been prepared based on information sourced from previous environmental reports prepared for the operations in terms of waste and information supplied by Shoalhaven Starches personnel.

1.3 STRUCTURE OF THE REPORT

The report is set out as follows:

- Section 1 - Introduction
- Section 2 – Legal and Regulatory Requirements
- Section 3 – Waste Identification and Classification
- Section 4 – Waste Management

2 LEGAL AND REGULATORY REQUIREMENTS

2.1 NSW LEGISLATION

Waste Avoidance and Resource Recovery (WARR) Act 2001

This Act seeks to encourage the most efficient use of resources and to reduce environmental harm in accordance with the principles of ecologically sustainable development. In addition the Act seeks to ensure that resource management options are considered against the waste hierarchy.

Shoalhaven Starches has taken these principles into account when developing waste management strategies.

2.2 LICENCE FOR THE FACTORY

Shoalhaven Starches has been licensed by the NSW EPA, and now DECC, under the provisions of the *Protection of the Environment Operations Act* 1997. The environment protection licence (No. 883) remains in force for the life of the Facility.

Shoalhaven Starches must continue to comply with the conditions of the EPL.

3 WASTE IDENTIFICATION AND CLASSIFICATION

3.1 TYPES, VOLUMES AND CLASSIFICATION

Table 3-1 summarises the solid waste generated from various areas of the operation, what waste can be generated and the classification in terms of the DECC Guidelines.

TABLE 3-1 SOLID WASTE GENERATED ON SITE

Process Area	Waste Generated
Gluten Plant	Reject waste
Starch Plant	Reject waste
	Damaged and out of spec packed powered product
Gluten and Starch Plants	Dry product spills
Ethanol and Distillation Plants	Wastes from Grain line and fermenters
	Quarantine waste
Coal Fired Boilers	Boiler and fly ash
All areas of the plant and Environmental Farm	Cardboard and paper
	Scrap Metal (Stainless and Black)
	Plastic wrapping and paper bags
	Timber
	Plastic and metal drums
	General rubbish
Environmental Farm	Settled Solids
	Analytical vials

Table 3-2 lists all the types of solid waste generated, which are not reprocessed in the production factory and their associated classification under the NSW EPA *Environmental Guidelines: Assessment, Classification & Management of Liquid and Non-Liquid Wastes (NSW, EPA, 1999).*

TABLE 3-2 WASTE CLASSIFICATION OF MATERIALS TAKEN OFF-SITE FOR DISPOSAL

Type of Waste	Waste Classification
Quarantine waste	Liquid and Non-Liquid Hazardous
Boiler ash	Inert/solid waste
Cardboard and paper products	Non-liquid solid waste
Scrap Metal (Stainless and Black)	Inert/ solid waste
Timber	Inert/ solid waste
Plastic drums and palecons	Inert/ solid waste
Analytical vials	Hazardous – DG Class 8 – UN3264-1830
Settled Solids	Liquid-Group B Food Waste

4 ENVIRONMENTAL MANAGEMENT PLAN

4.1 SOLID WASTE MANAGEMENT

Shoalhaven Starches goal is to minimise the generation of solid waste on site and to handle the waste that is generated in a manner that it will not pollute the environment.

The company's performance objectives and targets are to:

- Avoid, minimise or recycle wherever possible, or responsibly dispose of waste
- To maximise the re-use or recycling of wastes that are generated during construction

Shoalhaven Starches has adopted the Resource Management Hierarchy principles of the WARR Act which are as follows:

- Avoid unnecessary resource consumption as a priority
- Avoidance would be followed by resource recovery (including reuse of materials, reprocessing, recycling and energy recovery) and
- Disposal would be taken as the last resort.

Shoalhaven Starches has a Waste Management System procedure (SA-P-140) already in place. This procedure outlines the waste to which the procedure applies and outlines the procedures of managing and disposing of the wastes generated at the factory site.

SA-P-140 would be up-dated to include the elements of the proposed increase in ethanol production and the associated activities if the development proceeds.

Table 4-1 is a summary of solid wastes already generated on site and how they are managed and disposed of. The table also includes the expected waste volumes to be generated as a result of the production increase. The exact impact on waste volumes will not be known at this point in time, however a 40% increase across the board has been used.

In order to facilitate waste management in the future the following recommendations should be implemented:

- Waste Management Database is established to track volumes of waste being generated.

- Where they don't already exist, the Environmental Manager, or their delegate, develop written agreements with all "waste" disposal companies for those wastes that are taken off-site for re-use, re-processing/ disposal.

The agreement should specify, but not be limited too:

- The name of company
- What material/waste they are taking off-site
- Where material is being transported to
- Disposal method – landfill, re-used, -reprocessed etc
- Pickup interval
- Reporting requirements – e.g. providing Shoalhaven Starches with monthly or quarterly reports on the volume of waste pick up
- Records / licences / permits allowing companies to transport and dispose of the waste

- Maintaining copies of all written agreements

TABLE 4-1 SOLID WASTE MANAGEMENT – WASTES GENERATED

Process Area	Waste generated	Disposal Method	Current Approx Volume Disposed of off-site per week	Proposed Approx Volume Disposed of off-site per week
Gluten Plant	Reject waste	Reassigned or reprocessed within production plant	Not applicable	Not applicable
Starch Plant	Reject waste	Reassigned or reprocessed within production plant	Not applicable	Not applicable
	Damaged and out of spec packed powdered product	Recycled back at the beginning of the process at the Flour Loader	Not applicable	Not applicable
Glucose Plant	Carbon filteraid	Used as an ingredient into DDGs	2 tonnes	2.8 tonnes
Gluten and Starch Plants	Dry product spills	Clean uncontaminated dry product is reprocessed through the factory and slurry is sent to the fermentation plant.	Not applicable	Not applicable
	Damaged bags of starch	Damage bags of starch are reprocessed through fermentation plant or for starch slurry	Not applicable	Not applicable
	Damaged bags of gluten	Damaged bags of gluten are to be reprocessed through the dedicated recycling hopper and recorded on the packing record	Not applicable	Not applicable
	Quarantine waste	Placed in a designated contaminated waste bin. A designated waste company collects the material for ultimate disposal	Not applicable	Not applicable
Coal Fired Boilers	Boiler and fly ash	Primarily taken off site by a licensed commercial composter and landscaper to be used as a horticultural compost ingredient.	50 tonnes	70 tonnes
		Also some of the ash is used by Shoalhaven Starches as a base for roads, for new infrastructure and to be mixed with soil to level depressions in irrigation paddocks on the Environmental Farm	296 tonnes	414 tonnes
All areas of the plant and farm	Cardboard and paper bags	Collected in designated bins and collected by contractor for recycling.	2.25 tonnes	3.15 tonnes

Process Area	Waste generated	Disposal Method	Current Approx Volume Disposed of off-site per week	Proposed Approx Volume Disposed of off-site per week
including main store, office/lab, workshops and packing operation	Metal	Collected in designated bins and routinely recycled by the maintenance crew or sold to a commercial recycler.	6.2 tonnes	8.68 tonnes
	Timber	Taking to local waste management centre to be crushed and prepared for reuse	Included in general waste	Included in general waste
	Empty metal and plastic drums	Sold or gifted to accredited drum recycler	16 drums	6.4 drums
	Plastic Palecons	Issued to DDG Syrup customers	Nil all used	Nil all used
	General rubbish (including plastic wrapping, office paper, timber)	Collected in designated waste bins and taken off-site by local waste contractor on a regular basis for disposal to landfill.	23 tonnes	32 tonnes
	Soil	Stockpiled for transport to Environmental Farm for blending and used in farm levelling work.	No records	No records
Environmental Farm	Settled Solids in Ponds	Sub-surface injection into grazing land as the solids are beneficial as a slow release fertiliser	Not applicable	Not applicable
		Used as a nutrient additive on dry land pasture areas	Not applicable	Not applicable
	Machinery/Scrap metal	Left on the Farm for sale or reuse in the future.	6.16 tonnes	8.6 tonnes
Environmental Farm	Analytical vials	Returned to supplier	6.5 litres per year	9 litres per year

4.2 LIQUID WASTE MANAGEMENT

The company's goal is to minimise the generation of liquid waste on site and to handle the waste that is generated in a manner that it will not pollute the environment.

Shoalhaven Starches performance objectives and targets are to:

- Avoid, minimise or recycle wherever possible or responsibly dispose of waste
- To maximise the re-use or recycling of liquid wastes that are generated
- Ensure irrigation of the wastewater is sustainable

Shoalhaven Starches has adopted the Resource Management Hierarchy principles of the WARR Act which are as follows:

- Avoid unnecessary resource consumption as a priority
- Avoidance would be followed by resource recovery (including reuse of materials, reprocessing, recycling and energy recovery) and
- Disposal would be taken as the last resort.

Shoalhaven Starches has following plan/procedure/document in place to manage liquid waste on the factory site and minimise potential for pollution:

- Surface Water Management Plan
- Cooling water release monitoring – EN-P-0050
- Manildra Group – Shoalhaven Starches – Dangerous Goods. This document contains drawings showing the location, type and volumes of various dangerous and hazardous goods depots around the facility. It also contains the Dangerous Goods Monitoring Plan.

Shoalhaven Starches Environmental Farm personnel use the following Standard Procedures, Work Instructions and plans to operate and manage the farm:

(1) EN-P-0020 – Filling Out and Using the Environmental Farm 24hr Report
(2) EN-P-0090 – Environmental Farm – Pre Irrigation Checks
(3) EN-P-0100 - Irrigation with Pivot Irrigators
(4) EN-P-0110 – Irrigation with Travelling Irrigators
(5) EN-P-0120 – Flushing Irrigation Lines and Pivots
(6) EN-P-0160 – Odour Reduction at Irrigation Start-Up
(7) SA-P-140 – Waste Management System
(8) EN-P-0150 – Acid Protocol for Effluent Storage Ponds.

Table 4-2 summarises the liquid wastes currently generated, current disposal methods and the volumes currently generated. It also includes the proposed current disposal methods and volumes if the ethanol production increase is approved.

TABLE 4-2 LIQUID WASTE MANAGEMENT

Process Area	Waste generated	Current Disposal Method	Proposed Disposal Method	Current Approx Volume Disposed of off-site	Proposed Approx Volume Disposed of off-site
Entire plant operations	Washdown Water	Pumped to the Environmental Farm's storage ponds for disposal via irrigation	Biological wastewater treatment plant and either re-used in the plant, or diverted to the Environmental Farm for Irrigation or discharged to river (if permissible)	1.24 ML per day	2.25 ML per day
	Condensate	Pumped to the Environmental Farm's storage ponds for disposal via irrigation	Biological wastewater treatment plant and either re-used in the plant, or diverted to the Environmental Farm for Irrigation or discharged to river (if permissible)	2.83 ML per day	5.75 ML per day
	Retentate	Not applicable	Biological treatment and disposal via river release, or to Council sewage treatment plant or Environmental Farm (TBC)	Not applicable	1.5 ML per day
	COD reagent	Returned to supplier	Returned to supplier	0.125 L per week	0.2 L per week