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Shoalhaven Starches Pty Ltd

Short Flour Mill Environmental Assessment

Air Quality & Environmental Management Report

April 2007



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1. Introduction

Shoalhaven Starches Pty Ltd, a Manildra Group company, is proposing to construct a Short Flour Mill at their existing Bomaderry plant to manufacture industrial grade wheat flour for use within the starch plant.

1.1 Scope of the Environmental Assessment

GHD was commissioned by Shoalhaven Starches to undertake environmental assessment of the proposed short flour mill for certain issues identified in the draft Director General's Requirements (DGRs). GHD's scope of work addresses:

- » Odour emissions;
- » Particulate matter emissions;
- » Greenhouse gas emissions;
- » A Preliminary Hazard Assessment; and
- » Environmental management and mitigation measures.

The Preliminary Hazard Assessment (PHA) undertaken in accordance with the requirement of SEPP33 *State Environmental Planning Policy No.33 – Hazardous and Offensive Development* (SEPP 33) has been reported in a separate document.

This assessment document provides a consideration of all other issues identified above.

1.2 Description of the Proposal

The proposed facility would produce 5,000 tonnes per week of industrial grade wheat flour. The flour produced by the proposed plant would be combined with an additional 5,000 tonnes per week of flour supplied by rail from Manildra's flour mills at Narrandera, Gunnedah and Manildra. The flour would then be used in the existing Shoalhaven Starch plant to produce starch, gluten, glucose and ethanol. All remaining mill feed/offal would be processed through the Dried Distiller's Grain (DDG) dryers for sale as stock feed.

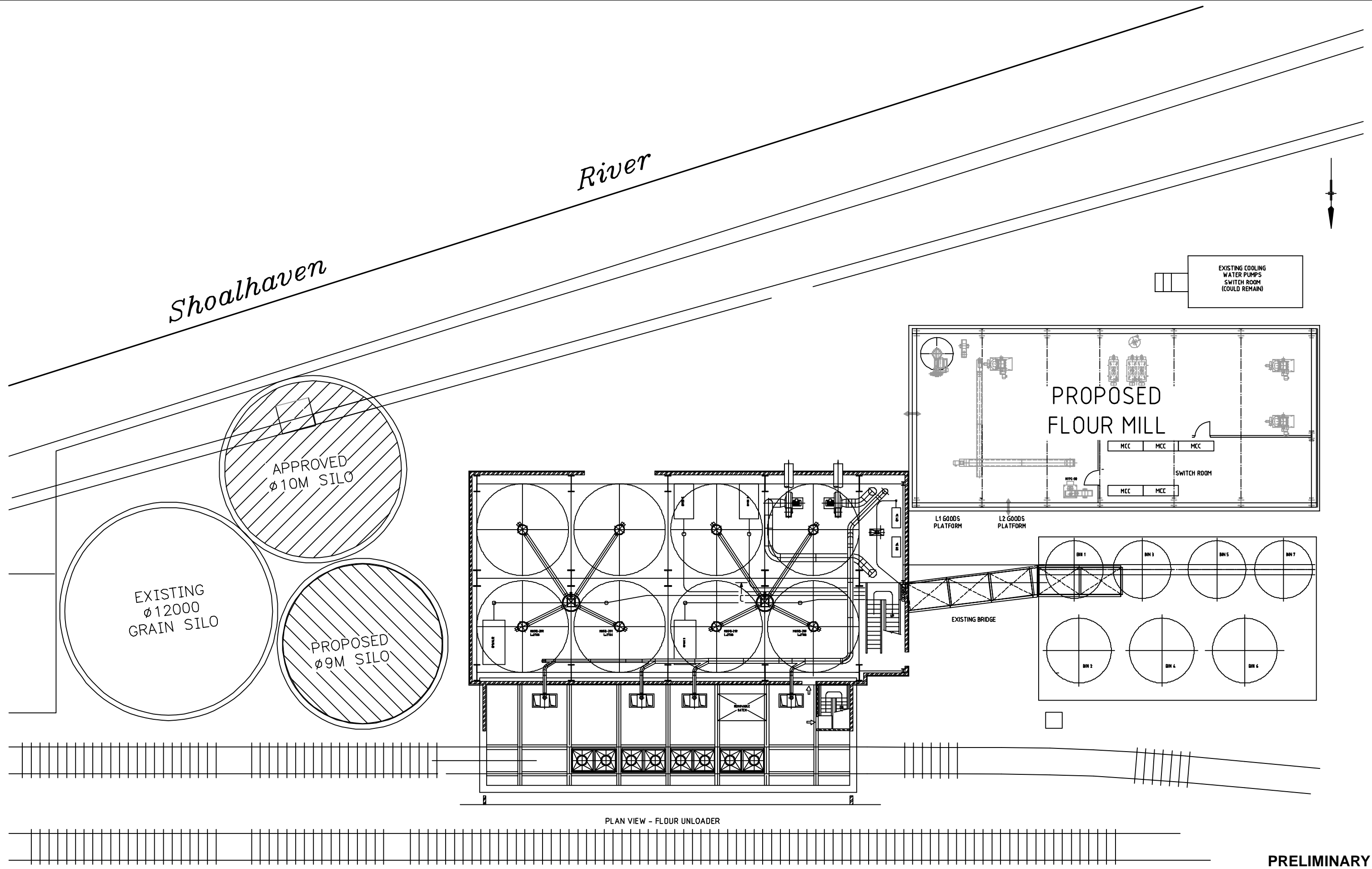
The new plant would be located at the existing Shoalhaven Starches premises at Bomaderry, within an existing storage area located between the grain processing, flour unloading and boiler house structures, on the banks of the Shoalhaven River, as detailed in Figure 1. The short flour mill would require the construction of an additional silo and flour processing building.

Wheat would be delivered to the site twice per week in rail hopper cars nominally of 60 tonne capacity. Each train would deliver approximately 3000 tonnes of wheat. The proposal would not alter the current number or frequency of train movements at the site.

Wheat delivered to the site by train would discharge through a grid below the hopper outlet, and would be transported via drag chains and a bucket elevator system into two silos, each of 1,600 tonne capacity.

Wheat would be taken from the raw wheat silos, weighed and then passed through various cleaning operations as follows:

- » Sieves for the removal of impurities larger or smaller than wheat;



PLAN VIEW - FLOUR UNLOADER

PRELIMINARY

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Plot Date: 22 March 2007 - 1:12 PM

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Client	MANILDRA GROUP		
Project	SHORT FLOUR MILL ENVIRONMENTAL ASSESSMENT		
Title	SITE LAYOUT		
	FIGURE 1		
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- » Gravity separators for the removal of heavy impurities such as stone;
- » Magnetic separators for the removal of ferrous metal impurities; and
- » Aspirators, using air currents, for the removal of lighter impurities.

The moisture content of wheat received at the site would typically be in the range of 8% - 10%, which is too dry for milling. Water would therefore be added to the wheat in a carefully controlled manner to increase the moisture content of the grain to around 15%. The damped wheat would then be stored in a conditioning or tempering bin where it would be allowed to remain for a period of time to allow the added moisture to be fully absorbed into the grain. Conditioning of grain would be necessary to:

- » Assist in the separation of the component parts of the grain by toughening the bran to ensure a clean separation of the endosperm from the bran and germ; and
- » Allow the reduction rollers to grind the endosperm into flour with the minimum power consumption, and ensure accurate and easy sifting on the following sieving machines.

When the grain is at the optimum milling condition it would be taken from the conditioning bins and passed through final scouring, weighing and separation stages before being passed to the mill. Milling would be carried out on roller mills which would mill the grain into progressively finer fractions.

Each milling process would be followed by coarse sieving to separate large flakes of bran and chunks of endosperm, which would then be passed to the next milling cycle. The finer starchy material would be passed over a series of progressively finer sieves to remove any flour, and to grade the remaining particles into various sizes for further grinding.

Flours from the various grinding operations would be collected and blended together before passing through final treatment and weighing operations to bulk storage bins. Flour would be taken from these bins for use in existing site production processes.

The coarse particles left at the end of the reduction system, known as pollard, and the bran from the end of the break system, would be combined into a single by-product (DDG) for sale as animal feed. All air extracted from the mill would be passed through Buhler Airjet bag houses prior to being discharged to the atmosphere.

The proposal would be powered by electrical energy, would not require any additional gas supply, and would use compressed air only for instrument use.



2. Odour Emission Assessment

GHD was commissioned to undertake a screening level impact assessment for odour emissions associated with the operation of the proposed flour mill. Emission points to air associated with the proposed flour mill are detailed in Table 1.

Table 1 Emission Points – Flour Mill

No.	Description	Air pollution control system	Air flow (m ³ /min)
1	Pneumatic fans and filters used to transport the milled flour from the roller mills	Cyclone and fabric filter	450
2	As above	Cyclone and fabric filter	170
3	Aspiration points on each roller mill, flour collection conveyors, and filter flow collection conveyor	Cyclone and fabric filter	150
4	Cleaning section for incoming wheat	Cyclone and fabric filter	400

2.1 Odour Emission Rate

A comprehensive odour audit is currently being conducted for the overall Shoalhaven Starches operations to identify odour sources and recommend mitigation actions where required.

GHD was advised by Shoalhaven Starches (D von Felten, *pers comm.*) that odour emissions associated with the existing on-site flour handling process would be representative of the odour emissions expected from the proposed flour mill, with the exception being that the mill might be slightly more odorous as it would be operated under warmer process conditions than the existing system. Consequently, a conservative approach has been taken to account for this potential increase in volatile odour emissions, by doubling the odour emission rate associated with the existing flour handling processes.

The significant sources of odour associated with the existing flour handling process include exhaust points for the flour bin motor drive, flour bin aspirators and the flour day bins. Odour emission rates from the existing grain silo were also included as part of this assessment as the proposed flour mill would include the addition of two smaller grain silos.

Table 2 details the measured odour emission rates associated with the existing flour handling processes.



Table 2 Odour emission inventory – existing flour handling processes

Odour source	Measured Odour emission rate (OU/s)
Grain silo	180
Flour day bin (5 of)	680
Flour bin motor drive	280
Flour bin aspirator (2 of)	1000
Total	2140

The total odour emission rate detailed in Table 2 represents the odour emissions associated with the handling of flour currently received on site.

To better represent the odour emission rates anticipated for the proposed flour mill, the emission rate detailed in Table 2 (2140 OU/s) was doubled to account for the potential increase in volatile odour emissions as a result of warmer operating conditions at the flour mill. This equates to a total odour emission rate for the flour mill of 4,300 OU/second.

2.2 Odour Emission Impact Assessment

The total odour emission rate for the flour mill of 4,300 OU/second equates to <0.1% of the existing total odour emission rate for the Shoalhaven Starches facility (excluding emissions from the Environmental Farm).

In addition to being a negligible odour source in terms of odour emission rate, emissions from the flour mill would be likely to have a neutral hedonic tone, which is to say that the odour would be regarded as being neither unpleasant nor pleasant.

Even with consideration given to potential future reductions in odour emissions from Shoalhaven Starches as a result of the implementation of various mitigation measures, the contribution from the flour mill would still be likely to be a negligible odour source. For example, if the overall odour emission rate at the site were reduced by 90% the contribution from the flour mill would still be <1% of total site emissions. Although the emissions from the flour mill would be negligible in the context of the existing site operations, the emissions could be considered for inclusion in any future collective treatment process developed for the site, although the benefits would be marginal.

It is concluded that odour emissions from the proposed flour mill would not have a significant incremental or cumulative odour impact at the Shoalhaven Starches site. This conclusion is further supported by the fact that other flour mills operated in NSW (including three operated by the Manildra Group) are not specifically regulated for odour emissions associated with the flour production process.



3. Particulate Matter Assessment

GHD was commissioned to undertake a screening level impact assessment of particulate matter emissions associated with the operation of the proposed flour mill.

GHD understands that all exhaust discharge points (refer to Table 1) on the proposed development would be equipped with Buhler Airjet filters, which are capable of achieving an in-stack particulate concentration of substantially less than 50 mg/m³ when operated in accordance with the manufacturer's instructions. The removal efficiency of the fabric filters would also be dependent on site-specific factors such as particle size, particle characteristics, electrostatic charging, mass rates and filter loading.

The *Protection of the Environment Operations (Clean Air) Regulation 2002* prescribes an in-stack standard of concentration for solid particles (or total suspended particulates) of 20 mg/m³. *The Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales* (2005) prescribes environmental impact assessment criteria for total suspended particulates of 90 µg/m³ (annual average) and fine particulates of 50 µg/m³ (24-hour average) and 30 µg/m³ (annual average), which must not be exceeded at the nearest sensitive receptors. The proposed short flour mill emissions would be required to comply with these standards.

3.1 Existing Particulate Emissions

Existing particulate emission sources at the site were identified through discussion with Manildra staff. The significant sources, and their emissions of fine particulate matter (PM₁₀) and total suspended particulates (TSP), are identified in Table 3.

Table 3 Existing Particulate Emissions

Significant Emission Source	Year	PM ₁₀		TSP	
		Concentration (mg/m ³)	Mass Emission Rate (g/s)	Concentration (mg/m ³)	Mass Emission Rate (g/s)
Coal-fired boiler No 2	2002	144	0.43 ¹ 0.86 ²	498	1.47 ¹ 2.94 ²
	2007	80.9	0.40	365	1.81
Coal-fired boiler No 4	2002	-	1.20	-	4.12
	2007	61.1	0.53	136.3	1.21
Coal-fired boilers No 5 & 6	2002	-	1.62	58.75	1.62
	2005	10.0	0.22	20	0.44
	2006	9.3	0.26	37	1.04
Total (minimum)	-	-	1.15	-	3.12

Notes: 2002 data obtained from Proposed Pollution Reduction Program No 7, Environmental Impact Statement, Air Quality Impact Statement (2002); 2005 data is mean data from the 2005 Environment Protection Licence Annual Return; 2006 data is mean data from the 2006 Environment Protection Licence Annual Return; 2007 data obtained from monitoring undertaken by Stephenson Environmental Management Australia on 20 April 2007; ¹ – Annual average; ² – Short term average.



The Air Quality Impact Statement from the Proposed Pollution Reduction Program No 7 (PRP7) Environmental Impact Statement (EIS) concluded that the maximum predicted ground level concentrations for TSP and PM₁₀ would comply with the relevant impact assessment criteria, as detailed in Table 4.

Table 4 Maximum Predicted Ground Level Particulate Concentrations

Pollutant	Averaging Period	Air Quality Goal	Maximum Predicted Ground Level Concentration - Incremental	Maximum Predicted Ground Level Concentration – Cumulative ¹	Compliance
PM ₁₀	24 hour	50 µg/m ³	31.8 µg/m ³	46 µg/m ³	Complies
PM ₁₀	Annual	30 µg/m ³	9.8 µg/m ³	24 µg/m ³	Complies
TSP	Annual	90 µg/m ³	25.2 µg/m ³	-	Complies

Source: Proposed Pollution Reduction Program No 7, Environmental Impact Statement, Air Quality Impact Statement (2002).

Notes: ¹ Including background data obtained from PM₁₀ monitoring at Albion Park of 14.2 µg/m³

3.2 Anticipated Flour Mill Emissions

Particulate emissions from Manildra's existing flour mill at Manildra, NSW, were measured by Stephenson Environmental Management Australia (SEMA) on 16 April 2007, to provide data on which to base the impact assessment. Measurements were taken from the cleaning, pneumatic and mill baghouses. The baghouses are considered to be representative of the baghouse specifications proposed for the short flour mill at the Shoalhaven Starches site. The results of the monitoring are summarised in Table 5.

Table 5 PM₁₀ and TSP In-stack Emissions, Manildra Flour Mill

Source	PM ₁₀		TSP	
	Concentration (mg/m ³)	Mass Emission Rate (g/s)	Concentration (mg/m ³)	Mass Emission Rate (g/s)
Cleaning Baghouse Run 1	1.0	0.011	0.9	0.009
Cleaning Baghouse Run 2	0.1	0.002	0.8	0.009
Mean	0.55	0.007	0.85	0.009
Pneumatic Baghouse Run 1	0.1	0.001	2.0	0.0189
Pneumatic Baghouse Run 2	0.2	0.002	0.5	0.0046
Mean	0.15	0.0015	1.25	0.012
Mill Baghouse Run 1	< 0.02	< 0.0004	0.7	0.003
Mill Baghouse Run 2	< 0.02	< 0.0004	0.04	0.0002
Mean	< 0.02	< 0.0004	0.37	0.0016



It is apparent from Table 5 that emission concentrations and mass emission rates from the existing flour mill at Manildra are low for both PM₁₀ and TSP. Mean PM₁₀ emissions were highest from the cleaning baghouse (0.55mg/m³), while mean TSP emissions were highest from the pneumatic baghouse (1.25mg/m³).

The proposed short flour mill development would have four baghouses to control emissions to air. The worst-case emissions scenario has been based on an assumption that all four baghouses would have the same performance as the worst-performing baghouse at the Manildra site (as detailed in Table 5). Consequently, the total anticipated worst-case emissions from the short flour mill have been calculated as being four times the worst case mean level detailed in Table 5, and would be:

- » PM₁₀ – 0.028 g/s; and
- » TSP – 0.048 g/s.

3.3 Particulate Emission Impact Assessment

3.3.1 In Stack Concentration

The monitoring data obtained from the existing flour mill at Manildra, NSW (detailed in Table 5) shows a maximum mean in-stack TSP emission concentration of 1.25 mg/m³. As this emission data is considered to be representative of the emissions expected from the proposed short flour mill at Shoalhaven Starches, it is concluded that the TSP emissions from the development would comply with the in-stack standard of concentration (20 mg/m³) prescribed by the *Protection of the Environment Operations (Clean Air) Regulation 2002*.

3.3.2 Environmental Impact

Comparing the worst-case emissions scenario (detailed in Section 3.2) against the existing site total particulate emissions (detailed in Table 3), it is apparent that the proposed flour mill emissions would represent an additional:

- » 2.4% of the existing PM₁₀ mass emission rate; and
- » 1.5% of the existing TSP mass emission rate.

Maximum predicted ground level particulate concentrations would, at worst, be expected to increase in direct proportion to the additional emissions. This is a highly conservative assumption given that the location of the maximum incremental impact associated with the boilers and proposed flour mill is likely to be different due to the difference in the emission source release parameters. The maximum predicted ground level particulate concentrations during operation of the short flour mill are detailed in Table 6.



Table 6 Maximum Predicted Ground Level Particulate Concentrations

Pollutant	Averaging Period	Air Quality Goal	Maximum Predicted Ground Level Concentration - Incremental	Maximum Predicted Ground Level Concentration – Cumulative ¹	Compliance
PM ₁₀	24 hour	50 µg/m ³	32.6 µg/m ³	46.8 µg/m ³	Complies
PM ₁₀	Annual	30 µg/m ³	10.0 µg/m ³	24.2 µg/m ³	Complies
TSP	Annual	90 µg/m ³	25.6 µg/m ³	-	Complies

3.4 Conclusion

It is apparent that the dominant particulate emission sources at the Shoalhaven Starches facility are the coal fired boilers, and particularly boilers No 2 and 4.

The proposed short flour mill would only marginally increase PM₁₀ and TSP emissions above existing levels, and the associated maximum predicted ground level concentrations would still comply with the relevant air quality goals. Consequently, it is considered that the proposed development would have a negligible impact on particulate emissions and concentrations in the vicinity of the site.

3.5 Recommendations and Mitigation Measures

Notwithstanding the conclusion that the proposed development would not significantly alter existing air quality in the vicinity of the site, appropriate mitigation measures would be implemented through the construction and operation phases to ensure that air quality impacts would be minimised.

3.5.1 Construction phase

It is anticipated that the application of mitigation measures to reduce dust generation and vehicular emissions during construction would minimise dust generation to acceptable levels. Mitigation measures that would be implemented to minimise potential impacts on air quality include:

- » Visible dust emissions from earth moving and transport activities would be the focus of prompt mitigation through the use of dust-suppressing sprays from water carts;
- » The extent of exposed and unprotected areas would be limited by preserving existing groundcover (through staged clearing) and all disturbed areas would be stabilised as soon as possible;
- » Stockpiles would be kept to a minimum;
- » All haulage vehicles loads would be covered while transporting material to and from the work area;
- » Construction traffic would be restricted to designated areas, which would be covered with a gravel/bitumen surface where practicable and subjected to regular dust suppression (e.g. water cart);
- » Where practicable, specific areas of the construction site (e.g. stockpiles) would be fenced with shade-cloth to minimise wind erosion and the transport of dust beyond the site boundary;



- » Vehicular speeds would be limited to 15 km / hour on areas of unconsolidated or un-vegetated soil associated with the project area; and
- » All construction and administrative vehicles would be maintained in a serviceable condition such that exhaust emissions are minimised.

3.5.2 Operation Phase

It is recommended that post-commissioning testing be undertaken to assess compliance with the standard of concentration prescribed under the *Protection of the Environment Operations (Clean Air) Regulation 2002*.



4. Greenhouse Gas Emissions

Greenhouse gas emissions from the proposed flour mill would be predominantly associated with the electrical energy required for the operation of the plant, equipment and lighting. The proposal would not alter the total volume or tonnage of raw material transported to the site by train as it would merely substitute wheat deliveries in place of existing flour deliveries. Consequently this potential emission source has been considered to be negligible, and has therefore been excluded from this assessment. The proposed mill would also not utilise steam during the process, and would not directly combust gas or any other fuels. Electricity would be used on site to operate lighting and equipment.

4.1 Plant and Equipment Power Requirements

The electrical energy required to operate the new equipment and machinery in the proposed mill was based on the draft Motor List (dated December 12, 2006) provided by Manildra, which is presented in Appendix A. Values were estimated for the equipment for which power information was not available, resulting in an increase of approximately 10% in the total power requirement of the listed equipment, to 1.7 MW. The greenhouse gas emissions calculation was based on the following assumptions (D von Felten, pers comm):

- » All plant and equipment would operate 24 hours per day, 365 days per year, except during maintenance and cleaning shut downs.
- » All plant and equipment would operate at a loading of 80%.
- » Maintenance shutdowns would be scheduled every three weeks, for an eight-hour period (a total of 139 hours per year).

The plant would therefore operate for 8621 hours per year with a corresponding annual electricity consumption of approximately 11,725 MWh, calculated as:

$$\text{Rated megawatts} \times \text{loading factor} \times \text{hours/year}.$$

4.2 Lighting Power Requirements

The electricity required for lighting the building was calculated based on the following assumptions:

- » The typical lighting requirement for industrial or factory buildings, of 20 W/m² of floor area.
- » A floor area of approximately 237 m² (based on a length of 22.8 m and a width of 10.4 m) as calculated from the scale plan on which Figure 1 is based.
- » That only one floor in the building would require lighting at any given time, as the lights on each floor would be activated by motion sensors, and there would only be one plant manager on site most of the time.
- » That lighting would be required during maintenance shut downs.

The operation of lighting on one floor for 24 hours per day, 365 days per year equates to a total of 8770 hours annually, with an electricity requirement of close to 42 MWh calculated as:

$$(\text{Floor area} \times \text{lighting requirement} \times \text{hours/year}) / 1,000,000.$$



4.3 Total Greenhouse Gas Emissions

To calculate the total greenhouse gas emissions associated with the flour mill, the sum of the annual electricity consumption figures associated with plant, equipment and lighting (11,767 MWh) was multiplied by the Australian Greenhouse Gas Office (AGO) emission factor for electricity usage in New South Wales of 1.068 kg CO₂-e/kWh (*AGO Factors and Methods Workbook*, December 2006).

The additional greenhouse gas emissions associated with the proposed flour mill at the existing Shoalhaven site would be 12,567 tCO₂-e per year.



5. Site Stormwater Management

5.1 Existing Site Stormwater Management System

Shoalhaven Starches existing site stormwater management system is divided into three zones as detailed on Figure 2. The zones are:

- » Eastern portion of the site – all site stormwater is collected and passed through a first flush pit to remove gross solids and pollutants prior to discharge to the Shoalhaven River;
- » Central portion of the site – all site stormwater is collected in pits and drainage channels and conveyed to the Environmental Farm where it is stored in dams prior to being irrigated. No stormwater from this zone is discharged to the Shoalhaven River; and
- » The Western portion of the site – all stormwater is collected and pumped to the Environmental Farm during small storm events. Stormwater is discharged to the Shoalhaven River during heavy rainfall events.

5.2 Construction Stormwater Management

The proposed flour mill development would be located entirely within the central portion of the site, and consequently all construction runoff generated at the site during construction works would be conveyed to the Environmental Farm for treatment. No runoff or stormwater would be discharged to the Shoalhaven River. The erosion and sediment controls proposed for the works (refer Section 6) have been developed to ensure that construction runoff is contained on site and not discharged to the river.

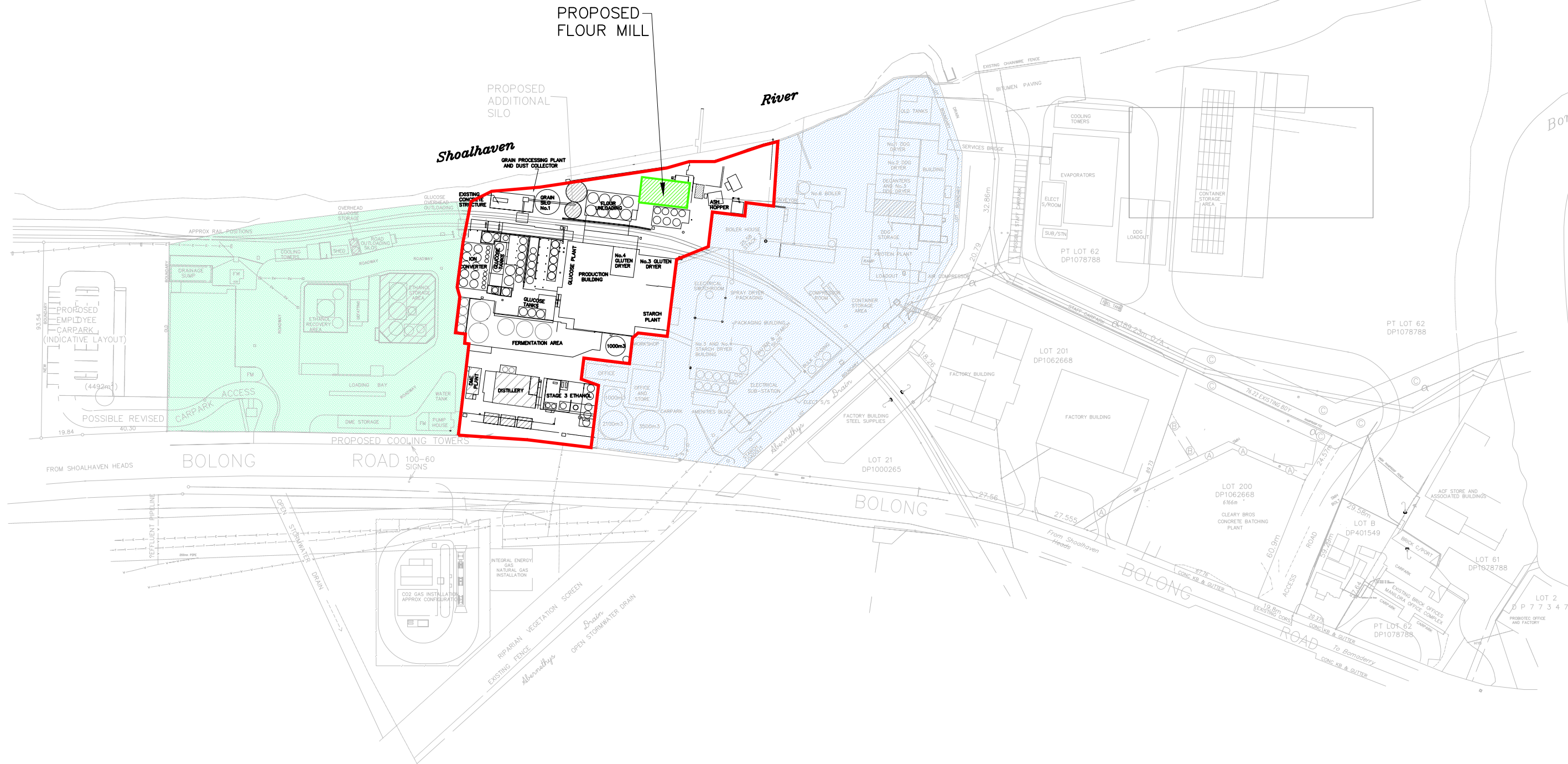
5.3 Operational Stormwater Management

The proposed works would not alter the existing site stormwater management system, and consequently all stormwater generated by the proposed flour mill during the operational phase would be discharged to the Environmental Farm.

The proposed flour mill would also not increase the volume of stormwater generated from this area of the site during operation as the area is currently all surfaced with bitumen.

STORMWATER FLOWS

- STORMWATER FLOWS TO FIRST FLUSH PIT
- STORMWATER FLOWS TO ENVIRONMENTAL FARM WASTEWATER MANAGEMENT SYSTEM VIA COLLECTION PITS
- STORMWATER FLOWS TO COLLECTION PITS, THEN PUMPED TO FARM IN SMALL STORM EVENT AND RELEASED TO RIVER AFTER HEAVY RAINFALL
- PROPOSED FLOUR MILL & ADDITIONAL STORAGE SILO NOVEMBER 2006



PRELIMINARY

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Client	MANILDRA GROUP
Project	SHORT FLOUR MILL ENVIRONMENTAL ASSESSMENT
Title	SITE STORMWATER MANAGEMENT PLAN
Figure	FIGURE 2
Original Size	A1
Drawing No:	23-11989-FIG002
Rev:	A



6. Environmental Management and Mitigation

6.1 Legislative Requirements

All activities carried out on the site, and in relation to the project, would comply with the relevant provisions of all relevant legislation and regulations, and would also comply with relevant policies and guidelines relating to the construction and operation of the project including, but not limited to, those detailed in Sections 6.1.1 and 6.1.2.

6.1.1 Legislation and Regulations

- » *Aboriginal and Torres Strait Islander Heritage Protection Act 1984;*
- » *Contaminated Land Management Act 1997;*
- » *Dangerous Goods Act 1975;*
- » *Environment Protection and Biodiversity Conservation Act 1999;*
- » *Environmental Planning and Assessment Act 1979;*
- » *Environmental Planning and Assessment Regulations 2000;*
- » *Environmentally Hazardous Chemicals Act 1985;*
- » *Fisheries Management Act 1994;*
- » *Fisheries Management Amendment Act 2001;*
- » *Heritage Act 1977;*
- » *Heritage Amendment Act 1998;*
- » *Local Government Act 1993;*
- » *National Parks and Wildlife Act 1974;*
- » *National Parks and Wildlife Amendment Act 2002;*
- » *Native Vegetation Act 2003;*
- » *Native Vegetation Conservation Act 1997;*
- » *Noxious Weeds Act 1993;*
- » *Occupational Health and Safety Act 2000;*
- » *Ozone Protection Act 1989;*
- » *Pesticides Act 1999;*
- » *Protection of the Environment Operations Act 1997;*
- » *Protection of the Environment Administration Act 1997;*
- » *Rivers and Foreshores Improvement Act 1984;*
- » *Roads Act 1993;*
- » *Rural Fires Act 1997;*



- » *Soil Conservation Act 1938;*
- » *Threatened Species Conservation Act 1995;*
- » *Threatened Species Conservation Amendment Act 2002;*
- » *Waste Avoidance and Resource Recovery Act 2001;*
- » *Waste Recycling and Processing Corporation Act 2001;*
- » *Water Act 1912; and*
- » *Water Management Act 2000.*

6.1.2 Polices and Guidelines

- » *Managing Urban Stormwater: Soils and Construction*, NSW Department of Housing (1998);
- » *Australian and New Zealand Guidelines for Fresh and Marine Water Quality*, Australian and New Zealand Environment and Conservation Council, and the Agriculture and Resource Management Council of Australia and New Zealand (2000);
- » *National Environment Protection Measures (NEPM) for Ambient Air Quality*, NEPC (1998); and
- » *Industrial Noise Policy*, DEC (1999).

6.2 Approvals, Permits and Licences

All necessary approvals, permits and licences required by NSW legislation must be obtained prior to construction commencing. Approvals, permits and licences that may be necessary may include, but are not necessarily limited to:

- » A permit under Part 3a of the *Rivers and Foreshores Improvement Act 1948* for any works undertaken within 40m of the banks of a watercourse, issued by the Department of Natural Resources; and
- » The Contractor and the Proponent are obliged to notify DEC when a pollution incident occurs that causes or threatens 'material harm' to the environment, under the *Protection of the Environment Operations Act, 1997*.

The Contractor and Proponent would liaise with relevant government agencies to ensure that all their requirements are met in relation to approvals, permits and licences. The relevant government agencies include, but may not be limited to:

- » NSW Department of Environment and Conservation (water, air, noise, waste, pollution, flora, fauna, and aboriginal heritage issues); and
- » NSW Department of Natural Resources (works in or near waterways).

All necessary licences, approvals and permits obtained by the Contractor and/or Proponent must be complied with, maintained and renewed as necessary throughout the duration of the works.



6.3 Construction Environmental Management Plan

The Contractor/Proponent would prepare a Construction Environmental Management Plan (CEMP). The CEMP would be prepared generally in accordance with the framework, principles and requirements detailed in AS/NZS ISO 14001:2004: *Environmental management systems - Specification with guidance for use*.

The CEMP would be developed prior to site activities commencing, and would be fully implemented, maintained, reviewed, audited and updated throughout the construction phase as may be required by the Conditions of Approval, or as otherwise directed.

In addition to the generic requirements of ISO/NZS 14001 the CEMP would address and/or develop:

- » All relevant Conditions of Approval and environmental requirements;
- » All other environmental control measures, actions, procedures and activities required to address all relevant legislation, regulations, guidelines and policies;
- » Environmental monitoring programs, including the identification of monitoring locations, equipment, methodologies, analytical requirements, quality trigger levels/thresholds, and reporting mechanisms;
- » Roles and responsibilities for the environmental management of the works;
- » Environmental training requirements, procedures, and documentation; and
- » A complaints management and community consultation/notification process.

The CEMP would document the key environmental management measures associated with the construction phase of the project, which would include, but not necessarily be limited to:

- » General environmental management measures;
- » Erosion and sediment control;
- » Air quality (dust);
- » Noise; and
- » Waste and chemical management.

Further details on each key issue are provided in Sections 6.3.1 to 6.3.5. Appropriate environmental mitigation and control measures for each key issue are detailed in Table 7 to Table 11.

6.3.1 General environmental management

General environmental mitigation measures for the project are detailed in Table 7.

Table 7 Environmental management framework

Environmental Management Framework
All safeguard measures detailed in the Environmental Assessment would be applied to the project.
Construction activities would be managed to comply with the premises' Environment Protection Licence noise limits, which range from 38 – 42 dB(A) when measured at the nearest residences. Noisy construction activities would generally be undertaken during daylight hours, although some construction activities would be undertaken outside these hours if they comply with the EPL noise



Environmental Management Framework

limits.

Environmental awareness training would be provided to all personnel (including all labourers/ plant operators/ supervisors and engineers), and would address, but not be limited to:

- » Sedimentation and erosion control;
- » Water quality control;
- » Pollution control; and
- » DEC requirements.

The training would commence at the start of construction and would continue as new personnel are engaged.

A register of environmental awareness training would be established and maintained at the site. The register would contain details of the type of training, personnel trained, training dates and qualifications of the trainer.

All necessary approvals, permits and licences required by NSW legislation would be obtained prior to construction commencing. These approvals, permits and licences would be maintained and complied with during the construction period. Liaison would occur with the:

- » Department of Environment and Conservation (water, air, noise, waste, pollution, flora, fauna, and aboriginal heritage issues);
- » Department of Natural Resources (works near waterways); and
- » Heritage Office of NSW (non-indigenous heritage issues).

to ensure all their requirements are met in relation to approvals, permits and licences.

All wastes would be transported by licensed waste management contractors and would be disposed of to an appropriately licensed waste management facility.

A register of public complaints would be established at time of construction commencing and maintained for the full duration of construction. The register would record details of complaints, complainant contact information and action taken to address complaints.

Any complaints received would be recorded and attended to promptly. On receiving a complaint, works would be reviewed to determine whether issues relating to the complaint could be avoided or minimised. Feedback would be provided to the complainant explaining what outcomes resulted.

6.3.2 Soil and water management

The potential impacts of construction activities on soil and water resources are generally associated with the erosion of soils and subsequent discharge of sediments or turbid runoff to watercourses, together with pollution associated with the spillage of fuels, chemicals, and other materials into waterways.

The location of the construction activities immediately adjacent to the banks of the Shoalhaven River increases the risk of potential impacts to the river occurring, although the site stormwater management system would collect all runoff from the construction area and convey it to the Environmental Farm for treatment and irrigation. However, additional environmental control measures have been developed to further minimise the risk of discharges to the Shoalhaven River, as detailed in Table 8.

Acid Sulphate Soils (ASS) are not expected to be encountered on site and consequently have not been considered further.



Table 8 Soil and water management measures

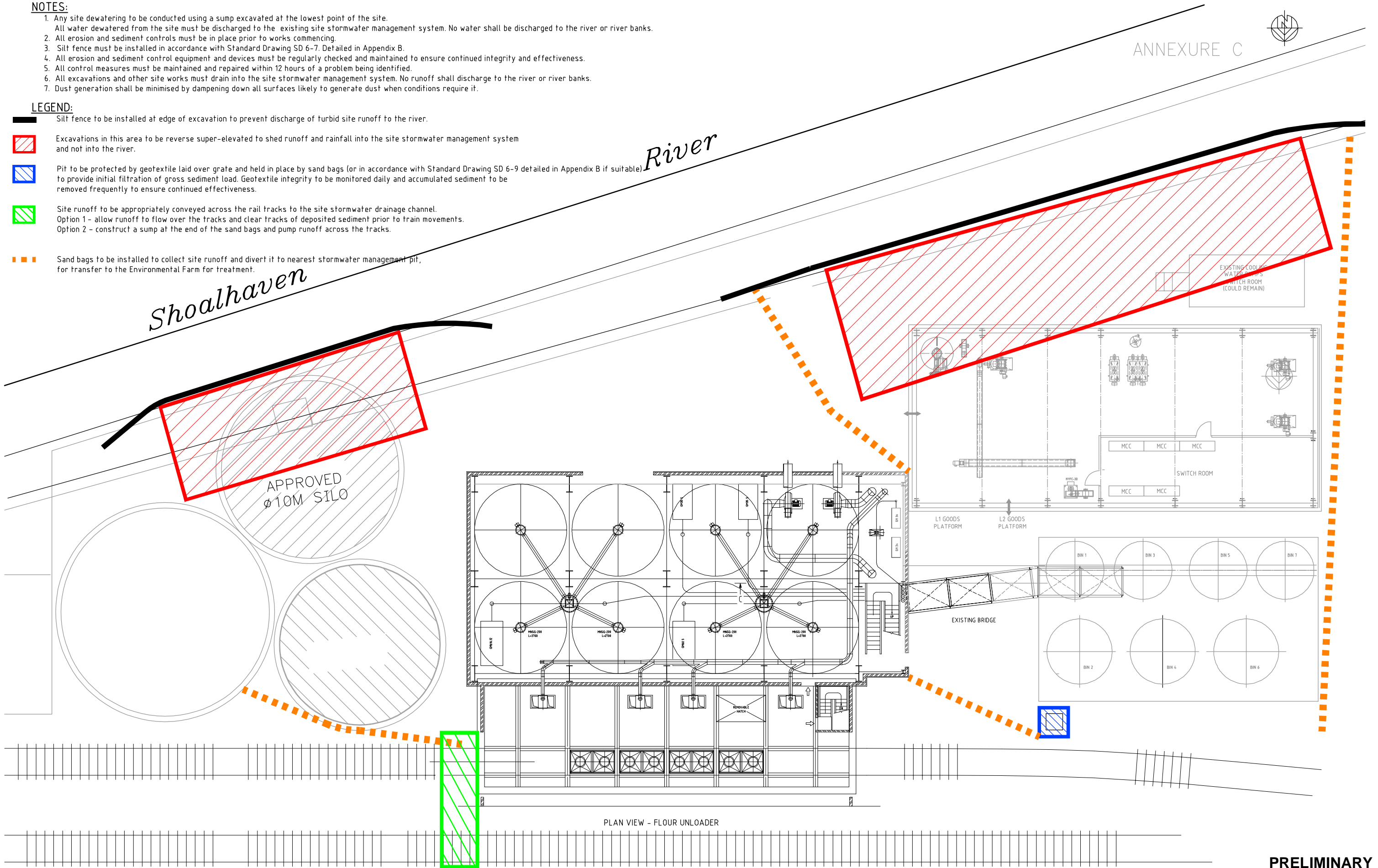
Soil and Water Management Measures
A site-specific Erosion and Sediment Control Plan (ESCP) has been developed for the project (refer Figure 3). The ESCP identifies appropriate control measures and practices to prevent soil and erosion impacts, and discharges of turbid site runoff to the Shoalhaven River.
All erosion and sediment control measures detailed in the ESCP would be implemented on site prior to construction commencing.
All sediment and erosion controls would be inspected by the Contractor/Proponent at a minimum of weekly intervals and within 24 hours of all rainfall events exceeding 10 mm in a 24-hour period. Regular routine maintenance would be undertaken to de-silt sediment basins and traps, replace damaged sediment control fences and other structures. A register of these inspections, maintenance and rainfall levels would be maintained. One person would have overall responsibility on site for erosion and sediment control issues.
Loss of suspended solids and sediment to the Shoalhaven River would be prevented by using temporary or reverse superelevation for any excavations, constructing berms along the edge of the site to prevent runoff to the river and installing silt fences along the property boundary with the river.
A silt fence would be installed between the site and the Shoalhaven River, along the entire perimeter of the construction area, to prevent suspended solids being transported off-site. The silt fence would be constructed in accordance with Standard Drawing SD 6-7, from the publication <i>Managing Urban Stormwater: Soils and Construction</i> , NSW Department of Housing (1998).
All site runoff would be collected and diverted to the site stormwater management system, which would then convey it to the Environmental Farm for treatment and irrigation, thereby preventing any off-site impacts.
The inlet grates of the site stormwater management system would be covered with geotextile to provide initial filtering of gross sediment pollutants before conveyance to the Environmental Farm. Alternatively, the grates could be protected by implementing the control measure detailed in Standard Drawing SD 6-9, from the publication <i>Managing Urban Stormwater: Soils and Construction</i> , NSW Department of Housing (1998).
Works relating to drainage and sediment control would be completed promptly to minimise exposure time of disturbed areas.
Exposed areas of erodible material would be limited to those areas being actively worked.
Any material stockpiles on site would be designed and located to prevent any loss of sediment, or other materials, to the Shoalhaven River in the event of heavy or prolonged rainfall
Temporary sediment control fences would be installed below any stockpiles.
Stockpiles would not be located within 50 m of a watercourse, in accordance with NSW Fisheries requirements.
In the event of a spillage of potentially harmful chemicals, fuels, oils or materials, the DEC would be contacted immediately, and contaminants would be immediately contained, removed, treated (if necessary) and disposed of in accordance with DEC requirements.
An incident/emergency spill plan would be developed. This would include measures to avoid spillages of fuels, chemicals, and fluids onto the floodplain and/or into any waterways. All personnel would be made aware of these measures. An emergency spill kit would be kept onsite at all times.

NOTES:

- Any site dewatering to be conducted using a sump excavated at the lowest point of the site.
All water dewatered from the site must be discharged to the existing site stormwater management system. No water shall be discharged to the river or river banks.
- All erosion and sediment controls must be in place prior to works commencing.
- Silt fence must be installed in accordance with Standard Drawing SD 6-7. Detailed in Appendix B.
- All erosion and sediment control equipment and devices must be regularly checked and maintained to ensure continued integrity and effectiveness.
- All control measures must be maintained and repaired within 12 hours of a problem being identified.
- All excavations and other site works must drain into the site stormwater management system. No runoff shall discharge to the river or river banks.
- Dust generation shall be minimised by dampening down all surfaces likely to generate dust when conditions require it.

LEGEND:

- Silt fence to be installed at edge of excavation to prevent discharge of turbid site runoff to the river.
- Excavations in this area to be reverse super-elevated to shed runoff and rainfall into the site stormwater management system and not into the river.
- Pit to be protected by geotextile laid over grate and held in place by sand bags (or in accordance with Standard Drawing SD 6-9 detailed in Appendix B if suitable) to provide initial filtration of gross sediment load. Geotextile integrity to be monitored daily and accumulated sediment to be removed frequently to ensure continued effectiveness.
- Site runoff to be appropriately conveyed across the rail tracks to the site stormwater drainage channel.
Option 1 - allow runoff to flow over the tracks and clear tracks of deposited sediment prior to train movements.
Option 2 - construct a sump at the end of the sand bags and pump runoff across the tracks.
- Sand bags to be installed to collect site runoff and divert it to nearest stormwater management pit, for transfer to the Environmental Farm for treatment.



PRELIMINARY

No	Revision	Note: * indicates signatures on original issue of drawing or last revision of drawing	Drawn	Checked	Approved	Date

Plot Date: 22 March 2007 - 5:01 PM

Cad File No: G:\23111989\CADD\Drawings\Environmental\23-11989-FIG003-RA.dwg



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Drawn	DY	Designed	JE
Drafting	JE	Design	JE
Check		Check	
Approved	JE		
Date	15/03/07		
Scale	N.T.S.	This Drawing must not be used for Construction unless signed as Approved	

Client	MANILDRA GROUP
Project	SHORT FLOUR MILL ENVIRONMENTAL ASSESSMENT
Title	FIGURE 3. EROSION AND SEDIMENT CONTROL PLAN
Original Size	A1
Drawing No:	23-11989-FIG003
Rev:	A



Soil and Water Management Measures

All fuels, chemicals, and liquids would be stored at least 50 m away from any waterways or drainage lines within an impervious bunded area.

All erosion and sediment control structures would be removed only after adequate stabilisation of disturbed surfaces is achieved.

Any wastewater generated from construction processes would be contained onsite and directed to the site stormwater management system for conveyance to the Environmental Farm for treatment and irrigation. The discharge of water into waterways would be prohibited.

The refuelling of plant and maintenance of machinery would be undertaken within impervious bunded areas within the compound sites.

Vehicle wash downs and/or cement washouts would be undertaken within a designated bunded area with impervious surfaces.

6.3.3 Noise and vibration management

The construction process would generate both noise and vibration from heavy plant and equipment. However, the levels of noise and vibration would be likely to be similar to existing background levels associated with the existing plant. This notwithstanding, the Proponent/Contractor would implement appropriate noise and vibration management measures as detailed in the Environmental Assessment (EA) and as may be required by the Conditions of Approval.

The noise and vibration mitigation management measures would include the appropriate siting of plant, equipment, compounds, and machinery to minimise noise impacts, and construction noise monitoring to monitor compliance with the noise limits specified in the premise's Environment Protection Licence, as detailed in Table 9.

The potential effects of operational noise have been addressed in the design of the facility and are outside the scope of this assessment.

Table 9 Noise and vibration management measures

Noise and Vibration Management Measures
Appropriate noise and vibration mitigation measures would be developed and implemented throughout the construction process, including all commitments made in the EA, and required by the Conditions of Approval.
Construction activities would be managed to comply with the premises' Environment Protection Licence noise limits, which range from 38 – 42 dB(A) when measured at the nearest residences. Noisy construction activities would generally be undertaken during daylight hours, although some construction activities would be undertaken outside these hours if they comply with the EPL noise limits.
Plant and equipment would be selected and operated with appropriate mufflers and noise controls and where practical work practices and plant selection would be considered so as to minimise noise impacts.
High efficiency mufflers would be used on all construction equipment and manufacturer's noise control equipment would remain intact. All construction equipment would be well maintained and serviced.



Noise and Vibration Management Measures

Construction noise levels would be regularly monitored throughout construction activities so that performance against the noise levels specified in the premise's Environment Protection Licence could be assessed.

6.3.4 Air quality management

Construction activities have the potential to generate dust. The Proponent/Contractor would manage potential dust and air quality issues during construction by implementing appropriate control measures, including those detailed in Table 10.

Table 10 Air quality management measures

Air Quality Management Measures
Appropriate air quality mitigation measures would be developed and implemented throughout the construction process, including all commitments made in the EA, and required by the Conditions of Approval.
Regular on-site watering of dust-generating materials would be used to control dust generation during construction. Adequate dust suppression resources would be available on site to reduce dust emissions.
Additional measures implemented to reduce dust emissions during construction would include: <ul style="list-style-type: none"> Alternative timing of dust generating activities; Stopping of construction activities in very high wind conditions; Consideration of quickening of work in problem areas; Use of wind direction to advantage; Ensuring trucks are covered at all times when transporting or storing materials; Stabilisation of exposed areas as quickly as possible or within 14 days after completion of works; Confining vehicle movements to designated areas; and Appropriately located stockpile and compound sites.
The extent of exposed and unprotected areas would be limited by preserving existing groundcover (through staged clearing), and all disturbed areas would be stabilised as soon as possible.
Loads with the potential to generate dust, which are to be carried on public streets, would be covered during transportation.
Exhaust systems of construction plant, vehicles and machinery would be maintained in accordance with manufacturers specifications and the exhaust emissions would comply with the requirements of relevant legislation.
No open fires would be permitted on the project.
Stockpiles would be kept to a minimum.
Where practicable, specific areas of the construction site (e.g. stockpiles) would be fenced with shade-cloth to minimise wind erosion and the transport of dust beyond the site boundary.



Air Quality Management Measures
Any stockpiles with the capacity to cause dust would be dampened to suppress dust.
When dust is visually detected, the frequency of watering would be increased. Dust generating activities would be reprogrammed to avoid periods of high wind velocity.
If works are creating high levels of dust that are likely to cause discomfort to local residents or a safety hazard to work personnel, the works would be modified or stopped until the dust hazard is eliminated or has been reduced to an acceptable level.
Tailgates would be secured during the operation of trucks and utes. All haulage vehicle loads would be covered while transporting material to and from the work area.
Construction traffic would be restricted to designated areas, which would be covered with a gravel/bitumen surface where practicable and subjected to regular dust suppression (e.g. water cart).
Vehicular speeds would be limited to 25 km / hour on areas of unconsolidated or un-vegetated soil associated with the project area.
All vehicles would be maintained in a serviceable condition such that exhaust emissions are reduced to typical levels.
Machinery would be turned off, rather than left idling for long periods.

6.3.5 Waste and chemical management

The potential environmental impacts associated with spillages of chemicals, fuels and oils to both water and soils would be minimised through the implementation of detailed control measures designed to minimise the risk of such spillages occurring. In addition, appropriate waste management measures would be implemented to ensure that waste is avoided, minimised or recycled wherever possible, or responsibly disposed of.

Appropriate mitigation and management measures are detailed in Table 11.

Table 11 Waste and chemical management measures

Waste and Chemical Management Measures
An incident emergency spill plan would be developed and implemented as required. This would include measures to avoid spillages of fuels, chemicals, and fluids into any waterways. All personnel would be made aware of these measures. An emergency spill kit would be kept onsite at all times.
Storage areas for fuels, oils and chemicals would be surrounded by impervious bund walls to contain any spillage. Storage areas would not be located within 50 metres of any waterway, on slopes above 10%, or near areas of native vegetation. All precautions would be taken to eliminate fuel or other spills.
Storage areas for fuels, oils and chemical used in construction would be surrounded by bund walls to retain any spills. The bund would contain at least 110% of the volume of the largest container.
The storage of chemicals on site would comply with the requirements of relevant authorities (DEC and Workcover).
A schedule of all hazardous materials in use on the works would be maintained and recorded for the duration of the construction.



Waste and Chemical Management Measures

Refuelling operations would not be left unattended whilst refuelling is in progress. Refuelling of plant and maintenance would not occur within 50m of waterways or sensitive areas.

The refuelling of plant, and maintenance of machinery, would be undertaken within impervious bunded areas.

Should any spillage of fuels, oils, chemicals or other potentially hazardous/polluting materials occur during construction the DEC would be contacted immediately, and contaminants would be immediately contained, removed, treated (if necessary) and disposed of in accordance with DEC requirements.

All wastes would be transported by licensed waste management contractors and would be disposed of to an appropriately licensed waste management facility

The construction site would be maintained in a clean and tidy condition. Covered bins would be provided for waste disposal.

The Resource Management Hierarchy principles of the WARR Act would be adopted 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 undertaken as a last resort.

Measures to avoid, reduce, re-use and recycle waste products including soil, pavement materials, concrete, and oils would be implemented.

If concrete agitator trucks are to be washed out on site, an impermeable bunded area would be constructed to contain wash out water and allow the concrete residue to settle. The concrete residue would be incorporated into the works or disposed of at a licensed waste depot.

All construction materials, surplus soils and wastes generated from the site would be stockpiled and stored at the site prior to reuse, recycling or disposal. Measures would be implemented to prevent any scouring or loss of stockpiled materials during flood events.

Wastes would not be stored for long periods during construction of the site. Empty drums of fuels, oils or chemicals and fluids would not be stored on site during construction.

Materials or equipment that fall into or adjacent to the Shoalhaven River would be recovered immediately.

Waste material generated would be reused or recycled where possible.



7. Conclusion and Recommendations

7.1 Conclusion

It is concluded that:

- » The total odour emission rate for the flour mill would not have a significant incremental or cumulative odour impact at the Shoalhaven Starches site, and would equate to <0.1% of the existing total odour emission rate for the Shoalhaven Starches facility (excluding emissions from the Environmental Farm).
- » Odour emissions from the flour mill would be likely to have a neutral hedonic tone, which is to say that the odour would be regarded as being neither unpleasant nor pleasant.
- » All exhaust discharge points would be equipped with Buhler Airjet filters, which are capable of achieving an in-stack particulate concentration of considerably less than 50 mg/m³.
- » Emissions of total suspended particulates would comply with the concentration prescribed by the *Protection of the Environment Operations (Clean Air) Regulation 2002*.
- » The total particulate emission rate for the flour mill would not have a significant incremental or cumulative impact at the Shoalhaven Starches site, and would equate to 2.4% of the existing PM₁₀ emission rate, and 1.5% of the existing TSP emission rate.
- » The additional greenhouse gas emissions associated with the proposed flour mill at the existing Shoalhaven site would be 12,567 tCO₂-e per year.
- » The development and rigorous implementation of appropriate environmental management measures throughout the construction period would minimise environmental impacts associated with the construction process.

7.2 Recommendations

It is recommended that:

- » Post-commissioning testing be undertaken to assess the compliance of the Buhler Airjet bag houses with the standard of particulate matter concentration prescribed under the *Protection of the Environment Operations (Clean Air) Regulation 2002*.
- » All appropriate environmental management measures detailed in this report, together with any other environmental management commitments detailed in the Environmental Assessment document be developed in a Construction Environmental Management Plan (CEMP) and implemented throughout the construction phase.



8. Limitations

The following limitations apply to this report:

- » This environmental management report has been prepared for use by Shoalhaven Starches Pty Ltd and Manildra Pty Ltd. GHD accepts no liability for use or interpretation by any person or body other than Manildra.
- » Parts of this report have been based on information provided by Manildra and other organisations. GHD accepts no liability for information provided by other organisations.
- » The advice herein relates only to this project.
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Appendix A

Draft Motor List

New Starch Mill - Nowra

16/12/2006

Motor List (Draft)

Section	Machine			
	Description	Type	Remark	P kW
Wheat intake	Chain conveyor	RFKG-400	CC1	22
1st Cleaning	Auger			7.5
1st Cleaning	Chain conveyor		CC2	7.5
1st Cleaning	Chain conveyor		CC3	7.5
1st Cleaning	Bucket elevator	MGEL-400/240	E1	5.5
1st Cleaning	Transflowtron	MSDG-60		
1st Cleaning	Transflowtron	MSDG-60		
1st Cleaning	Aspirator	MVSG-150		0.18
1st Cleaning	Airlock	MPSN-25/15		0.55
1st Cleaning	Combicleaner	MTKB-120/120		0.6
1st Cleaning	Fan	MHTO-		15
1st Cleaning	Airlock	MPSN-25/15		0.55
1st Cleaning	Trough screw conveyor		SC1	7.5
1st Cleaning	Trough screw conveyor		SC2	5.5
1st Cleaning	Moisture Control	MYFC		
1st Cleaning	Bucket elevator	MGEL-400/240	E2	5.5
1st Cleaning	Water dosing unit	MOZF-2250		
1st Cleaning	Dampener	MOZL-45/150		11
1st Cleaning	Trough screw conveyor		SC3	5.5
2nd Dampening	Vibro discharger	MFVC-160/500	Bin 101	0.25
2nd Dampening	Vibro discharger	MFVC-160/500	Bin 102	0.25
2nd Dampening	Vibro discharger	MFVC-160/500	Bin 103	0.25
2nd Dampening	Vibro discharger	MFVC-160/500	Bin 104	0.25
2nd Dampening	Flow balancer	MZAH-15	Bin 101	
2nd Dampening	Flow balancer	MZAH-15	Bin 102	
2nd Dampening	Flow balancer	MZAH-15	Bin 103	
2nd Dampening	Flow balancer	MZAH-15	Bin 104	
2nd Dampening	Trough screw conveyor		SC4	5.5
2nd Dampening	Bucket elevator	MGEL-320/190	E3	5.5
2nd Dampening	Water dosing unit	MOZF-1000		
2nd Dampening	Paddle screw conveyor		SC5	3
2nd Cleaning	Vibro discharger	MFVC-200	Bin 105	0.25
2nd Cleaning	Flow balancer	MZAH-15	Bin 105	
2nd Cleaning	Trough screw conveyor		SC6	3
2nd Cleaning	Airlock	MPSE-45/45		0.75
2nd Cleaning	Blower			22
2nd Cleaning	Scourer	MHXS-45/80		22
2nd Cleaning	Aspirator	MVSQ-100		4.55
2nd Cleaning	Trough screw conveyor		SC7	4
Screenings handling	Trough screw conveyor		SC8	2.2
Screenings handling	Bucket elevator	MGEL-320/190	E4	5.5
Screenings handling	Plansifter	MPAR-8 HK		0.75
Screenings handling	Vibro discharger	MFVC-125		0.25
Screenings handling	Tube screw conveyor	MNSG-200		2.2
Screenings handling	Hammermill	MJSA-60/18		37
Screenings handling	Airlock	MPSJ-28/30		0.75
Screenings handling	Fan	MHTO-		15
Screenings handling	Weigher	MSDL-80		
Screenings handling	Dosing wheel	MZDG-26/25		0.55

Cleaning aspiration	Airlock	MPSN-25/23	0.55	
Cleaning aspiration	Fan	MHTO-630.21	37	275.18

Mill	Transflowtron	MSDG-60		
Mill	Transflowtron	MSDG-60		
Mill	Rollermill	MDDL-1000/250	1.BK a	37
Mill	Rollermill	MDDL-1000/250	1.BK b	37
Mill	Rollermill	MDDL-1000/250	1.BK c	37
Mill	Rollermill	MDDL-1000/250	1.BK d	37
Mill	Rollermill	MDDL-1000/250	2.BK a	30
Mill	Rollermill	MDDL-1000/250	2.BK b	30
Mill	Rollermill	MDDL-1000/250	2.BK c	30
Mill	Rollermill	MDDL-1000/250	2.BK d	30
Mill	Rollermill	MDDK-1000/250	3.BK a	22
Mill	Rollermill	MDDK-1000/250	3.BK b	22
Mill	Rollermill	MDDK-1000/250	3.BK c	22
Mill	Rollermill	MDDK-1000/250	3.BK d	22
Mill	Rollermill	MDDK-800/250	4.BK a	11
Mill	Rollermill	MDDK-800/250	4.BK b	11
Mill	Rollermill	MDDK-800/250	4.BK c	11
Mill	Rollermill	MDDK-800/250	4.BK d	11
Mill	Rollermill	MDDL-1250/250	C1A a	22
Mill	Rollermill	MDDL-1250/250	C1A b	22
Mill	Rollermill	MDDL-1250/250	C1A c	22
Mill	Rollermill	MDDL-1250/250	C1A d	22
Mill	Rollermill	MDDL-1250/250	C2B a	22
Mill	Rollermill	MDDL-1250/250	C2B b	22
Mill	Rollermill	MDDL-1250/250	C2B c	22
Mill	Rollermill	MDDL-1250/250	C2B d	22
Mill	Rollermill	MDDL-1250/250	C1B a	22
Mill	Rollermill	MDDL-1250/250	C1B b	22
Mill	Rollermill	MDDL-1250/250	C2B a	22
Mill	Rollermill	MDDL-1250/250	C2B b	22
Mill	Rollermill	MDDK-1250/250	C3 a	18.5
Mill	Rollermill	MDDK-1250/250	C3 b	18.5
Mill	Rollermill	MDDK-800/250	C4 a	11
Mill	Rollermill	MDDK-800/250	C4 b	11
Mill	Rollermill	MDDK-800/250	C4 c	11
Mill	Rollermill	MDDK-800/250	C4 d	11
Mill	Rollermill	MDDL-1250/250	C5 a	15
Mill	Rollermill	MDDL-1250/250	C5 b	15
Mill	Rollermill	MDDL-1250/250	C6 a	15
Mill	Rollermill	MDDL-1250/250	C6 b	15
Mill	Impact detacher	MJZF-51-11-3000	DIV.1 a	11
Mill	Impact detacher	MJZF-51-11-3000	DIV.1 b	11
Mill	Impact detacher	MJZE-43-5.5-3000	C1A/C2A a	5.5
Mill	Impact detacher	MJZE-43-5.5-3000	C1A/C2A b	5.5
Mill	Impact detacher	MJZE-43-5.5-3000	C1A/C2A c	5.5
Mill	Impact detacher	MJZE-43-5.5-3000	C1B/C2B a	5.5
Mill	Impact detacher	MJZE-43-5.5-3000	C1B/C2B b	5.5
Mill	Drum detacher	MDL-300G	C3 a	5.5
Mill	Drum detacher	MDL-300G	C3 b	5.5
Mill	Impact detacher	MJZF-51-11-3000	C4 a	11
Mill	Impact detacher	MJZF-51-11-3000	C4 b	11
Mill	Impact detacher	MJZF-51-11-3000	C5/C6 a	11
Mill	Impact detacher	MJZF-51-11-3000	C5/C6 b	11
Mill	Plansifter	MPAK-426		5.5
Mill	Plansifter	MPAK-426		5.5

Mill	Plansifter	MPAG-824		5.5
Mill	Plansifter	MPAG-824		5.5
Mill	Bran finisher	MKLA-45/110	Br.1 a	5.5
Mill	Bran finisher	MKLA-45/110	Br.1 b	5.5
Mill	Bran finisher	MKLA-45/110	Br.1 c	5.5
Mill	Bran finisher	MKLA-45/110	Br.2 a	5.5
Mill	Bran finisher	MKLA-45/110	Br.2 b	5.5
Mill	Bran finisher	MKLA-45/110	Br.3 a	5.5
Mill	Bran finisher	MKLA-45/110	Br.3 b	5.5
Mill	PN-airlock	MPSN-25/23	Group a	2.2
Mill	PN-airlock	MPSN-25/23	Group b	2.2
Mill	PN-airlock	MPSN-25/23	Group c	2.2
Mill	PN-airlock	MPSN-25/23	Group d	2.2
Mill	PN-airlock	MPSN-25/23	Group e	1.5
Mill	PN-airlock	MPSN-25/23	Group f	1.5
Mill	PN-airlock	MPSN-25/23	Group g	1.5
Mill	PN-airlock	MPSN-25/23	Group h	1.5
Mill	Fan	MHTO-	PN a	132
Mill	Airlock	MPSN-25/23	PN a	0.55
Mill	Fan	MHTO-	PN b	55
Mill	Airlock	MPSN-25/23	PN b	0.55
Mill	Fan	MHTO-	Asp.	15
Mill	Airlock	MPSN-25/23	Asp.	0.55
Mill	Blower		Rinsing air	5.5
Mill	Trough Screw Conveyor		Filter Flour	2.2
Mill	Screw feeder	MZMA-100	Filter Flour	1.1
Mill	Vibro feeder	MZVE-330	3.BK A	1197.3

Flour handling	Trough screw conveyor		Flour	5.5
Flour handling	Airlock	MPSH-45/45		1.1
Flour handling	Blower			22
Flour handling	Plansifter	MPAQ-210 HK		1.5
Flour handling	Weigher	MSDL-160		
Flour handling	Dosing wheel	MZDG-33/30		0.55
Flour handling	Fan	MKV-		0.37
Flour handling	Airlock	MPSH-45/45		1.1
Flour handling	Blower	GM-35S		45
				77.12

Millmix handling	Trough screw conveyor		Millmix	5.5
Millmix handling	Weigher	MSDL-160		
Millmix handling	Dosing wheel	MZDG-33/30		0.55
Millmix handling	Fan	MKV-		0.37
Millmix handling	Airlock	MPSH-36/38		1.1
Millmix handling	Blower	GM-25S		22
Millmix handling	Fan	MHTO-	Millmix bin	?
Millmix handling	Vibro discharger	MFVC-160/500	Millmix bin	?
Millmix handling	Tube screw conveyor	MNSG-250	Millmix bin	?
Millmix handling	Fan	MKV-		?
Millmix handling	Airlock			?
Millmix handling	Blower			?
				29.52

Auxillary	Water pump			2.2
Auxillary	Water pump			2.2
Auxillary	Compressed air unit EXISTING			4.4

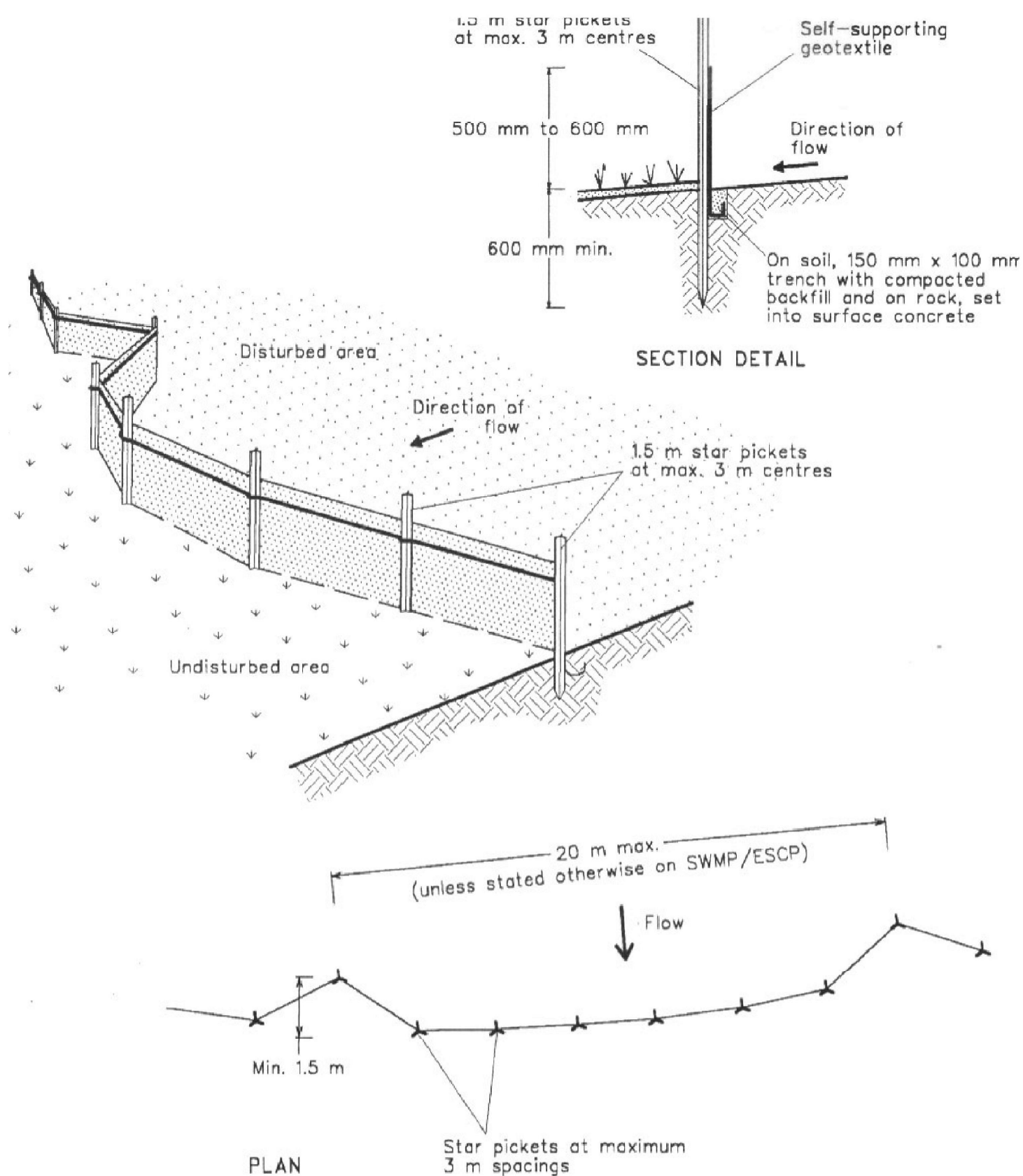
Total kW estimated

1583.5



Appendix B

Erosion and Sediment Control Standard Drawings



Construction Notes

1. Construct sediment fence as close as possible to parallel to the contours of the site.
2. Drive 1.5 metre long star pickets into ground, 3 metres apart.
3. Dig a 150 mm deep trench along the upslope line of the fence for the bottom of the fabric to be entrenched.
4. Backfill trench over base of fabric.
5. Fix self-supporting geotextile to upslope side of posts with wire ties or as recommended by geotextile manufacturer.
6. Join sections of fabric at a support post with a 150 mm overlap.

Data Source*:
NSW Department of Housing
Managing Urban Stormwater :
Soils and Construction (1998)

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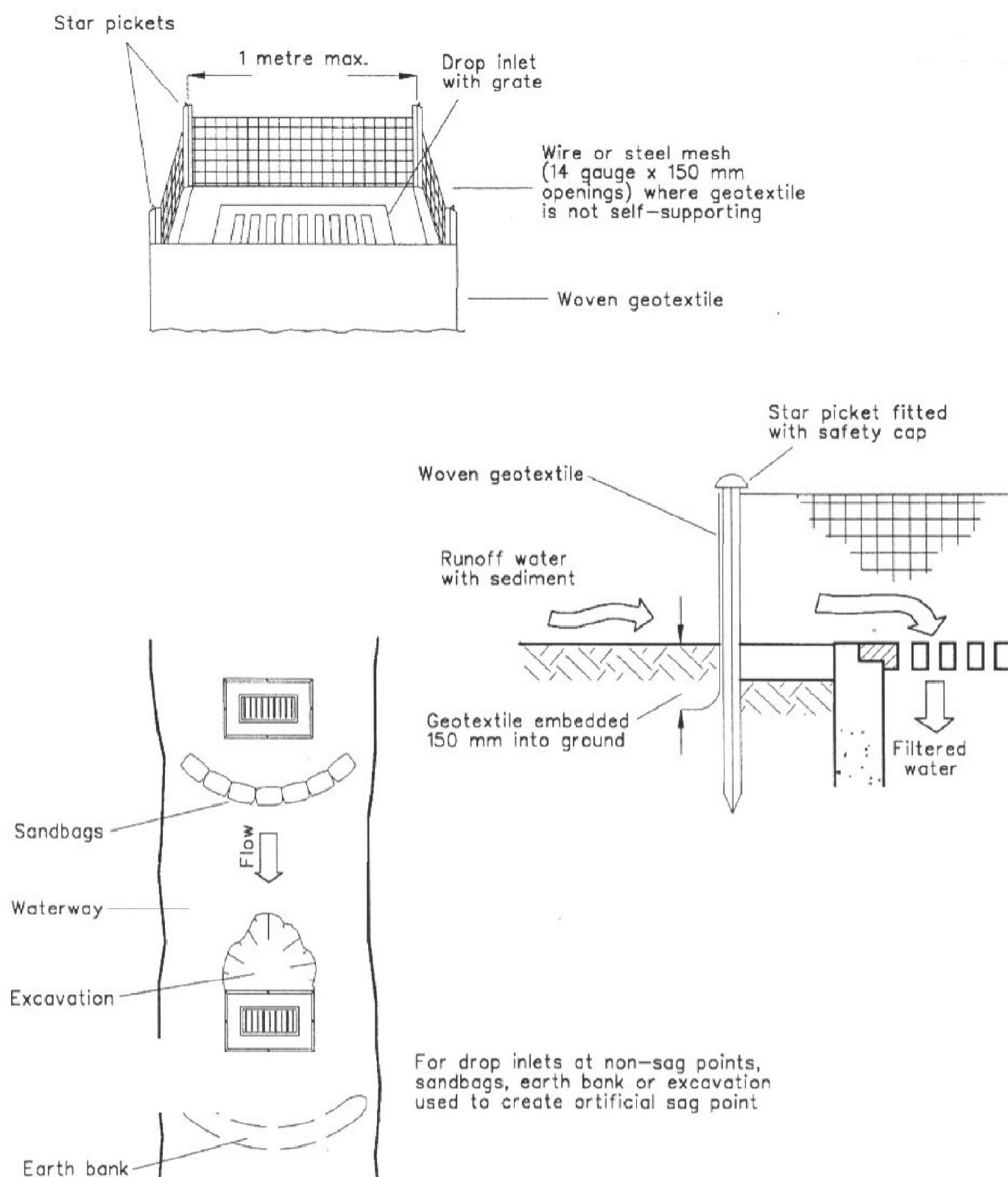
Project: **Short Flour Mill Environmental Assessment**

Sediment Fence (SD 6-7)

Drawing: 23-11907-SD6-7

Original Size: A3

23/03/2007



Construction Notes

1. Fabricate a sediment barrier made from geotextile or straw bales.
2. Support geotextile with mesh tied to posts at 1 metre centres.
3. Do not cover inlet with geotextile.
4. Construction details are similar to Standard Drawing 6-6 and Standard Drawing 6-7.

Data Source*:
NSW Department of Housing
Managing Urban Stormwater :
Soils and Construction (1998)

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Project: **Short Flour Mill Environmental Assessment**

Geotextile Inlet Filter (SD 6-9)

Drawing: 23-11907-SD6-9

Original Size: A3

23/03/2007



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Document Status

Rev No.	Author	Reviewer		Approved for Issue		
		Name	Signature	Name	Signature	Date
1	J Ellaway	M Rodd		M Rodd		23/03/07
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3	J Ellaway	M Rodd		M Rodd		26/04/07