ENVIRONMENTAL ASSESSMENT REPORT

Bio-chemical Prototype Plant

Boyer Mill

Norske Skog Paper Mills (Australia) Ltd

Board of the Environment Protection Authority

May 2016
Environmental Assessment Report

Proponent: Norske Skog Paper Mills (Australia) Ltd
Proposal: Chemical works for the manufacture of an organic solvent
Location: Boyer Mill, 1279 Boyer Rd, Boyer.
NELMS no.: PCE No. 9455/1
Folder: EN-EM-EV-DE-248865
Document.: H537637
Class of Assessment: 2A

Assessment process milestones

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>10/2/16</td>
<td>Section 27 referral received</td>
</tr>
<tr>
<td>11/3/16</td>
<td>EER Guidelines issued</td>
</tr>
<tr>
<td>9/4/16</td>
<td>Start of public consultation period</td>
</tr>
<tr>
<td>23/4/16</td>
<td>End of public consultation period</td>
</tr>
</tbody>
</table>

Acronyms

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Definition</th>
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<tbody>
<tr>
<td>Board</td>
<td>Board of the Environment Protection Authority</td>
</tr>
<tr>
<td>EER</td>
<td>Environmental Effects Report</td>
</tr>
<tr>
<td>DPIPWE</td>
<td>Department of Primary Industries, Parks, Water and Environment</td>
</tr>
<tr>
<td>EIA</td>
<td>Environmental impact assessment</td>
</tr>
<tr>
<td>EMPC Act</td>
<td>Environmental Management and Pollution Control Act 1994</td>
</tr>
<tr>
<td>EMPCS</td>
<td>Environmental management and pollution control system</td>
</tr>
<tr>
<td>EPBC Act</td>
<td>Environment Protection and Biodiversity Conservation Act 1999 (Cth)</td>
</tr>
<tr>
<td>LUPA Act</td>
<td>Land Use Planning and Approvals Act 1993</td>
</tr>
<tr>
<td>LGN</td>
<td>Levoglucosenone (intermediate product in the production of Cyrene)</td>
</tr>
<tr>
<td>RMPS</td>
<td>Resource management and planning system</td>
</tr>
<tr>
<td>SD</td>
<td>Sustainable development</td>
</tr>
<tr>
<td>WWTP</td>
<td>Wastewater treatment plant</td>
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Report summary

This report provides an environmental assessment of Norske Skog’s proposed prototype plant for the production of the organic solvent Cyrene. The proposal involves the manufacture of Cyrene from wood waste within a currently disused building within Norske Skog’s Boyer Mill. Wastewater will be discharged to the Mill’s wastewater treatment plant.

This report has been prepared based on information provided by the proponent in the Environmental Effects Report (EER). Relevant government agencies and the public have been consulted and their submissions and comments considered as part of this assessment.

Further details of the assessment process are presented in section 1 of this report. Section 2 describes the statutory objectives and principles underpinning the assessment. Details of the proposal are provided in section 3. Section 4 reviews the need for the proposal and considers the alternatives to the proposal. Section 5 summarises the public and agency consultation process. The detailed evaluation of environmental issues is contained in section 6. The report conclusions are contained in section 7.

Appendix 1 contains the environment protection notice for the proposal. Attachment 2 of the environment protection notice contains the table of commitments from the EER.

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1 Approval process

As required by section 27(1) of the Environmental Management and Pollution Control Act 1994 (EMPC Act), Norske Skog Paper Mills (Australia) Ltd (Norske Skog) referred the proposal to the Board of the Environment Protection Authority (the Board) on 10 February 2016. The proposal is defined as a ‘level 2 activity’ under clause 1(a)(ii), schedule 2 of the Environmental Management and Pollution Control Act 1994 (EMPC Act), being a chemical works for the manufacture of an organic chemical with a processing capacity of 866 tonnes of raw material (dry equivalent).

The assessment has been undertaken by the Director, Environment Protection Authority under delegation from the Board.

The Board required that information to support the proposal be provided in the form of a Environmental Effects Report (EER).

Several drafts of the EER were submitted to the Department for comment prior to its finalisation and acceptance on behalf of the Board. The EER was released for public inspection for a 14-day period commencing on 9 April 2016. An advertisement was placed in the Mercury newspaper and a notice was placed on the EPA website. No public submissions were received.

2 SD objectives and EIA principles

The proposal must be considered by the Director in the context of the objectives of the Resource Management and Planning System of Tasmania (RMPS), and in the context of the objectives of the Environmental Management and Pollution Control System (EMPCS) (both sets of objectives are specified in Schedule 1 the EMPC Act). The functions of the Board are to administer and enforce the provisions of the Act, and in particular to use its best endeavours to further the RMPS and EMPCS objectives.

The Director must undertake the assessment of the proposal in accordance with the Environmental Impact Assessment Principles defined in Section 74 of the EMPC Act.
3 The proposal

Norske Skog proposes to operate a prototype chemical plant for the production of the solvent Cyrene. The prototype plant is to develop commercial viability and demonstrate feasibility of large scale production. It is proposed to operate the plant for 2 to 3 years. If the prototype plant is successful Norske Skog will seek to develop a permanent large scale plant (1000 to 10,000 tonnes per annum of Cyrene production). Initially, imported softwood (*pinus radiata*) sawdust is to be used as the feedstock. In the medium term the proponent hopes that wood-waste produced by Norske Skog’s mill can be used as the feedstock.

The production process involves the conversion of cellulose via the intermediate product Levoglucosenone (LGN) to Cyrene. Chemical structures of these materials are shown in Figure 1.

![Figure 1: Structure of Cyrene and its precursor Levoglucosenone (LGN)](image)

A process flow diagram is shown in Figure 2. The first production step is a chemi-mechanical process in which the raw material is pyrolysed using phosphoric acid in a sulfolane solvent mix. The reaction produces a vapour phase containing the solvent and LGN product and a solid residue called ‘biochar’. As detailed in section 3.5.2 of the EER, biochar is predominantly carbon with a minor ash component. Phosphoric acid will remain in the biochar. Biochar is to be initially burnt in the main Mill boiler. The proponent has stated that Biochar is potentially a high value product for use in soil conditioning and remediation and its commercial potential is to be investigated during plant operation.

The vapour phase is then condensed and distilled into separate streams these being:
1. Sulfolane which is recycled.
2. LGN to be further processed to Cyrene.
3. Wastewater containing other waste condensates to be discharged to the mill’s wastewater treatment plant (WWTP).

The last step in the production process is a batched solvent-less hydrogenation of LGN to Cyrene using hydrogen gas in the presence of a catalyst. The catalyst remains functional for about 10 cycles. Waste catalyst is returned to the supplier for regeneration and reuse.
Figure 2: Process flow diagram for the production of Cyrene.

The main characteristics of the proposal are summarised in Table 1. A detailed description of the proposal is provided in Section 2 of the EER.

Table 1: Summary of the proposal’s main characteristics

<table>
<thead>
<tr>
<th>Activity</th>
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<tbody>
<tr>
<td>A prototype chemical plant for the production of 50 tonnes per annum of the solvent Cyrene from wood waste with a processing capacity of 866 dry tonnes of wood waste.</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Location and planning context</th>
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<tbody>
<tr>
<td>Location</td>
</tr>
<tr>
<td>Land zoning</td>
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<tr>
<td>Land tenure</td>
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<table>
<thead>
<tr>
<th>Existing site</th>
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<tbody>
<tr>
<td>Land Use</td>
</tr>
<tr>
<td>Building construction</td>
</tr>
<tr>
<td>Topography</td>
</tr>
<tr>
<td>Ground</td>
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<table>
<thead>
<tr>
<th>Local region</th>
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<tbody>
<tr>
<td>Climate</td>
</tr>
<tr>
<td>Surrounding land zoning, tenure and uses</td>
</tr>
</tbody>
</table>
### Proposed infrastructure

<table>
<thead>
<tr>
<th>Specification</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Major equipment</strong></td>
<td>Plant consists of a reactor vessel with feed system and separator, a series of condensers and separation columns and a hydrogenation vessel.</td>
</tr>
<tr>
<td><strong>Other site infrastructure</strong></td>
<td>Plant and chemical storage is to be located within a bund.</td>
</tr>
</tbody>
</table>

### Inputs

<table>
<thead>
<tr>
<th>Type</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Water</strong></td>
<td>&lt;35 kg/hr water</td>
</tr>
<tr>
<td><strong>Energy</strong></td>
<td>Electrical and steam (&lt;900kg/hr recirculated to the mill)</td>
</tr>
</tbody>
</table>
| **Other raw materials**               | Softwood sawdust: 17-18 tonnes per week  
Sulfolane: <30 tonnes per annum  
Phosphoric acid: <45 tonnes per annum  
Hydrogen gas: < 1 tonne per annum |

### Wastes and emissions

<table>
<thead>
<tr>
<th>Type</th>
<th>Details</th>
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</thead>
<tbody>
<tr>
<td><strong>Liquid</strong></td>
<td>12 tonnes per week wastewater discharged to the Mill wastewater treatment plant (WWTP)</td>
</tr>
<tr>
<td><strong>Atmospheric</strong></td>
<td>Biochar is to be burnt in the Mill boiler No. 5</td>
</tr>
<tr>
<td><strong>Solid</strong></td>
<td>10-12 tonnes per week of biochar</td>
</tr>
<tr>
<td><strong>Controlled wastes</strong></td>
<td>Section 3.11 of the EER indicates waste chemicals may be generated.</td>
</tr>
<tr>
<td><strong>Noise</strong></td>
<td>Attachment 5 of the EER indicates sound will be generated by motors associated with the main reactor and ancillary equipment, and vacuum pumps.</td>
</tr>
<tr>
<td><strong>Greenhouse gases</strong></td>
<td>Section 3.13 of the EER states the plant has a moderate electricity demand, which in Tasmania is generated mainly from hydroelectric sources. Biochar will be burnt in the boiler. This will displace coal use. Additional transport will generate some greenhouse gas emissions.</td>
</tr>
</tbody>
</table>

### Construction, commissioning and operations

<table>
<thead>
<tr>
<th>Specification</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Proposal timetable</strong></td>
<td>Commencement of construction and commissioning is not discussed in the EER. It is intended to operate the plant for 2-3 years to prove commercial viability of a full scale plant.</td>
</tr>
<tr>
<td><strong>Operating hours (ongoing)</strong></td>
<td>The plant may be operated 24 hours per day 7 days per week</td>
</tr>
</tbody>
</table>

### Other key characteristics

Section 3.11 of the EER notes plant chemical stocks are to be kept separate from Mill chemical stocks. The Mill will provide some services, these being listed as steam, filtered water and small amounts of air. The plant will discharge wastewater and biochar to the mill. Steam condensate will be recycled.
Figure 3: Boyer Mill location showing land owned by Norske Skog (blue hash) and nearest residences and (green dots).
Figure 4: Boyer Mill showing location of the proposal site (marked Salt Store)
4 Need for the proposal and alternatives

The proponent discusses the uses of Cyrene and opportunities for markets in section 1 and on page 11 of the EER.

Cyrene is an aprotic solvent described as non-toxic with similar properties to the currently used solvent, N-Methylpyrrolidone (NMP). It is reported that NMP and other existing aprotic solvents have been recognised by European regulatory agencies as “Substances of Very High Concern”. 3 of the 4 major aprotic solvents have been earmarked by the European Parliament to be banned. There are however virtually no replacements for such substances available. The EER states that the proponent has had information from major European pharmaceutical companies that Cyrene is the only solvent in development with the necessary chemical properties to replace one or more of the solvents of concern.

The rationale for the proposal to be located at the Mill is detailed in section 2.5 of the EER. The reasons posited include:

- Support from government and businesses.
- Potential for proponent to change business at the site to bio-chemical manufacture.
- Synergy with the existing business at the Mill
- Extensive operations and project management capability at the Mill.
- Key support infrastructure is available at the site.

5 Public and agency consultation

No public representations were received.

The Department of Health and Human Services commented on the proposal information and draft guidelines. DHHS recommended the impact of wastewater from the proposal on the Mill WWTP be monitored.

The following EPA Specialists were consulted during the preparation of the Report:

- Water Specialist
- Industrial Air Emissions Specialist
- Industrial Operations Regulatory Officer
- Noise Specialist
6 Evaluation of environmental issues

The environmental issues considered relevant to the proposal have been evaluated by the EPA Division. Details of this evaluation, along with the permit conditions required by the Director, are discussed below.

Due to the complexity of the issue, management of the proposal wastewater is evaluated in more detail. Other issues are evaluated in tabular form following this evaluation.

**Issue 1  Wastewater Management**

*Description of potential impacts*

An Emission Characterisation and Monitoring Plan (ECMP) is included as Attachment 3 of the EER. A summary of potential impacts and mitigation measures is provided in Section 3.6 of the EER.

**Mill WWTP treatment process**

It is proposed to discharge wastewater to the Mill WWTP via the No. 3 Thermo-mechanical Pulp Plant effluent drain. Discharge will be from a buffer tank with a 12hr holding capacity. The Mill WWTP is described in section 2.4.2 of the EER. The process consists of a primary clarifier, an integrated biofilm and activated sludge reactor (BAS) and a secondary clarifier. The BAS system is designed to promote rapid microbial breakdown of colloidal and dissolved organic material.

The WWTP treated 21.1 ML/d of Mill wastewater in 2015. The Cyrene plant is estimated to generate <0.0003 ML/d. It is concluded this will not affect the hydraulic capacity of the WWTP.

The ECMP provides an analysis of potential wastewater constituents, their biodegradability and potential residual toxicity. This is based on benchtop scale data and scaling using a mass balance model.

**Wastewater constituents**

554kg of dissolved constituents are estimated to be discharged in wastewater each day. The following compound classes, with their estimated mass percentage in effluent, are detailed in the ECMP:

- Acetic acid and other short chain carboxylic acids (48%)
- Sulfolane (25%)
- A range of cyclic non-aromatic compounds of which furfural is the dominant species (9% furfural +2% others)
- Unrecovered LGN (3%) and Cyrene (10%) products.
- Oligomers of LGN (3%)
- Short chain C-O compounds (eg formaldehyde) and aromatic compounds represent <1% of the constituents.
It is argued that under the low temperature conditions of the cellulose pyrolysis PAHs are not expected. This is supported by analysis of the biochar residual (see “Issue 2” of this report).

**Biodegradability**

The ECMP presents the results of a literature search on the biodegradability of reference compounds for each wastewater constituent compound class. On the basis of this literature survey it was determined that all constituents likely present will be readily biodegradable with conservative mass reductions of 90-99%.

**Residual toxicity**

The ECMP estimates residual toxicity of the reference compounds at the estimated concentrations in Mill WWTP treated effluent by comparison with available literature toxicity data for a range of organisms. The only compound where a literature LC50 \(^1\) value was found close to the reference treated effluent concentration was phenol where the LC50 for a prawn species was 5.5 µg/L (reference concentration = 3µg/L). It is argued that this is an isolated result as for another similar species the LC50 was 70 times higher.

There is no published data for the products LGN and Cyrene. The ECMP states that extensive and as yet unpublished toxicity testing of Cyrene by Hoffman La Roche suggest low toxicities compared with many other industrial solvents. The data is presented in Attachment 1 of the EER.

**Conclusions**

The EER concludes that:

“The high water solubility, amenability to degradation by aerobic biological treatment, lack of any environmentally significant hetero-atoms (e.g. chlorine, nitrogen, sulfur and phosphorous) means that bioaccumulation of the treated FC5 Plant wastewater components is extremely unlikely to occur. These same properties also mean that the compounds are unlikely to adsorb to particulate matter (e.g. fibre) present in the treatment system, hence making it highly unlikely that any significant quantity of these compounds will exit the mill via sold residues.”

**Management measures**

The following comments made by the proponent are relevant:

**Commitment 5** - The reagents, process and wastes generated will be routinely monitored.

**Commitment 6** - A benchtop wastewater process will be constructed and operated.

**Commitment 7** – Benchtop treated wastewater will be characterised. Should evaluation identify compounds of concern then relevant toxicity testing may be undertaken.

**Commitment 8** – A report detailing the result of effluent characterisation and impact evaluation will be provided to the Director within 6 months of commencement of commissioning.

**Public and agency comment and responses**

DHHS recommended monitoring of the impact of effluent form the activity on the Mill WWTP be undertaken to confirm there is no measurable change to effluent quality from the WWTP discharged to the Derwent River.

The EPA Division Water Specialist agreed with the findings of the ECMP.

\( ^1 \) LC50 is the lethal concentration of the compound required to kill 50% of the relevant species.
**Evaluation**

The evaluation of potential contaminants presented in the ECMP is comprehensive. On the basis of this information it is accepted that the water soluble wastes generated will likely be readily biodegradable using the Mill WWTP. The potential impact on the WWTP of the hydraulic and contaminant loads discharged by the activity is not considered significant, provided the WWTP is fully operational. Condition **EF1** restricts the effluent discharge location to the Mill WWTP only. The condition requires cessation of discharge during periods where the WWTP is not fully operational.

Discharge volumes are restricted by condition **EF2** to 3.2kL per day. This ensures any potential for a shock load being discharged to the WWTP is prevented. The presence of a balance tank with a 12hr residence time is considered sufficient to ensure discharge volumes under normal operation conditions can be managed without impact upon Cyrene production.

The proposal is to operate the first ongoing Cyrene production plant globally. The plant is a prototype to prove commercial viability and refine the production process. During plant operation, ongoing process monitoring and adjustment will be occurring. As part of this program the proponent will also be directly investigating effluent characteristics and evaluating treatment efficacy (Commitments **5, 6 and 7**). It is considered that part of proving ongoing viability of the operation is to ensure the effluent can be managed.

The proponent’s commitment to provide a report to the Director detailing the results of the above works (Commitment **8**) is supported and required by Condition **EF3**. The condition allows 6 months from the commencement of commissioning of the plant for the provision of the report. It is considered that the ECMP included as part of the EER provides sufficient information to demonstrate that in the short term the risk to the WWTP and WWTP receiving environment due to operation of the proposed plant is negligible.

Estimates of concentrations of contaminants in combined influent to the WWTP and in treated effluent from the WWTP are listed in Table 2 of the ECMP. The highest concentrations for individual contaminants are 6.8 and 0.7 mg/L for Sulfolane in influent and effluent respectively and 2.6 and 0.3 mg/L for furfural in these streams. Most contaminants are however in concentrations 2 orders of magnitude lower. The proponent argues that the concentrations of contaminants are generally below the limit of detection using currently available analytical techniques and thus it would not be possible to directly evaluate biodegradability of effluent components within the WWTP system. This argument is accepted.

DHHS recommended monitoring of the impact of effluent on the WWTP. It is considered that although direct monitoring of the impact of effluent on the WWTP in not proposed as part of the proponent’s ECMP, the requirement for a revised ECMP to be submitted, in which is to be included the results of benchtop investigations of effluent biodegradability (condition **EF3**), satisfies DHHS’s recommendation.
Conclusions

The proponent is required to comply with the following general conditions,

G1 Access to and awareness of conditions.
G2 Incident response.
G3 Notification prior to commissioning.

The proponent is required to comply with the following specific conditions:

EF1 Effluent discharge locations.
EF2 Maximum effluent discharge volume.
EF3 Effluent emissions characterisation and monitoring plan.

In addition, as detailed in information clause IO3 the proponent has a general environmental duty to comply with commitment numbers 5, 6, 7 and 8.

Other Issues

<table>
<thead>
<tr>
<th>Issue 2: Solid waste</th>
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<tbody>
<tr>
<td><strong>Description of potential impacts</strong></td>
</tr>
<tr>
<td>The proposal will generate a bulk solid residue from the pyrolysis process called biochar. The EER states that biochar is a potential high value soil remediation product. Biochar however is initially to be burnt in the main Mill boiler, this being the No. 5 boiler. The boiler operation described in section 2.4 of the EER. Six monthly stack emission monitoring data is supplied for 2013 to 2015. These show that the particulate, sulphur dioxide and nitrous oxides levels are within limits specified in the Environment Protection Policy (Air Quality) 2004. A total of 10-12 tonnes of biochar are to be burnt each week. The quantity of coal burnt each week is reported as 1800 tonnes. Analytical results of biochar generated by the benchtop scale process are provided. This analysis found the material consisted of 71.1% carbon with an ash content of 6.4% @815°C. Polyaromatic hydrocarbon levels were below the limit of reporting, except for naphthalene at 3.3ppb. The EER notes that the biochar will contain waste phosphoric acid but is not expected to contain sulfolane because at the temperature biochar is formed sulfolane will remain in vapour form. The proponent concludes that given the analysis of biochar and the very low proportional volume to be burnt, any potential differences in stack emission characteristics will be indistinguishable from normal variation. The impact of biochar on boiler ash characteristics is discussed in section 3.7 of the EER. It is concluded that very minor amounts of phosphorous will be added to the ash (0.046%). Otherwise impacts will be negligible.</td>
</tr>
</tbody>
</table>
Management measures proposed in EER

The following commitments are made in the EER:

**Commitment 3** – Biochar samples to be collected for analysis 3 monthly in the first year then 6 monthly thereafter.

**Commitment 4** – Boiler stack testing during burning of biochar to be conducted within 3 months of commencement of operations.

**Commitment 9** – Ongoing analysis of boiler ash to be carried out 3 monthly for 1 year then 6 monthly.

Public and agency comment

The industrial air emissions specialist accepted the proponent’s conclusion that boiler stack emissions would not likely be impacted by the burning of biochar.

Evaluation

Biochar is the residue from low temperature pyrolysis of wood (sawdust) using phosphoric acid. The proponent argues that the material is unlikely to contain significant quantities of polyaromatic hydrocarbons due to the relatively low reaction temperature. Although raw analytical data is not provided the proponent’s conclusions are accepted.

It is noted that no chlorine containing compounds are used in process and thus there is no potential for elevated emissions of chlorinated dioxins and similar chemicals of concern.

It is considered that the biochar generated is a suitable fuel source for use in the Mill number 5 boiler for the following reasons:

- It is generated directly from the pyrolysis of wood only.
- The only contaminant it is likely to contain in any quantity is waste phosphoric acid. This will only add minor phosphorus to boiler ash.
- The quantity of material in comparison to the total quantity of fuel burnt in the boiler is not significant.
- The boiler is significant in size with high operating temperatures and long fuel residence times, leading to efficient fuel consumption.
- Boiler emissions comply with the Air EPP.

The proponent has committed to analysis of biochar, stack emission testing and analysis of boiler ash. These works are important for proper characterisation of the waste material and management of the boiler. Sufficient information in relation to the proposed process which generates the biochar has however been supplied in the EER to conclude that the material can be used as a fuel in the Mill no.5 boiler without impacting on the operation of that boiler. Thus there are no management requirements imposed except a restriction to dispose of biochar in the identified boiler (Condition WM1).

Other uses for the material, such as use as a soils conditioner could be considered by the Director, under this condition, should the appropriate information be provided.

Conclusion

The proponent is required to comply with condition WM1

In addition, as detailed in information clause IO3 the proponent has a general environmental duty to comply with commitment numbers 3, 4, and 9.
## Issue 3: Hazardous materials management and stormwater protection

### Description of potential impacts

Should untreated substances from the proposed operation discharge to stormwater the potential exists for these substances to reach and impact upon the Derwent River. Waste chemical must be disposed of appropriately to avoid potential environmental impacts.

Stormwater impacts are discussed in section 3.2 of the EER and hazardous materials management is discussed in section 3.11 of the EER. The proponent concludes that as long as substances are contained in the Salt Store the risks of materials entering the stormwater are low. The salt store currently has 3 internal drains.

### Management measures proposed in EER

The following commitments are made in the EER:

**Commitment 1** – Drains are to be sealed and spill barriers are to be installed in the main entrances to the salt store. Internal plant processing equipment is to be bunded.

**Commitment 2** – Dedicated spill kits are to be maintained in appropriate places.

**Commitment 13** – Registered waste contractors are to be used for chemical disposal.

**Commitment 14** – Empty reagent containers such as IBCs to be returned to suppliers.

### Public and agency comment

None.

### Evaluation

The salt store is roofed and constructed of solid concrete. The commitment (1) to bund both process equipment and site entrance ways is appropriate and will effectively isolate the site from stormwater. Commitment 2, 13 and 14 are in accordance with best practice environmental management principles.

Standard hazardous materials requirements in relation to storage of small quantities (Condition H1) and use of spill kits (condition H3) are imposed. Condition H2 imposes more detailed requirements regarding storage and handling of bulk substances and includes requirements to conduct processing operations within a bunded area.

Condition SW1 requires that stormwater is prevented from entering the site and any spilled materials are prevented from leaving the site (except for disposal).

The use of approved transporters for the transport of controlled wastes is required by the *Environmental Management and Pollution Control (Waste Management) Regulations 2010*. No additional restrictions are merited.

### Conclusion

The proponent is required to comply with the following standard conditions H1 and H3 and with specific conditions H2 and SW1.

In addition, as detailed in information clause IO3 the proponent has a general environmental duty to comply with commitment numbers 1 and 2.
### Issue 4: Incident Management

#### Description of potential impacts

The proposed process involves the use of pressure vessels and a potentially explosive gas (hydrogen). The process will use and also generate heat. Bulk chemicals will also be used and stored onsite (particularly sulfolane). In addition the proposal is dependent on the operation of the surrounding Mill for steam and water, and to enable disposal of wastes.

#### Management measures proposed in EER

Incident management is not addressed specifically, nevertheless a number of management measures discussed in the EER are relevant:

- Norske Skog maintains an externally accredited EMS certified under ISO14001.
- In the event of power failure plant equipment will safely fail in a closed state and production will immediately cease.
- The plant is designed with sufficient internal storage to contain the entire process contents.
- As discussed above, all process equipment and the site itself is to be bunded.
- Wastewater can be contained in a buffer tank with a 12hr capacity.
- Mill induction processes include procedures for responding to and reporting environmental incidents.
- **Commitment 12** – environmental incidents to be recorded.

#### Public and agency comment

None

#### Evaluation

The proposed site is located in the approximate centre of a large industrial complex in an enclosed concrete constructed building. Surfaces are to be sealed and the site and process equipment is to be bunded. It is accepted that there are overall Mill site management processes and controls that mitigate the potential risk of a significant incident at the Mill and where such an incident occurs the potential for it to cause environmental harm.

Relevant conditions imposed include those in relation to hazardous waste management above. It is considered that even if a catastrophic incident occurred the risk of serious or material environmental harm being caused through the emission of pollutants to land air or water is low. No additional conditions are considered merited.

#### Conclusion

The proponent is required to comply with the conditions listed in relation to “Issue 3” of this report.

In addition, as detailed in information clause **IO3** the proponent has a general environmental duty to comply with commitment number **12**.
### Issue 5: Noise

**Description of potential impacts**

The site is located within an operating woodchip and pulp and paper mill site. Significant sources of noise in the surrounding area are listed in section 3.8 of the EER and include, wood delivery, shipping, pulping, paper making machinery, conveyors, paper storage areas, rail and the operation of the boiler and WWTP. Most of these sources of noise are continuous. Data is provided in relation to noise surveys at nearby residences in 2013 and 2014, the nearest resident being at 580m from the proposal site. These surveys show that at both daytime and night time noise levels comply with the Mill’s current regulatory limits.

All noise generating equipment associated with the proposal is to be contained within the salt store site. A preliminary noise assessment is provided as attachment 5 to the EER. Based upon extrapolation of estimated sound power levels of equipment within the shed, noise levels at the nearest resident resulting from the proposed operation are estimated at less than 25dB(A). This is well below the reported background level and current Mill noise emissions.

**Management measures proposed in EER**

The following commitments are made in the EER:

**Commitment 10** – Within 6 months if commencement of operation actual plant sound power levels are to be measured and the noise model updated accordingly.

**Commitment 11** – If necessary control measures will be implemented.

**Public and agency comment**

The EPA Noise Specialist had no additional comments.

**Evaluation**

The commitments represent best practice environmental management measures for assessing and mitigating potential noise sources. The noise assessment provides estimated sound power levels for 2x300kW motors, 3 vacuum pumps and a number of small motors associated with ancillary equipment. Given the nature of the noise generating equipment, their location within a concrete construction, the surrounding noise environment and the distance to the nearest residences, no noise conditions are considered merited.

**Conclusion**

No conditions in relation to noise are imposed.

In addition, as detailed in information clause IO3 the proponent has a general environmental duty to comply with commitment numbers 10 and 11.
### Issue 6: Transport

**Description of potential impacts**

Section 3.9 of the EER discussed transport impacts. Current vehicle movements for raw material and products to and from the Mill are estimated as 23,100 per year. The worst case number of vehicle movements as a result of the proposal is estimated at 75. General deliveries and light vehicle traffic volume to and from the Mill or the proposal site directly is not estimated. It is considered that additional vehicle movement are negligible compared to current movements and will not result in any significant additional off-site impacts.

**Management measures proposed in EER**

None.

**Public and agency comment**

None.

**Evaluation**

The proponent’s assessment is supported.

**Conclusion**

No conditions are imposed.

### Issue 7: Decommissioning and Rehabilitation

**Description of potential impacts**

Proper decommissioning of equipment is necessary to ensure any hazardous residues are appropriately managed.

**Management measures proposed in EER**

The EER states that a decommissioning and rehabilitation plan (DRP) will be produced in the event of total Mill closure. In relation to the activity equipment will first be assessed for repurposing, then recycling and finally disposal to landfill or to an appropriate waste treatment facility.

**Public and agency comment**

None.

**Evaluation**

The proposed decommissioning sequence is consistent with the waste management hierarchy. Standard conditions requiring notification of cessation of operations (DC1), the preparation a DRP (DC2), implementation of that DRP (DC3) and proper management during any temporary suspension of the activity (DC4) are imposed.

**Conclusion**

The proponent is required to comply with standard conditions: DC1, DC2, DC3, and DC4.
7 Report conclusions

This assessment has been based on the information provided by the proponent, Norske Skog Paper Mills (Australia) Ltd, in the EER.

This assessment has incorporated specialist advice provided by EPA Division scientific specialists and regulatory staff.

It is concluded that:

1. the RMPS and EMPCS objectives have been duly and properly pursued in the assessment of the proposal; and
2. the assessment of the proposed activity has been undertaken in accordance with the Environmental Impact Assessment Principles.

It is concluded that the proposed activity is capable of being managed in an environmentally acceptable manner such that it is unlikely that the objectives of the Environmental Management and Pollution Control Act 1994 (the RMPS and EMPCS objectives) would be compromised, provided that the environment protection notice appended to this report is issued and served and its requirements are duly complied with.

8 Report approval

Environmental Assessment Report and conclusions, including permit conditions, adopted:

Wes Ford
DIRECTOR, ENVIRONMENT PROTECTION AUTHORITY
Acting under delegation from the Board of the Environment Protection Authority

Date: 27 May 2016
9 References


10 Appendices

Appendix 1 Environment protection notice No. 9455/1
ENVIRONMENT PROTECTION NOTICE No. 9455/1

Issued under the Environmental Management and Pollution Control Act 1994

Issued to:
NORSKE SKOG PAPER MILLS (AUSTRALIA) LIMITED
ACN 009 477 132
LEVEL 9, 59 - 61 GOULBURN ST
SYDNEY NSW 2000

Environmentally relevant activity:
The operation of bio-chemical pilot plant (ACTIVITY TYPE: Chemical works processing organic chemical or chemical product or petrochemical works not discharging all wastewater to external approved Wastewater Treatment Works.)
BOYER PULP AND PAPER MILL, BOYER RD
BOYER TAS 7140

GROUNDS

I, Wes Ford, Director, Environment Protection Authority, (the Director), being satisfied in accordance with section 44(1)(a) of the Environmental Management and Pollution Control Act 1994 (EMPCA) that in relation to the above-mentioned environmentally relevant activity that serious or material environmental harm or environmental nuisance is being, or is likely to be, caused hereby issue this environment protection notice to the above-mentioned person as the person responsible for the activity.

PARTICULARS

The particulars of the grounds upon which this notice is issued are:

1. The above activity, being an environmentally relevant activity which does not require a land use permit, was required to be referred to the EPA under Section 27 of the EMPCA for environmental impact assessment. Having completed its assessment, the Board of the EPA has caused the Director to issue this environment protection notice containing conditions and restrictions which the Board requires to apply to the activity.

DIRECTOR, ENVIRONMENT PROTECTION AUTHORITY

Date of issue: 27 MAY 2016
DEFINITIONS

Unless the contrary appears, words and expressions used in this Notice have the meaning given to them in Schedule 1 of this Notice and in the EMPCA. If there is any inconsistency between a definition in the EMPCA and a definition in this Notice, the EMPCA prevails to the extent of the inconsistency.

REQUIREMENTS

The person responsible for the activity must comply with the conditions as set out in Schedule 2 of this Notice.

INFORMATION

Attention is drawn to Schedule 3, which contains important additional information.

PENALTIES

If a person bound by an environment protection notice contravenes a requirement of the notice, that person is guilty of an offence and is liable on summary conviction to a penalty not exceeding 1000 penalty units in the case of a body corporate or 500 penalty units in any other case (at the time of issuance of this Notice one penalty unit is equal to $154.00).

NOTICE TAKES EFFECT

This notice takes effect on the date on which it is served upon you.

APPEAL RIGHTS

You may appeal to the Appeal Tribunal against this notice, or against any requirement contained in the notice, within 14 days from the date on which the notice is served, by writing to:

The Chairperson
Resource Management and Planning Appeal Tribunal
GPO Box 2036
Hobart TAS 7001

Signed: [Signature]

DIRECTOR, ENVIRONMENT PROTECTION AUTHORITY

Date: 27 May 2016

DIRECTOR, ENVIRONMENT PROTECTION AUTHORITY
Date of issue: 27 May 2016
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**Attachments**

Attachment 1: The Land (modified: 18/05/2016 10:14). .................................................. 1 page
Attachment 2: Commitments (modified: 23/05/2016 11:36). ........................................... 2 pages
Schedule 1: Definitions

Activity means any environmentally relevant activity (as defined in Section 3 of EMPCA) to which this document relates, and includes more than one such activity.

Biochar means the solid waste generated by the activity as a result of the chemi-mechanical pyrolysis of raw materials processed.

Commissioning means the testing of major items of equipment and is taken to be completed when the item(s) are being used or operated in the course of normal commercial operations.

DRP means Decommissioning and Rehabilitation Plan.


Effluent means wastewater discharged from The Land.

EMPCA means the *Environmental Management and Pollution Control Act 1994*.

Environmental Harm and Material Environmental Harm and Serious Environmental Harm each have the meanings ascribed to them in Section 5 of EMPCA.

Environmental Nuisance and Pollutant each have the meanings ascribed to them in Section 3 of EMPCA.

Environmentally Hazardous Material means any substance or mixture of substances of a nature or held in quantities which present a reasonably foreseeable risk of causing serious or material environmental harm if released to the environment and includes fuels, oils, waste and chemicals but excludes sewage.

Lignocellulosic Material means wood derived materials such as sawdust, wood chips or wood pulp and includes wood byproduct or wood waste streams generated by a woodchip mill or pulp and paper mill.

Person Responsible is any person who is or was responsible for the environmentally relevant activity to which this document relates and includes the officers, employees, contractors, joint venture partners and agents of that person, and includes a body corporate.

The Land means the land on which the activity to which this document relates may be carried out, and includes: buildings and other structures permanently fixed to the land, any part of the land covered with water, and any water covering the land. The Land is within the Boyer Mill site, this being at address 1279 Boyer Rd, Boyer, Tasmania 7140, The Land specifically being within the area shown at Attachment 1 and delineated by corner coordinates: 508449E 5263774N, 508473E 5263783N, 508486E 5263751N, 508463E 5263742N.

The Mill means the pulp and paper mill located at 1279 Boyer Rd, Boyer, Tasmania, operating pursuant to Derwent Valley Council Planning Permit Number 3411.

Wastewater means spent or used water (whether from industrial or domestic sources) containing a pollutant and includes stormwater which becomes mixed with wastewater.
Schedule 2: Conditions

Maximum Quantities

Q1 Regulatory limits
   1 The activity must not exceed the following limits (annual fees are derived from these figures):
      1.1 866 tonnes per year of processing capacity.
      1.2 866 tonnes per year of processing capacity means 866 dry tonnes equivalent of lignocellulosic material.

General

G1 Access to and awareness of conditions and associated documents
   A copy of these conditions and any associated documents referred to in these conditions must be held in a location that is known to and accessible to the person responsible for the activity. The person responsible for the activity must ensure that all persons who are responsible for undertaking work on The Land, including contractors and sub-contractors, are familiar with these conditions to the extent relevant to their work.

G2 Incident response
   If an incident causing or threatening environmental nuisance, serious environmental harm or material environmental harm from pollution occurs in the course of the activity, then the person responsible for the activity must immediately take all reasonable and practicable action to minimise any adverse environmental effects from the incident.

G3 Notification prior to commissioning
   At least 14 days prior to the commencement of commissioning of the activity, the person responsible for the activity must notify the Director of the date on which commissioning is expected to commence.

Decommissioning And Rehabilitation

DC1 Notification of cessation
   Within 30 days of becoming aware of any event or decision which is likely to give rise to the permanent cessation of the activity, the person responsible for the activity must notify the Director in writing of that event or decision. The notice must specify the date upon which the activity is expected to cease or has ceased.

DC2 DRP requirements
   Unless otherwise approved in writing by the Director, a Decommissioning and Rehabilitation Plan (DRP) for the activity must be submitted for approval to the Director within 30 days of the Director being notified of the planned cessation of the activity or by a date specified in writing by the Director. The DRP must be prepared in accordance with any guidelines provided by the Director.

DC3 Implementation of the DRP
   Following permanent cessation of the activity, the decommissioning of the activity and the rehabilitation of The Land must be carried out in accordance with the most recent Decommissioning and Rehabilitation Plan (DRP) approved by the Director, as may be amended from time to time with written approval of the Director.
DC4 Temporary suspension of activity

1 Within 30 days of becoming aware of any event or decision which is likely to give rise to the temporary suspension of the activity, the person responsible for the activity must notify the Director in writing of that event or decision. The notice must specify the date upon which the activity is expected to suspend or has suspended.

2 During temporary suspension of the activity:
   2.1 The Land must be managed and monitored by the person responsible for the activity to ensure that emissions from The Land do not cause serious environmental harm, material environmental harm or environmental nuisance; and
   2.2 If required by the Director a Care and Maintenance Plan for the activity must be submitted, by a date specified in writing by the Director, for approval. The person responsible must implement the approved Care and Maintenance Plan, as may be amended from time to time with written approval of the Director.

3 Unless otherwise approved in writing by the Director, if the activity on The Land has substantially ceased for 2 years or more, rehabilitation of The Land must be carried out in accordance with the requirements of these conditions as if the activity has permanently ceased.

Effluent

EF1 Effluent discharge locations

1 Effluent from the activity must only be discharged from The Land to the Mill in such a manner that all effluent from the plant is treated by the Mill wastewater treatment plant (WWTP), this being the WWTP described in section 2.4.2 of the EER.

2 Effluent must not be discharged from The Land at times where the Mill WWTP is not operational.

EF2 Maximum effluent discharge volume

Unless otherwise approved in writing by the Director, the volume of effluent discharged from The Land must not exceed 3.2 kilolitres per 24 hour period.

EF3 Effluent Emissions Characterisation and Monitoring Plan

1 Within 6 months of the date of commencement of commissioning of the activity, or by a date otherwise specified in writing by the Director, a revised Effluent Emissions Characterisation and Monitoring Plan must be submitted to the Director for approval. This requirement will be deemed to be satisfied only when the Director indicates in writing that the submitted document adequately addresses the requirements of this condition to his or her satisfaction.

2 The plan must be consistent with Section 3.6 and Attachment 3 of the EER.

3 The plan must be prepared in accordance with any reasonable guidelines provided by the Director.

4 Without limitation, the plan must include details of the following:
   4.1 a description of effluent generation and characterisation methodology, as carried out in accordance with the EER;
   4.2 discussion of the validity of the methodology chosen for assessment of the efficacy of the Mill wastewater treatment plant for the treatment of effluent generated by the Activity;
   4.3 the results of effluent characterisation works and biodegradability trials including details of breakdown products;
4.4 an evaluation of potential ecotoxicity of treated effluent from the activity, including evaluation of worst case scenarios such as uncontrolled emission of any product or waste from the activity to the Mill wastewater treatment plant as a result of an incident, accident or malfunction, or the malfunction of the wastewater treatment plant;

4.5 details of any further effluent characterisation works to be carried out including any ecotoxicity testing where determined to be necessary;

4.6 details of any ongoing effluent monitoring plan determined to be necessary including monitoring parameters and location(s);

4.7 a table containing all of the major commitments made in the plan;

4.8 an implementation timetable for key aspects of the plan; and

4.9 a reporting program to regularly advise the Director of the results of the plan.

5 The person responsible must implement and act in accordance with the approved plan.

6 In the event that the Director, by notice in writing to the person responsible, either approves a minor variation to the approved plan or approves a new plan in substitution for the plan originally approved, the person responsible must implement and act in accordance with the varied plan or the new plan, as the case may be.

**Hazardous Substances**

**H1 Hazardous materials (< 250 litres)**

1 Unless otherwise approved in writing by the Director, each environmentally hazardous material, including chemicals, fuels and oils, held on The Land in discrete volumes not exceeding 250 litres, but not including discrete volumes of 25 litres or less, must be located within bunded containment areas or spill trays which are designed to contain at least 110% of the volume of the largest container.

2 Bunded containment areas and spill trays must be made of materials that are impervious to any environmentally hazardous materials stored within the bund or spill tray.

**H2 Storage, handling and processing of hazardous materials**

1 Unless otherwise approved in writing by the Director, all environmentally hazardous materials, including all chemicals, fuels, and oils, held on The Land in volumes exceeding 250 litres must be stored, handled and processed in accordance with the following:

1.1 Any storage or processing facility must be contained within a spill collection bund with a net capacity of whichever is the greater of the following:

1.1.1 at least 110% of the combined volume of any interconnected vessels within that bund; or

1.1.2 at least 110% of the volume of the largest storage or processing vessel; or

1.1.3 at least 25% of the total volume of all vessels contained in that spill collection bund; or

1.1.4 the capacity of the largest tank plus the output of any firewater system over a twenty minute period.

1.2 All activities that involve a significant risk of spillages, including the loading and unloading of bulk materials, must take place in a bunded containment area or on a transport vehicle loading apron.

1.3 Bunded containment areas and transport vehicle loading aprons must:

1.3.1 be made of materials that are impervious to any environmentally hazardous material stored or processed within the bund;
1.3.2 be graded or drained to a sump to allow recovery of liquids;
1.3.3 be chemically resistant to the chemicals stored or transferred;
1.3.4 be designed and managed such that any leakage or spillage is contained within the bunded area (including where such leakage emanates vertically higher than the bund wall);
1.3.5 be designed and managed such that the transfer of materials is adequately controlled by valves, pumps and meters and other equipment wherever practical. The equipment must be adequately protected (for example, with bollards) and contained in an area designed to permit recovery of any released chemicals;
1.3.6 be designed such that chemicals which may react dangerously if they come into contact have measures in place to prevent mixing; and
1.3.7 be managed such that the capacity of the bund is maintained at all times (for example, by regular inspections and removal of obstructions).

H3 Spill kits
Spill kits appropriate for the types and volumes of materials handled on The Land must be kept in appropriate locations to assist with the containment of spilt environmentally hazardous materials.

Stormwater Management

SW1 Separation of stormwater

1 The activity must be managed in a manner such that:
1.1 ingress of stormwater into operational areas on The Land is prevented; and
1.2 the emission from The Land of any hazardous material that has spilled or leaked is prevented, except where that material is removed to a facility approved to receive such material or is discharged in accordance with the approval of the Director.

Waste Management

WM1 Biochar disposal
Unless otherwise approved in writing by the Director, biochar generated by the activity must only be moved from The Land to the Mill and only for disposal by burning in the boiler known as No. 5 Boiler, this being the boiler described in section 2.4.1 of the EER.
Schedule 3: Information

Legal Obligations

LO1 EMPCA
The activity must be conducted in accordance with the requirements of the *Environmental Management and Pollution Control Act 1994* and Regulations thereunder. The conditions of this document must not be construed as an exemption from any of those requirements.

LO2 Storage and handling of dangerous goods, explosives and dangerous substances
1 The storage, handling and transport of dangerous goods, explosives and dangerous substances must comply with the requirements of relevant State Acts and any regulations thereunder, including:
   1.1 *Work Health and Safety Act 2012* and subordinate regulations;
   1.2 *Explosives Act 2012* and subordinate regulations; and
   1.3 *Dangerous Goods (Road and Rail Transport) Act 2010* and subordinate regulations.

LO3 Change of responsibility
If the person responsible for the activity ceases to be responsible for the activity, they must notify the Director in accordance with Section 45 of the EMPCA.

Other Information

OI1 Waste management hierarchy
1 Wastes should be managed in accordance with the following hierarchy of waste management:
   1.1 waste should be minimised, that is, the generation of waste must be reduced to the maximum extent that is reasonable and practicable, having regard to best practice environmental management;
   1.2 waste should be re-used or recycled to the maximum extent that is practicable; and
   1.3 waste that cannot be re-used or recycled must be disposed of at a waste depot site or treatment facility that has been approved in writing by the relevant planning authority or the Director to receive such waste, or otherwise in a manner approved in writing by the Director.

OI2 Notification of incidents under section 32 of EMPCA
Where a person is required by section 32 of EMPCA to notify the Director of the release of a pollutant, the Director can be notified by telephoning 1800 005 171 (a 24-hour emergency telephone number).

OI3 Commitments
The person responsible for the activity has a general environmental duty to conduct the activity in accordance with the commitments contained in Attachment 2.
ATTACHMENT 1: THE LAND

(within the area defined by corner coordinates A: NW, B: NE, C: SE, D: SW)
## ATTACHMENT 2: COMMITMENTS

<table>
<thead>
<tr>
<th>No.</th>
<th>Commitment</th>
<th>Completion date</th>
<th>By Whom</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>Drains sealed and spill protection (bunds and barriers) installed at the main entrances to the Salt Store and around the internal plant processing equipment.</td>
<td>Prior to operation of the plant</td>
<td>Norske Skog</td>
</tr>
<tr>
<td>02</td>
<td>Dedicated spill kits appropriate for the materials present in the plant will be located inside the Salt Store in close proximity to potentially environmentally hazardous materials, processing equipment and stormwater access points.</td>
<td>Prior to operation of the plant</td>
<td>Norske Skog</td>
</tr>
<tr>
<td>03</td>
<td>FC4 biochar will be collected for detailed analysis from the next 48 h continuous run planned for late April. Once the FCS Plant is operational, biochar samples will be collected for routine analysis and characterisation (including EPA Bulletin 105 contaminants) 3-monthly during the first year of operation and 6-monthly thereafter.</td>
<td>April/May Within 3 months of first operation then ongoing</td>
<td>Circa &amp; Norske Skog</td>
</tr>
<tr>
<td>04</td>
<td>No. 5 Boiler stack testing (including metal suite) to be completed within first 3 months after achieving steady plant operation and at a time FCS biochar is being burned.</td>
<td>Within 3 months of first operation</td>
<td>Norske Skog</td>
</tr>
<tr>
<td>05</td>
<td>Reagents used in the process through to the wastewater and biochar generated by the process will undergo routine measurement and monitoring by trained staff of Norske Skog's Technical Support &amp; Development group.</td>
<td>Ongoing</td>
<td>Norske Skog</td>
</tr>
<tr>
<td>06</td>
<td>Construction and operation of a small bench top wastewater process that treats the FCS wastewater, either by itself or in combination with other mill process waters.</td>
<td>Within 6 months of first operation then ongoing</td>
<td>Norske Skog</td>
</tr>
<tr>
<td>07</td>
<td>Treated wastewater from the bench top wastewater process will be characterised both quantitatively and qualitatively using techniques such as GC/MS. Should this quantitative/qualitative evaluation identify compounds of concern, the treated wastewater toxicity to a range of aquatic species relevant to the Derwent River receiving waters may be evaluated.</td>
<td>Ongoing</td>
<td>Norske Skog</td>
</tr>
<tr>
<td>08</td>
<td>A report to the Director of the EPA characterising the treated effluent and assessing treatment efficacy and potential residual environmental impact of effluent will be provided within 6 months of the commencement of commissioning of the plant.</td>
<td>Within 6 months of commissioning</td>
<td>Norske Skog</td>
</tr>
<tr>
<td>09</td>
<td>Detailed characterisation (EPA Bulletin 105 contaminants) of boiler ash to measure potentially relevant changes in ash composition will be performed 3-monthly during the first year of operation and 6-monthly thereafter.</td>
<td>Within 3 months of first operation then ongoing</td>
<td>Norske Skog</td>
</tr>
<tr>
<td>No.</td>
<td>Description</td>
<td>Time Frame</td>
<td>Responsible Party</td>
</tr>
<tr>
<td>-----</td>
<td>------------------------------------------------------------------------------</td>
<td>-----------------------------------</td>
<td>-------------------</td>
</tr>
<tr>
<td>10</td>
<td>Within the first 6 months of operation, sound measurements of the FC5 Prototype Plant will be used to determine actual plant sound power and update the site noise model.</td>
<td>Within 6 months of first operation</td>
<td>Norske Skog</td>
</tr>
<tr>
<td>11</td>
<td>In the event any equipment noise emissions are noted as being tonal in character and likely to give rise to community issues, control measures will be implemented.</td>
<td>As required</td>
<td>Norske Skog</td>
</tr>
<tr>
<td>12</td>
<td>Environmental incidents will captured in the site incident register and reported as per EPN conditions as required.</td>
<td>Immediately</td>
<td>Norske Skog</td>
</tr>
<tr>
<td>13</td>
<td>Registered waste contractors will be used to remove and dispose of potential hazardous chemical wastes and residues that cannot otherwise be treated on site.</td>
<td>Immediately</td>
<td>Norske Skog</td>
</tr>
<tr>
<td>14</td>
<td>Empty reagent/chemical containers (IBCs) are returned to respective suppliers for reuse, recycling or disposal.</td>
<td>Immediately</td>
<td>Norske Skog</td>
</tr>
<tr>
<td>15</td>
<td>Sampling of existing groundwater bores as part of outline environmental surveillance will be closely monitored for potential mobilisation of contaminants and groundwater impacts during plant construction and operation.</td>
<td>Ongoing</td>
<td>Norske Skog</td>
</tr>
</tbody>
</table>