# Final Regulatory Impact Statement

# Protection of the Environment Operations (General) Regulation 2009

Department of **Environment & Climate Change** NSW

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# Abbreviations

| | |
|---|---|
| AFU | administrative fee unit |
| AL | assessable load |
| ARA | appropriate regulatory authority |
| BaP | benzo[a]pyrene |
| BOD | biological oxygen demand |
| CPI | Consumer Price Index |
| CZ | pollutant critical zone weighting |
| DECC | Department of Environment and Climate Change NSW |
| EPA | Environment Protection Authority |
| FRT | fee rate threshold |
| IFOA | Integrated Forestry Operations Approval |
| LBL | load-based licensing |
| LRA | load reduction agreement |
| $NO_x$ | oxides of nitrogen |
| NPI | National Pollutant Inventory |
| PAH | polycyclic aromatic hydrocarbon |
| PFU | pollutant fee unit |
| $PM_{2.5}$ | particulate matter, up to 2.5 micrometres in diameter |
| $PM_{10}$ | particulate matter, up to 10 micrometres in diameter |
| POEO Act | *Protection of the Environment Operations Act 1997* |
| PW | pollutant weighting |
| RIS | regulatory impact statement |
| $SO_x$ | oxides of sulfur |
| VOCs | volatile organic compounds |

# Summary

Under the *Subordinate Legislation Act 1989*, the Protection of the Environment Operations (General) Regulation 1998 (the Regulation) was repealed on 1 September 2009. The Regulation was remade as the Protection of the Environment Operations (General) Regulation 2009.

The new Regulation should support the operation of the *Protection of the Operations Act 1997* (POEO Act) at least cost to the community and assist the Department of Environment and Climate Change NSW (DECC) to achieve the objectives of the POEO Act and other legislation that it administers.

The new Regulation aims to achieve this by:

- ensuring that the provisions of the POEO Act can be implemented in an efficient and effective manner
- recovering the costs of administering the POEO Act and the Regulation, as part of applying the 'polluter pays' principle
- providing additional incentive for the reduction of emissions of pollutants from activities under Schedule 1 of the POEO Act – this includes encouraging licensees subject to load-based licensing (LBL) to improve their environmental performance beyond what is required by the complementary command and control approaches.

In 2004, DECC commenced a review of the existing Regulation to identify changes required to improve its operation. The review:

- considered submissions received from stakeholders
- incorporated recommendations from the review of the POEO Act
- included a review of the LBL scheme.

The review of the Regulation and the resulting proposed amendments aim to:

- improve the ability of DECC to achieve environmental objectives through the administration of licences and other regulatory instruments available through the POEO Act
- refine the LBL scheme based on experience and information to date – this will ensure that the scheme captures the most significant sources of pollution from the industrial sector and continues to provide an incentive for licensees to reduce their impact on the environment.

The key changes made included:

- changes to environment protection notice fees
- changes to environment protection licence fees
- changes to the assessable pollutants and fee rate threshold factors that apply under the LBL scheme
- changes to load reduction agreements
- removing the licensing requirements from certain low risk activities and regulating their operation by existing environmental legislation provisions
- removing reporting requirements for biomaterial burning by electricity generators, while keeping the offence to burn native forest biomaterial for electricity generation
- providing an exemption for cold water pollution offences for the Snowy Hydro Corporation.

# 1 Introduction

## 1.1 Purpose and content of this document

As required by the *Subordinate Legislation Act 1989*, this regulatory impact statement (RIS) has been prepared to assess the economic and social costs and benefits of the new Protection of the Environment Operations (General) Regulation 2009 and its alternatives. It includes the following to ensure that the new Regulation provides the greatest net benefit and/or the least net cost to the community compared with its alternatives:

- an evaluation of the impacts of letting the Protection of the Environment Operations (General) Regulation 1998 (the previous Regulation) lapse (that is, not proceeding with any Regulation)
- an evaluation of the social, environmental and economic costs and benefits, both direct and indirect, for the proposed amendments to the Regulation and their alternatives, including the impacts on resource allocation, administration, and compliance with statutory requirements.

This RIS has been structured as follows:

- Section 1 introduces the purpose and content.
- Section 2 sets out the legislative framework in which the new Regulation operates and outlines its main features.
- Section 3 outlines the objectives of the new Regulation and assesses alternative regulatory approaches.
- Sections 4–11 detail the amendments to the previous Regulation and assess the costs and benefits of each amendment.

## 1.2 Consultation

In accordance with the *Subordinate Legislation Act 1989*, DECC consulted the public, relevant interest groups and other groups likely to be affected by the new Regulation and its alternatives during the Regulation's development.

DECC conducted a mail-out to all licensees, industry associations, non-government organisations and other state agencies to advise them of the review and invite submissions for the update of the Regulation, which resulted in 40 submissions from stakeholders. The new Regulation also includes amendments that address issues raised during the review of the *Protection of the Operations Act 1997* (POEO Act).

DECC provided additional opportunities for all stakeholders to comment on the new Regulation. This RIS and the proposed Regulation were available for public comment for a period of more than 4 weeks.

The consultation involved stakeholders receiving a tailored explanatory letter (including a web link to the draft Regulation and RIS) and where appropriate a more detailed fact sheet. In addition four individually tailored presentations were given to over seventy stakeholders to facilitate understanding and encourage submissions.

# 2 Legislative and regulatory framework

DECC has responsibilities and regulatory powers under NSW environmental legislation.[1] Some of these responsibilities and powers are exercised in the name of the Environment Protection Authority (EPA), the National Parks and Wildlife Service, and the Botanic Gardens Trust.

This section outlines the legislative framework within which the previous Regulation operated, including:

- the POEO Act
- other regulations and programs under the POEO Act that complement the Regulation.

Several of the amendments proposed aim to complement and/or give effect to amendments recently made to the POEO Act.

## 2.1 Protection of the Environment Operations Act 1997

The POEO Act, which commenced on 1 July 1999, is the key environment protection legislation administered by DECC. It:

- provides a broad allocation of responsibilities between DECC, local councils and other public authorities
- establishes the heads of power for DECC, and in some cases other appropriate regulatory authorities (ARAs), to protect the NSW environment through a range of tools, including licensing.

DECC undertook an extensive review of the POEO Act in accordance with section 327 of the POEO Act. The review recommended some changes to refine and improve the day-to-day operation of the POEO Act.[2]

## 2.2 Protection of the Environment Operations (General) Regulation 1998

The Regulation gave effect to many of the powers provided by the POEO Act. It did this by setting out requirements including:

- environment protection notice fees
- environment protection licence fees
- the LBL framework
- National Pollutant Inventory (NPI) reporting obligations.

[1] www.environment.nsw.gov.au/legislation/
[2] www.environment.nsw.gov.au/legal/aboutpoeo.htm, and www.environment.nsw.gov.au/legal/poeoreview.htm#POEO%20Amendment%20Act.

### 2.2.1 Contents of the Regulation

The Regulation was made up of the following chapters:

- Chapter 1 set out the preliminaries of the Regulation.
- Chapter 2 included provisions relating to licensing.
- Chapter 3 included provisions relating to water pollution.
- Chapter 3A included provisions under the NPI.
- Chapter 3B included provisions relating to the burning of biomaterial in electricity generating works.
- Chapter 4 included a range of general provisions.

The contents of chapters 2–4 are discussed further below.

Chapter 2:

- set out how to calculate fees in relation to environment protection licences, and makes provision for adjustment or refunds of those fees
- set out fees for environment protection notices
- made provisions for LRAs, which allow fee rebates in return for measures taken to reduce pollution in the future
- established a review panel to advise the EPA on licensing matters, including load calculation protocols
- set out the matters to be included by the EPA in its statement of reasons for granting or refusal of a licence application
- made it an offence to provide information that is false or misleading in relation to a licence application
- required licensees to retain records of methods used to calculate licence fees.

Chapter 3:

- prescribed certain matter, when placed into water, to be water pollution, and the methodology for testing prescribed matter in water
- exempted certain water pollution from the water pollution offence under the POEO Act
- allowed the EPA to prohibit or regulate certain activities which threaten the safety of drinking water that is part of a public water supply.

Chapter 3A gave effect to the National Environment Protection (National Pollutant Inventory) Measure by requiring occupiers of certain facilities to submit data to the EPA relating to the emission of certain substances. Section 2.4 provided more information on the NPI.

Chapter 3B prohibited the burning of certain biomaterial from Australian native forests in certain electricity generating works, and required records and reports to be made in accordance with EPA guidelines.

Chapter 4:

- prescribed certain forms to be used with respect to warrants relating to noise abatement directions
- set out additional matters to be included in the public register maintained under section 308 of the POEO Act

- declared certain bodies to be the ARA in relation to certain activities for the purposes of the POEO Act
- provided exceptions to the prohibition on placing advertising material on vehicles
- outlined additional matters (other than those covered in the POEO Act) to be considered by the EPA before requiring financial assurances from licensees.

## 2.3 Protection of the Environment Operations (Clean Air) Regulation 2005

DECC administers the Protection of the Environment Operations (Clean Air) Regulation 2005 (the Clean Air Regulation).[3] It is a legislative tool used to implement objectives of the POEO Act and is a key piece of legislation for the management of industrial air emissions in NSW.

The Clean Air Regulation specifies air pollutant emission standards for industrial sources. The focus of the Clean Air Regulation is the protection of local air quality through control of emissions at the point of discharge. Emission standards are set for a range of pollutants, including solid particles (all particulate matter), nitrogen oxides ($NO_x$), halogens, smoke, heavy metals and dioxins. The standards are set at a level that is achievable with emissions performance technology that is reasonably available and provide a minimum performance standard for industry operation in NSW. These standards apply to all licensed activities listed in Schedule 1 of the POEO Act.

In relation to plant, equipment and activities, the Clean Air Regulation:

- sets maximum limits on emissions from activities and plant for a number of substances including chlorine, dioxins, furans, smoke, solid particles and sulfur
- deals with the transport and storage of volatile organic liquids
- restricts the use of high sulfur liquid fuel
- imposes operational requirements for certain afterburners, flares, vapour recovery units and other treatment plant.

Whereas LBL focuses on the annual mass of pollutants emitted, the Clean Air Regulation targets localised and acute elevations in emissions. It applies short-term concentration standards to individual stacks at the point of discharge to the atmosphere. The standards set a minimum standard of performance that protects against localised and acute pollution episodes.

The Clean Air Regulation and the LBL scheme complement each other and work in tandem to minimise emissions from industry, to meet ambient air quality standards and to protect the health of the NSW community. The relationship is summarised in Table 1.[4]

[3] The Clean Air (Plant and Equipment) Regulation 1997 was incorporated into the Clean Air Regulation in July 2005, which replaced the Protection of the Environment Clean Air (Domestic Solid Fuel Heaters) Regulation 1997, and the Protection of the Environment Clean Air (Motor Vehicles and Motor Vehicle Fuels) Regulation 1997.

[4] DEC (2005) *Regulatory Impact Statement for the Protection of the Environment (Clean Air) Regulation 2002*, Department of Environment and Conservation NSW, p.11.

**Table 1: Comparison of the Clean Air Regulation and LBL**

| Clean Air Regulation | LBL |
|---|---|
| Applies to all licensed activities | Applies to a subset of licensed activities |
| Sets emission concentration standards as minimum performance standards | Relates to emission loads and creates incentive to reduce annual loads emitted |
| Applies to individual emission points | Applies to entire premises or sites |
| Protects against localised and acute elevations in emissions; protects local air quality | Provides an incentive to reduce emissions and helps to protect ambient air quality against cumulative increases in emissions |

Note that the Clean Air Regulation, POEO Act and the Regulation do not set load limits. Load limits are set by specific licence conditions on environment protection licences. By contrast, the Clean Air Regulation prescribes emission concentration limits for all licensees.

## 2.4 National Pollutant Inventory

NPI was the first National Environment Protection Measure agreed by the Commonwealth, states and territories. It is a public database[5] containing information on releases to air, land and water of 93 substances. These substances are emitted from point sources, such as industrial facilities, and as aggregated emissions from diffuse sources, such as vehicles and domestic activities. Its purpose is to support the community's right to know, improve knowledge for better decision making and promote cleaner production.

The Regulation placed NPI reporting obligations on industrial facilities in NSW and also prescribed the offences for which penalty notices may be issued, which include failure to lodge a report when due and failure to keep and produce records.

Each year, about 760 industrial facilities in NSW submit NPI reports. Of these facilities, approximately 480 have environment protection licences, of which 160 are LBL premises. These programs have 18 pollutants in common that represent the major pollutants emitted by industry. Facilities report emissions of 93 pollutants to air, land and water in the NPI compared with 29 assessable pollutants in LBL. The majority of NPI reporting is focused on air emissions.

The methodology for estimating emissions for NPI purposes is similar to calculating pollutant loads for LBL. However, once a substance threshold is triggered for NPI reporting, emissions of the substance from *all* sources on site are required whereas this may not be the case in LBL. For premises captured by LBL, the *Load Calculation Protocol* prescribes the components of each activity for which assessable pollutant loads must be determined. Therefore, it would be expected that NPI emissions of a substance would generally be equal to or greater than the analogous LBL load.

As a result of this relationship between the NPI and LBL, this RIS uses available NPI data to evaluate the current coverage of key pollutants under the LBL scheme and compare alternative options for the new Regulation.

[5] www.npi.gov.au

# 3 The new Regulation

## 3.1 Objectives of the new Regulation

Section 323 of the POEO Act provides for Regulations to be made that are not inconsistent with the Act, for any matter required for carrying out or giving effect to the Act. The new Regulation gives effect to the objectives of the POEO Act.

In accordance with the *Subordinate Legislation Act 1989*, the new Regulation was assessed against the following two broad criteria:

- whether the new Regulation would succeed in implementing and facilitating the aims of the POEO Act, which sets the framework for environment protection in NSW
- whether the new Regulation embodies the best options and strategies for implementing and facilitating these aims.

The general objective of the new Regulation is to protect the environment and human health by reducing emissions of pollutants for activities under Schedule 1 of the POEO Act. It aims to achieve this by:

1 Ensuring the provisions of the POEO Act can be implemented in an efficient and effective manner.

The POEO Act leaves a number of matters to be prescribed by regulation, such as exemptions for licences, licence and notice fees, definitions and pollution standards. The new Regulation should support the efficient and effective administration of the Act by specifying these matters.

2 Recovering the costs of administering the POEO Act and the Regulation by applying the 'polluter pays' principle.

Administering the POEO Act and the new Regulation involves issuing and enforcing environment protection notices and over 3000 licences. The Regulation seeks to recover these costs from polluters and regulated activities — consistent with NSW Government policy and as recommended by the National Competition Policy review.[6]

3 Supporting and encouraging the use of cost-effective and timely strategies to achieve pollutant discharge reductions.

The previous Regulation provided the framework of the LBL scheme. The new Regulation aims to ensure that the LBL scheme continues to provide appropriate incentives to industry to reduce emissions and adopt cleaner technologies.

[6] NSW Treasury (2001), *Guidelines for Pricing of User Charges*, Office of Financial Management, Policy and Guidelines Paper, NSW Treasury. These guidelines state that government agencies should set prices that at least cover their avoidable costs – that is, costs that would have been avoided by not providing the service.

## 3.2 No Regulation

The 'no Regulation' option would occur if the previous Regulation was automatically repealed on 1 September 2008.

This was not considered a feasible option for the following reasons.

- DECC charges fees to recover the costs of the administration and implementation of the environment protection licensing system. A no Regulation option would essentially be a no fee option since the POEO Act requires licences to be issued, but does not specify fees.
- Local councils and DECC would not be able to recover the costs associated with issuing clean-up, prevention and noise abatement notices.
- There would be no system for administering a load-based fee under this option. As a result, DECC would need to implement other complementary approaches (such as additional 'command and control approaches') to control point source and fugitive emissions from an industry that conducts activities considered to be of high risk to the environment. By themselves, these approaches are considered much less cost-effective in reducing emissions since they do not provide incentives for the regulated community to improve beyond compliance. This option is also inconsistent with the polluter pays principle and government policy.
- DECC would no longer have powers to enforce compliance with NPI reporting provisions on facilities that exceed the reporting thresholds.
- DECC would lose vehicle testing and inspections provisions which set out the approval process for inspection stations and the maximum fees for inspection for notices issued under section 207(2)(c) of the POEO Act.

There are other consequences if the Regulation were allowed to lapse.

- DECC would no longer have a legislative basis for negotiating flexible pollution management agreements such as bubble licensing, and would have to develop alternative approaches to regulating environmental quality in a catchment area or airshed, or use individual discharge point limits. Bubble licensing agreements allow licensees to adjust their discharges at individual sources provided the aggregate limit (for all licensees included within the bubble scheme) is not exceeded. This allows environmental improvement (that is, nutrient reduction in the creeks and mainstream of a river) to be achieved at lower cost. Benefits achieved through current bubble licences include a reduced potential for excessive growth of algae and aquatic vegetation, and improved protection of aquatic ecosystems.
- The definition of 'prescribed matter' for the purpose of section 120 of the POEO Act (which defines water pollution and makes water pollution an offence) would lapse. There would be no clear regulatory basis for taking action against water polluters, as the definition of water pollution would be open to dispute. This would significantly undermine the ability of the NSW Government to regulate water pollution in the public interest, and could lead to adverse economic and environmental impacts such as fish kills, loss of water amenity (such as swimming and sailing) and/or increased loads (and treatment requirements) on sewage treatment plants.
- DECC would lose the power to prohibit or regulate aquatic activities (such as swimming, boating, fishing) that threaten the safety of drinking water. This could

impose significant economic and environmental costs where drinking water quality is affected by these activities, leading to a lack of available drinking water.

- DECC would no longer be listed as the ARA for certain activities and it would be unclear who should be the ARA for outdoor entertainment activities listed in section 67 of the Regulation. If the definition was interpreted so that these activities were not carried out by the state or a public authority, local council would become the ARA. This would be inconsistent with section 6(2)(c) of the POEO Act which provides that local councils should not be the ARA for activities carried out by the state or a public authority. In addition, specific environmental issues could not be managed by the appropriate agencies if the declarations of specific ARAs contained in the Regulation did not exist. For example, the Marine Parks Authority utilises POEO Act powers to manage environmental problems specific to marine parks. Without these powers it could not provide an integrated response to specific environmental problems in conjunction with its powers under the *Marine Parks Act 1997*.

It is impossible to accurately quantify the likely decline in environment protection that would eventuate as a result of allowing the previous Regulation to lapse. If the Regulation lapsed it would have posed a significant risk to the ability of DECC to regulate scheduled activities under the POEO Act as DECC would not be able to recover costs. This, in turn, might lead to a decrease in the environmental performance of businesses operating, and actions undertaken, under the scope of the Regulation. Any reduction in environment performance may result in higher risk of health effects (mortality and morbidity) and degraded environmental amenities (visibility, crop productivity). That is, a lapse in the Regulation would reduce social welfare. These effects would outweigh industry savings incurred through lower licensing fees. Therefore, relative to the current operation of the Regulation, the option of allowing the previous Regulation to lapse would impose a significant cost on NSW.

## 3.3 Regulatory approaches

The previous RIS for the Pollution Control Regulation 1998 considered the advantages and disadvantages of four regulatory options to achieve the objectives of the Regulation.[7] These options included:

- legislating targets – DECC would stipulate uniform discharge limits for each class of licensed industry type or emitting equipment
- negotiated case-by-case limits – DECC would set site-specific limits and targets
- pollution charges – control over discharges would be achieved by assigning a fee to each discharge
- tradeable permits – DECC would establish quotas or release permits for polluting substances. The total number of permits would be set to achieve desired environmental goals, either immediately or over time. Licence holders would need to obtain sufficient permits to match their quantity of discharge. If they do not release emissions equivalent to the number of permits that they possess, they may sell their excess permits to other licensees. Licensees with a deficit of permits could either reduce their discharges or purchase additional permits.

The preferred approach was to use a combination of strategies. No one strategy was seen as superior to the others as a primary approach to all of the following

[7] NSW EPA (1998), *Regulatory Impact Statement for the Proposed Pollution Control Regulation 1998*, pp. 22–27.

performance measures: efficiency, effectiveness, transparency, flexibility, competition, reducing environmental costs, and information requirements.

After over five years of operation, there was found to be a high level of satisfaction with the framework and philosophy of the POEO Act. Similarly, the review of the Regulation suggests the current approach (that combines the range of regulatory approaches outlined above) continues to be supported.

The new Regulation contains a number of refinements to the LBL scheme based on implementation experience and available information. Fundamental changes to the LBL scheme were not proposed at that time.

## 3.4 Provisions of the new Regulation

The amendments to the previous Regulation, reflected in the new Regulation, were:

- changes to environment protection notice fees
- changes to environment protection licence fees
- changes to the assessable pollutants and fee rate threshold (FRT) factors that are applied to specific fee-based activities under the LBL scheme
- changes to LRAs
- removing the licensing requirements from certain low risk activities and regulating their operation by existing environmental legislation provisions
- removing biomaterial burning reporting requirements for electricity works from the Regulation, while keeping the offence to burn native forest biomaterial for electricity generation
- providing an exemption for cold water pollution offences for the Snowy Hydro Corporation

These are discussed in the following sections.

## 3.5 Analysis of options

The RIS aims to assess the costs and benefits of the new Regulation and its alternatives. The sections that follow evaluate, where possible, the social, environmental and economic costs and benefits (both direct and indirect) of the amendments and their alternatives. This includes an evaluation of the impacts on resource allocation, administration and compliance with existing statutory requirements.

The assessment is based on a mix of qualitative and quantitative analyses. Where impacts can be quantified, estimated costs and benefits are assessed over a five-year period to reflect the life of the new Regulation.

# 4 Clean-up, prevention and noise control notice fees

The Regulation provides fees relating to clean-up, prevention and noise control notices outlined in the POEO Act. Authorised officers of DECC and of local councils can issue these notices for the purposes described below.[8]

**Clean-up notices** require a person to take specified clean-up action when they reasonably suspect that a pollution incident has occurred or is occurring. A clean-up notice may be issued when a leak, spill or other escape or deposit of a substance that results in pollution is likely to occur, has occurred or is occurring. Notices are not restricted to being issued once an event has occurred, as clean-up action may include 'action to prevent, minimise, remove, disperse, destroy or mitigate any pollution resulting or likely to result from the incident.'

**Prevention notices** are issued where it is reasonably suspected that an activity has been, or is being, carried out in an 'environmentally unsatisfactory manner'. A prevention notice would generally not be issued for an activity that is regulated under an environment protection licence if the problem can be resolved by placing appropriate conditions on the licence.

**Noise control notices** are issued to prohibit carrying out any activity, including keeping an animal or using any article, that emits noise above a specified level.

The recipient of clean-up, prevention and noise control notices must pay a prescribed fee, representing the administrative costs of issuing the notice, to the authority that issued the notice.

While notices may be issued in relation to activities undertaken by the holders of environment protection licences, DECC can use the conditions of a licence to ensure that the licensee undertakes preventative, ongoing operational and/or remediation actions, aimed at achieving the same outcomes as environment protection notices and noise control notices.

There has been a positive response to the opportunities provided by clean-up, prevention and noise control notices for local council officers and DECC officers in responding to urgent, critical and/or dangerous pollution incidents in NSW. For non-scheduled activities, notices are generally the only tool by which environment protection actions can be directed and enforced.

The administrative fee for clean-up, prevention and noise control notices is an important mechanism for recovering the costs associated with the regulation of non-scheduled activities, and ensures that the cost of regulation is passed to the appropriate party (the person responsible for the incident, generally the subject of the notice).

Initially noise control notices did not comprise an administrative fee and this resulted in their under-utilisation as revealed in the review of the POEO Act. Before the fee was introduced, some local councils were using prevention notices rather than noise control notices as the former allowed cost recovery.

[8] DECC (2009) *Guide to Notices under the Protection of the Environment Operations Act 1997,* Department of Environment and Climate Change NSW, available at www.environment.nsw.gov.au/licensing/guidetonotices.htm.

The RIS for the Pollution Control Regulation 1998 outlined the reasons for the use of this fee structure. Although the level of resources needed to issue a notice varies, it was estimated that the range was relatively narrow and as such a flat fee was considered reasonably equitable and provides reasonable certainty that costs will be recovered.

There have been no increases to the $320 administrative fee for clean-up or prevention notices since they were first introduced in 1999. The administrative fee for noise control notices was first introduced in 2006 and was set at $320 to align with the administrative fees for clean-up and prevention notices.

The review of the POEO Act found that the current fee level fails to recover the costs of issuing clean-up, prevention and noise control notices, and as a result notices may not be issued in response to pollution incidents.[9] A number of local councils have informed DECC that they are reluctant to issue these notices because they believe that the cost of doing so is no longer fully recovered.

The objective of this amendment is to increase fees for clean-up, prevention and noise control notices so that they maintain cost recovery as determined in the initial RIS and meet NSW Government policy on cost recovery.

## 4.1 Options considered

Two options were considered for amending the administrative notice fee:

Option 1 – no change (base case)

Option 2 – increase clean-up and prevention notice fees to cover Consumer Price Index (CPI) increases since 1999, align noise control notice fees to this level, and then index to CPI thereafter.

Under option 1, the notice fees would not be changed. Information indicates that the current notice fee does not represent the cost to EPA or local councils of administering notices.

Under option 2, notice fees would be increased from $320 to $433, to take into account changes in the CPI since 1999. Notice fees would then increased by the projected CPI level over the course of the Regulation, as shown in Table 2, to ensure that the fee is not eroded by inflation.

Option 2 is the preferred option since it ensures that the provisions of the POEO Act can be implemented in an efficient and effective manner over the life of the Regulation, by linking the administrative fee to estimated CPI. This is aimed at meeting the NSW Government's policy of full cost recovery.

[9] Taverner Research Company (2003), *Review of the Protection of the Environment Operations Act 1997*: *a report on 93 questionnaires completed by Environmental Officers of the Councils of NSW*, prepared for the NSW EPA, March 2003

**Table 2: Proposed fees for clean-up, prevention and noise control notices**

| Commence | Estimated CPI[a] | Fee |
|---|---|---|
| Current | | $320 |
| 2009–10 | 2.5 | $433 |
| 2010–11 | 2.5 | $444 |
| 2011–12 | 2.5 | $455 |
| 2012–13 | 2.5 | $466 |

[a] Australian Bureau of Statistics – CPI Longer Term Series; NSW Treasury (2006) 2006–07 Budget Paper – Budget Statement (Chapter 6)

## 4.2 Costs and benefits of the new Regulation

Under the new Regulation, persons receiving a clean-up, prevention or noise control notice have to pay a higher fee than was previously applicable. The proposed Regulation would primarily affect individuals or non-scheduled premises who receive a notice from DECC or a local council. Licensed activities are unlikely to be affected because DECC tends to rely on the conditions of environment protection licences to regulate activities under the POEO Act.

Based on the number of clean-up and prevention notices issued over the past five years, approximately 60 notices are issued by DECC each year. It is difficult to accurately estimate the number of notices that local councils issue each year. For the purpose of predicting costs, it is assumed that local councils would issue 1700 notices per annum (10 notices per local council per annum).[10] This results in total current revenue from notice fees of approximately $563,200; however, it must be noted that DECC or local councils may waive payment of the administrative fee.

Table 3 shows that when compared with the current estimated revenue, the new Regulation will increase revenue collected in relation to clean-up, prevention and noise control notices by $198,880 in the first year with an additional $19,360 collected in each following year. The estimated notice fee increases represent a total revenue increase of $911,680 over the four years.

**Table 3: Projected increase in annual revenue from notice fees**

| Period | Proposed fee per notice | Projected increase in annual revenue* |
|---|---|---|
| 2008–09 | $320 | $0 |
| 2009–10 | $433 | $198,880 |
| 2010–11 | $444 | $19,360 |
| 2011–12 | $455 | $19,360 |
| 2012–13 | $466 | $19,360 |

* The revenue increase is split between DECC and local councils.

The new Regulation also provides benefits such as:

[10] This assumption is based on a survey of local councils undertaken as part of implementing the *Protection of the Environment Operations (Amendment) Act 2005*. DECC received local council input on the effectiveness and use of environment protection notices. For further information, see the Report to Parliament on the Review of the POEO Act and Taverner Research Company (2003) *Review of the Protection of the Environment Operations Act 1997: a report on 93 questionnaires completed by Environmental Officers of the Councils of NSW*, prepared for the NSW EPA.

- simplicity – CPI indexation is a simple process that can be used to recover the cost of issuing clean-up, prevention and noise control notices without having to continually amend the Regulation.
- consistency – indexing clean-up, prevention and noise control notice fees to CPI is a common practice used in other government organisations to ensure that the revenue base is not eroded by the costs of inflation. For example, in Victoria the service fee for pollution abatement notices is $430 and is indexed annually to CPI under the *Monetary Units Act 2004*.
- certainty – indexing the fee to CPI is expected to encourage local councils to use the appropriate tool in response to pollution incidents since the fee level will be set to maintain cost recovery. By linking the fee to CPI, there is an incentive for local councils to issue notices as they would be able to recover their costs.

## 4.3 Summary

Recent legislative reviews have found clean-up, prevention and noise control notices to be effective tools in protecting the environment in NSW, particularly on non-scheduled premises. However, local councils have raised concerns about being able to recover the costs associated with issuing notices under the POEO Act.

As notices are often issued in response to emergency pollution incidents, for example, requiring that immediate clean-up be undertaken, they often draw on considerable local council resources. By enabling local councils and DECC to more fully recover the cost of issuing clean-up, prevention and noise control notices, the proposed amendment will strengthen the capacity of these agencies to take action to protect and restore the NSW environment.

# 5 Environment protection licence fees

This section outlines the amendments to annual licence fees.

Under the previous Regulation, the annual licence fee is made up of:

- an administrative fee based on the type and scale of licensed activity
- a load-based fee (for premises conducting specified activities) proportional to the quantity and types of pollutants discharged and the conditions of the receiving environment.

Schedule 1 of the 1998 Regulation identified activities subject to the LBL scheme which is based on the polluter pays principle. Under the scheme, load fees increase with the quantity and harmfulness of emissions. The load-based fee is calculated as a function of the following components:

- the assessable load (AL) for each 'assessable pollutant', which must be determined in order to calculate the total load fee for any licence year
- the pollutant weighting (PW), which accounts for the impact of the pollutant
- the pollutant critical zone (CZ) weighting, which accounts for the sensitivity of the receiving environment
- the pollutant fee unit (PFU), which is the dollar value used in the load fee calculation formula for any licence fee period.

The Regulation set out the method of calculating the load-based fee and a fee rate threshold (FRT) which is a reasonably achievable discharge level. If the assessable load is greater than the FRT, the fee rate doubles for the assessable load greater than the FRT. The FRT provides a financial incentive for a licensee to minimise their assessable pollutant load.

Pollutant fees payable under the LBL scheme are illustrated in Figure 1.

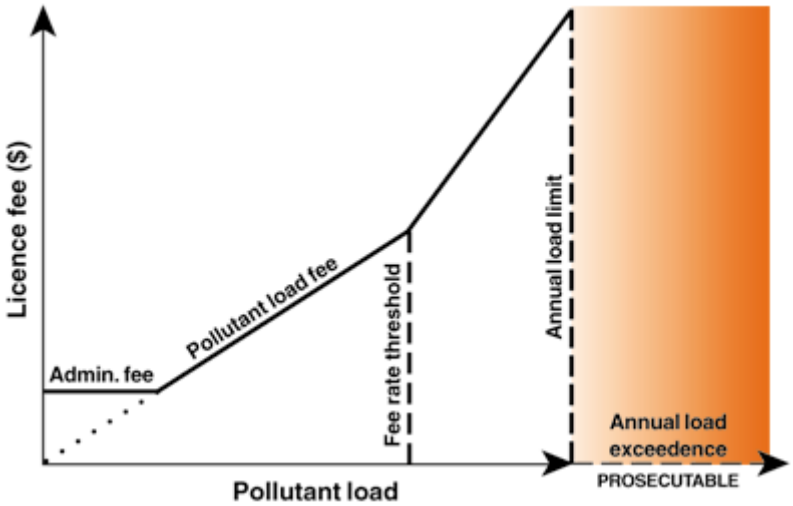


**Figure 1 Fees payable under the LBL scheme**

## 5.1 Administrative fees

The NSW Government's stated commitment to implementing the polluter pays principle extends to include the recovery of administrative costs from polluters.[11] That is, revenue is generated through fees to recover the costs of administering and implementing licences (the administrative fee).

The 1998 Regulation required that all environment protection licence holders pay an administrative fee based on the type and size of the licensed activity. The administration fee unit (AFU) was set with regard to the cost of administering environment protection licences. The AFU of $95 was in place from 2000 until 1 July 2007 when it was increased to $100 as part of a partial CPI catch-up.

The review of the Regulation found that licence administration is operating effectively and recommended no changes to the basic licensing approach for the new Regulation. However it was recognised that the revenue collected from licence administrative fees (expected to be approximately $12.8 million in 2007–08) only represents a partial recovery of the costs incurred by DECC ($25 million). While DECC has introduced a more risk-based approach to managing environmental protection licences which is considered to have reduced the difference in costs associated with licence administration and the actual revenue collected through licence administrative fees.

Revenue from licence administrative fees does not achieve full cost recovery. It is important that administrative fees are increased to recover the real cost of licence administration. In this discussion, revenue from load fees has not been included because they are an incentive to reduce pollutant emissions. Therefore, they should not be considered as part of the cost recovery mechanism since the best case scenario is that revenue from load fees would decrease each year as industry implements cleaner production practices and reduces emissions, and therefore reduces their LBL fees.

The objective of this amendment was to allow DECC to continue environment protection licensing and maintain the level of cost recovery and licence fees.

### 5.1.1 Options considered

Two options for amending the administrative fees payable for holding an environment protection licence were considered:

Option 1 – no change (base case)

Option 2 – adjust the AFU annually, based on projected annual CPI increases over the term of the proposed Regulation.

Under option 1, the AFU would remain at its current rate of $100 for the five years of the new Regulation. This option does not meet the objective of maintaining cost recovery of administering the licence system for DECC, nor for maintaining the real cost of licence fees for industry.

[11] OECD (1996), *Integrating Environment and Economy: Progress in the 1990s*, Organization for Economic Cooperation and Development, Paris. p22: 'The [polluter pays principle] is extended [in 1975, 1978] to include the allocation of government's administrative costs to polluters.'

The changes to the AFU for option 2 based on annual CPI projections of 2.5% for 92,250 licences are outlined in Table 4. The data highlights that the AFU increases by two CPI estimates (i.e. $5 or 5%) in 2009–10 to adjust for the lack of change in 2008–09.[12] The AFU amounts are rounded to the nearest dollar in order to simplify licence administrative payments which are based on the number of AFUs (as an integer) payable for each activity at an appropriate unit of measure such as production or capacity.

**Table 4: Proposed amendments to the administrative fee unit**

| Period | Administrative fee unit[a] | Annual increase in total revenue[b] |
|---|---|---|
| 2007–08 | $100 | $0 |
| 2008–09 | $100 | $0 |
| 2009–10[c] | $105 | $461,200 |
| 2010–11 | $108 | $276,700 |
| 2011–12 | $110 | $184,500 |
| 2012–13 | $113 | $276,700 |

[a] NSW Treasury (2006) 2006–07 Budget Paper. Budget Statement (Chapter 6) projects CPI as 2.5% per annum.
[b] It is assumed that the increase in fees has no impact on the number of licences.
[c] Two CPI estimates are applied (2 x 2.5%) to adjust for the absence of a CPI increase to the AFU in the 2008–09 period.

Option 2 is the preferred option since by linking the payment to CPI it maintains the value of the administrative fees in real terms and maintains cost recovery for DECC's administration of the licensing system while offering clear indication to all licensees of their likely licence fees over the next five years.

### 5.1.2 Costs and benefits of the amendment

Indexation of the AFU to CPI will result in the increase of licence fees paid by industry regulated by the POEO Act by approximately 2.5% per annum over the five years of the Regulation. The expected total administrative fee revenue from licensees not in the LBL scheme for 2007–08 is $9.2 million.[13]

The amendment will maintain partial recovery of the cost to DECC of administering the Regulation. Since licence administrative fees are designed based on the type and the size of the activity and are set to recover the costs of administering those licences, gradual AFU increases linked to CPI will avoid eroding the fee base and support the continued administration of the licensing system while also maintaining the 'real' cost of an environment protection licence for licence holders.

CPI indexation is a simple process that can be used to secure DECC's licensing revenue without having to continually amend the Regulation. The indexing of fees to CPI is used to ensure licensing revenue in other government agencies is not eroded by inflation; for example the waste levy under the Protection of the Environment Operations (Waste) Levy Regulation 2005, motor vehicle tax under the *Motor Vehicles Taxation Act 1988*, and the *Monetary Units Act 2004* (Victoria) provide for licence fee units to be converted to monetary values in line with the CPI.

[12] Note that increases to licensing fees have previously been applied in line with the financial year.
[13] The estimated administrative fee increase is based on licensees who currently pay an administration fee only, that is they are not subject to load fees as part of the LBL Scheme.

There are very minor costs to government in the amendment. These involve providing support and advice to licensees and making changes to the licensing database and industry guidance materials to implement the changes each year. However, these costs are minor and will be absorbed by the additional revenue generated by the annual AFU increases.

### 5.1.3 Summary

If there were no change to the licence AFU, licensing revenue would be eroded by increases in CPI and the gap between full and actual (partial) cost recovery would increase. The amendment offers a simple method of ensuring that licence administration costs move generally in line with the costs of administering these licences, consistent with recommendations of the National Competition Policy review.[14] This proposal is also consistent with revenue administration in other jurisdictions.

## 5.2 Pollutant fee unit

Under the LBL scheme, licensees who conduct specific fee-based activities pay pollutant load fees proportional to the quantity and types of pollutants discharged and the conditions of the receiving environment. The PFU is one of the parameters used to calculate pollutant fees.

Table 5 shows that the PFU was incrementally increased to $35 over the first years of the program to aid transition. The PFU was increased by 5% from 1 July 2006 as part of a partial CPI catch-up for load and administrative fees.

**Table 5: Pollutant fee unit amount**

| Period | Pollutant fee unit |
|---|---|
| 1999–2000 | $0 |
| 2000–2001 | $24 |
| 2001–2002 | $29 |
| 2002–2006 | $35 |
| 2006–2007 | $36.75 |

The objective of this amendment is to ensure pollutant fees continue to provide an incentive to reduce emissions.

### 5.2.1 Options considered

Three options have been considered for setting the PFU:

Option 1 – no change to the PFU (base case)

Option 2 – determine the pollutant fee based on the external costs of assessable pollutants to the community

Option 3 – amend the Regulation to automatically index the pollutant fee unit to projected CPI.

[14] health.gov.au/internet/main/publishing.nsf/Content/pharmacy-ncpr-index

Under option 1, it is expected that annual revenue from LBL fees received from licensees would continue at the $34.9 million expected for the 2007–08 period. Maintaining the PFU at its current level would, over time, reduce the incentives for industry to reduce pollutant emissions. Therefore, option 1 clearly does not address the objective of ensuring that pollutant fees continue to provide an incentive to reduce emissions.

It should be noted that option 1 would not exclude changes being made to the PFU on an ad hoc basis by amendment regulations at any time as occurred as part of the Protection of the Environment Operations (General) Amendment (Licensing Fees) Regulation 2007 where the PFU was increased from $35 to $36.75. However, it is considered that there is more benefit in providing industry with clarity on future LBL fee increases so that they can be included in plans to implement pollution reduction measures.

Basic economic principles suggest there would be merit in setting the pollutant load fees to reflect the impact of each pollutant on the environment as proposed by option 2. It could also be argued that this approach would most accurately reflect the polluter pays principle. However, there are substantial data requirements that need to be met prior to its implementation.

Table 6 provides a range of estimated external (health) costs for a number of selected air assessable pollutants and shows the broad range of external costs determined by different studies for the same pollutant. For example, there is a ten-fold range in the estimate for external costs for fine particulates. The data illustrates the difficulty in setting fees based on the external cost because the fee may be set either above the level considered appropriate to compensate society for the impacts of pollution or at a cost considered to impose an unfair burden on licensees. The data range indicates that a fee level cannot be confidently set based on a specific external cost of pollution estimated due to the absence of comprehensive information on the external costs of pollution at this time.

**Table 6: Comparison of LBL pollutant fee with external cost for selected air pollutants**

| Air pollutant[a] | LBL fee per tonne | External cost per tonne[b] |
|---|---|---|
| $NO_x$ | $33 – $1,158 | $3,100 – $22,400[c] |
| $PM_{10}$ | $459 | $31,500 – $267,300[d] |
| VOCs | $24 – $849 | $1,800 – $14,900[e] |

[a] $NO_x$ – nitrogen oxides; $PM_{10}$ – particulates up to 10 µm diameter; VOCs – volatile organic compounds

[b] Cost estimates have been converted to Australian currency (where required) and adjusted for CPI to provide a health cost for 2008.

[c] The $NO_x$ external cost range is based on Australian[15] and European Commission[16,17] studies of the ozone-related health costs of $NO_x$ emissions.

[d] Department of Environment and Conservation (NSW) data[18]

[e] Based on European Commission studies[17,18] of the ozone-related health costs of VOCs emissions.

[15] Coffey Geosciences Pty Ltd (2003) Fuel quality and vehicle emissions standards cost benefit analysis prepared for MVEC Review of vehicle emissions and fuel standards post 2006, October 2003.

[16] Holland, M. and Watkiss, P. (2002) *Benefits table database: estimates of the marginal external costs of air pollution in Europe, V E1.02a*. ec.europa.eu/environment/enveco/air/pdf/betaec02a.pdf.

[17] Holland, M., Pye, S., Watkiss, P., Droste-Franke, B. and Bickel, P. (2005) *Damages per tonne emissions of PM2.5, NH3, NOx, and VOCs from each EU25 Member State (excluding Cyprus) and surrounding seas*, March 2005, www.cafe-cba.org/assets/marginal_damage_03-05.pdf.

[18] DEC (2005) *Pollution Economics: Health Costs of Air Pollution in the Greater Sydney Metropolitan Region*, www.environment.nsw.gov.au/resources/air/airpollution05623.pdf.

A further difficulty in this option is that the economic rationale for this approach applies to the actual pollutant load fee, rather than the PFU. The pollutant load fee payable by LBL scheme licensees is made up of several components as shown in Appendix 1. Since the PFU does not determine the pollutant load fee in isolation from these other components, the external cost of pollutants could be levied on licensees more than once (for example, where some portion of the external cost is already included in the pollutant critical zone weightings or pollutant weightings).

Given these concerns and difficulties, option 2 is not the preferred option currently. It appears more appropriate to consider the link between the external costs representing the impacts of different pollutants with the other aspects of the LBL scheme such as linking appropriate assessable pollutants with fee-based activities, and changes to critical zone weightings and pollutant weightings. These issues are discussed in section 6.

Option 3 proposes to amend the Regulation to automatically index the PFU to projected CPI over the term of the proposed Regulation. Table 7 shows the proposed PFU over the next five years and highlights a 5% increase in PFU in 2008–09 to make up for the lack of increase in 2007–08. This option provides all LBL scheme licensees clear indication of the likely impact on their LBL fees over the next five years and maintains the value of the PFU in real terms by linking the fee to CPI. This will ensure the relevance of the LBL scheme as pollutant fees will continue to provide an incentive to reduce emissions. For this reason option 3 is the preferred option.

**Table 7: Proposed amendment to the pollutant fee unit**

| Period | Proposed PFU[a] | Projected increase in total annual revenue[b] |
|---|---|---|
| 2007–08 | $36.75 | $0 |
| 2008–09 | $38.61[c] | $1,776,000 |
| 2009–10 | $39.58 | $921,000 |
| 2010–11 | $40.57 | $944,000 |
| 2011–12 | $41.58 | $968,000 |
| 2012–13 | $42.62 | $1,039,000 |

[a] NSW Treasury (2006) 2006–07 Budget Paper – Budget Statement (chapter 6) estimates CPI as 2.5% per annum.

[b] Revenue changes are not realised until the reporting period following implementation.

[c] Two CPI estimates are applied (2 x 2.5%) to adjust for the absence of a CPI increase to the PFU in the 2007–08 period.

### 5.2.2 Costs and benefits of the amendment

Linking the PFU to CPI is expected to result in an average increase in pollutant load fees (i.e. from licensees paying LBL fees) of 2.5% per annum based on an assumption that pollutant loads are consistent. The amendment provides an across the board increase to all licensees who pay an LBL fee. Based on the expected revenue in 2007–08 of $34.9 million, the increase in the PFU would be expected to increase LBL revenue by approximately $900,000 per annum with the increase spread evenly across the 280 LBL licensees.

The costs to individual LBL licensees is expected to be 2.5% per annum assuming that production and emission levels do not change. Costs to government are minor,

involving simple changes to information management systems in order to facilitate the annual changes to PFUs and Annual Returns.

The major benefit of the proposal is the simplicity of implementation and the transparency of future fee increases for stakeholders. CPI indexation is a simple process that can be used to ensure that LBL fees maintain their 'real' value without having to continually amend the Regulation. Further, it is common for government legislation to maintain the real value of charges as outlined in section 5.1.2. Since it is critical to maintain the incentive in LBL to ensure the scheme is successful, linking PFU with CPI is a simple method to maintain the current incentive for participants, since LBL costs would erode in value over time without such a measure being put in place.

### 5.2.3 Summary

To maintain the incentive currently provided by pollutant load fees in 'real' terms (i.e. not eroded by CPI), continual increases are needed to the fee level to maintain the incentive for licensees to reduce pollution in a cost effective and timely manner. The amendment links PFU increases to CPI over the next five years and provides industry with clarity on future LBL fee increases so that industry is able to incorporate this cost information into decision making on future expenditure.

The amendment does not place a cost burden on licensees to the extent that a pollutant load fee based on estimated actual external costs of pollutants would, as discussed in option 2. It provides for the continuation of the LBL scheme as an incentive for pollution abatement and allows future refinement in the way that fees are set.

The PFU forms only part of the calculation used to determine a licence holder's actual pollutant load fee. Where data from the operation of the LBL scheme to date supports the need for a greater incentive in the proposed Regulation, this can be achieved by amending one or more components of the pollutant load fee (as described in section 6). The subsequent sections of this document assess potential amendments to these other components of the fee.

# 6 Changes to the load-based licensing scheme

The LBL scheme applies the polluter pays principle which is a mechanism to control, reduce and prevent pollution. The fundamental feature of the approach of LBL is the use of pollutant 'load' (the amount of pollutant emissions in kilograms) discharged as the basic unit of measure, rather than the pollutant concentration. LBL focuses on the total amount of pollution emitted per year and the LBL fee is calculated on the potential environmental impact of that pollution. It offers polluters an incentive to reduce their fees by reducing their pollutant loads.

The requirement for licensees to report the emitted load of specified assessable pollutants under the LBL scheme:

- ensures licensees are informed about the types and loads of pollutants arising from their activities
- provides a transparent and clear basis for calculating pollutant fees
- allows DECC to collect information about the types and loads of pollutants being discharged into the environment from specific premises and fee-based activities (i.e. industry sectors), which helps inform policy and program development.

Appendix 2 contains a short summary of the environmental impact of each of the LBL assessable pollutants.

The pollutant load fee (or LBL fee) is based on the *amount* of pollution (the pollutant load), how *harmful* it is, and the sensitivity of the receiving environment (*where* it is released). Licensees who are subject to LBL only pay an LBL fee when the sum of their assessable pollutant load fees is higher than the administrative fee (i.e. the administrative fee is the minimum licence fee payable under LBL).

For more detailed information on LBL and how fees are calculated see the *Guide to Licensing* at www.environment.nsw.gov.au/licensing/licenceguide.htm or the summary in Appendix 1.

Schedule 1 of the Regulation sets out the fee-based activities that are part of LBL; that is, those activities that have assessable pollutants and associated FRT factors. The following selection criteria[19] were used when the LBL scheme was developed to determine which assessable pollutants apply to each fee-based activity:

- The potential of the pollutant to cause serious environmental harm is known and well understood.
- The nature of environmental harm caused is considered compatible with the load based approach.
- Robust pollutant measurement techniques are available.
- The industry is known to have significant discharges of the pollutant.

This section outlines the proposed amendments to the LBL scheme for specific fee-based activities which aim to address the above criteria.

In reviewing the LBL scheme, DECC considered all aspects of the scheme including assessing whether the pollutant weightings, critical zone weightings and FRT factors were set at appropriate levels and whether all significant industrial sources of

[19] EPA (1998) *Regulatory Impact Statement for the proposed Pollution Control Regulation 1998*, p 28.

pollutant emissions in NSW were captured by the scheme. This assessment has led to the following proposed amendments to the LBL scheme:

1. adding additional assessable pollutants to some fee-based activities to improve the LBL coverage of significant industrial emission sources in NSW
2. removing the assessable pollutants listed for cement or lime handling
3. adding assessable pollutants to some fee-based activities that currently do not have assessable pollutants listed
4. adding a production threshold to the activity of petroleum and fuel production below which assessable pollutants do not apply
5. amending or adding FRT factors in order to ensure that they provide an incentive to poorly performing licensees.

Each of these amendments is discussed further below.

Appendix 3 contains a summary of the fee impacts of the proposed changes to each of the LBL fee-based activities over the five years of the Regulation. It should be noted that where a licensee conducts multiple activities, the fee impacts from all fee-based activities have been assigned to the fee-based activity that is considered to contribute the greatest portion of the LBL fee. This means that there may be some inconsistency between the discussion of fee impacts and the total revenue projection outlined in Appendix 3.

## 6.1 Adding additional assessable pollutants to LBL activities

It is important that pollutant load fees are paid by all significant industrial emitters of assessable pollutants in NSW so that the economic incentive to reduce emissions is applied equitably. Adding an assessable pollutant to one or more LBL fee-based activities means that the pollutant load fee provides an incentive for the licensee to consider investing in equipment and/or practices to reduce emissions, and consequently their load based fee.

A review of the coverage of the then LBL assessable pollutants was undertaken. This was done by comparing the total load reported for each assessable pollutant from all LBL premises with total emissions reported to the NPI. Broadly, the NPI covers a greater range of industry sectors than LBL and so provides information on a greater range of sources. DECC could thereby assess whether any significant emitters of assessable pollutants were not currently required to pay LBL pollutant load fees for those emissions.

Through this review it was found that significant industrial emission sources of arsenic, lead and mercury are not being captured by LBL and therefore are not subject to an incentive mechanism to reduce emissions. This information is discussed below.

### Arsenic

Arsenic is an assessable air pollutant under the LBL scheme for three fee-based activities:

- non-ferrous metal production (ore concentrates)
- thermal treatment of general waste

- thermal treatment of hazardous and other waste.

A review of three years of NPI data from 2002–2005 indicated that the LBL scheme does not capture some of the more significant air point-source emissions of arsenic in NSW. The review found that arsenic emissions from industrial premises reporting to the NPI were initially about 2,000 kg per annum, but dropped to around 1,000 kg for 2004–05 after the closure of two large premises. This resulted in the LBL coverage of industrial arsenic emissions dropping from 60% in 2002–03 to only 0.1% in 2004–05. This reveals a significant gap in the coverage of arsenic emissions by LBL.

Table 8 identifies those LBL activities with high arsenic emissions that *do not* pay load fees on their emissions. It shows that the fee-based activities identified all emit significant quantities of arsenic to the environment every year.

**Table 8: LBL activities that report significant arsenic air emissions to the NPI but do not pay load fees**

| Fee-based activity[a] | Average annual arsenic emissions for 2002–05 (kg) | Total NSW industrial arsenic emissions for 2002–05 (%) |
|---|---|---|
| Coke production | 194 | 12.9 |
| Electricity generation from coal | 191 | 12.7 |
| Glass production – container glass | 100 | 6.7 |
| Iron and steel production (iron ore) | 70 | 4.7 |
| Petroleum and fuel production[b] | 37 | 2.5 |
| Iron and steel production (scrap metal) | 35 | 2.3 |
| **Total** | | **41.8** |

[a] Where a licensee undertakes multiple activities on a site, NPI emissions data has been assigned to the activity considered to result in the greater portion of those emissions.

[b] The number of licensees does not include those that have a capacity to produce less than 10,000 tonnes. This is as per the recommendation in section 6.4 to remove assessable pollutants for these premises.

For the remaining point-source arsenic emissions reported to the NPI for 2002–2005:

- 39% was emitted by two major premises with arsenic as an assessable pollutant that ceased operations in 2004 and so are no longer relevant
- 19% comes from a large number of small emitters which include but are not limited to activities not in the LBL scheme, such as agricultural produce industries, explosives manufacture, livestock processing and wood or timber milling activities
- The remainder was emitted by the LBL premises that currently have arsenic as an assessable pollutant, such as those that conduct thermal treatment of hazardous and other waste.

### Lead

Lead is an air assessable pollutant under the LBL scheme for seven fee-based activities:

- non-ferrous metal production (ore concentrates)
- non-ferrous metal production (scrap metal)
- energy recovery from general waste

- energy recovery from hazardous and other waste
- recovery of waste oil
- thermal treatment of general waste
- thermal treatment of hazardous and other waste.

A review of the 2002–2005 NPI data indicated that the LBL scheme does not capture some of the more significant industrial air point source emissions of lead in NSW. Lead emissions from industrial premises reporting to the NPI were 30,700 kg in 2002–03, but this value dropped to around 10,000 kg in 2004–05 after the closure of two major premises. LBL premises conducting the activities listed above contribute only 8% (or 770 kg) of lead emissions reported from point sources to the NPI.

Table 9 details those LBL activities in the NPI with high lead emissions that *do not* pay load fees on their emissions. It shows that these activities often emit an average of several hundred kilograms of lead to the air every year.

**Table 9: LBL activities that report high lead air emissions to the NPI but do not pay load fees**

| Fee-based activity[a] | Average annual lead emissions for 2002–05 (kg) | Total NSW average lead emissions for 2002–05 (%) |
|---|---|---|
| Iron and steel production (iron ore) | 7,200 | 41.9 |
| Electricity generation from coal | 890 | 5.2 |
| Glass production – container glass | 650 | 3.8 |
| Coke production | 490 | 2.8 |
| Cement or lime production | 460 | 2.7 |
| Petroleum and fuel production[b] | 410 | 2.4 |
| Iron and steel production (scrap metal) | 220 | 1.3 |
| Aluminium production (alumina) | 110 | 0.6 |
| **Total** | | **61.7** |

[a] Where a licensee undertakes multiple activities on a site, NPI emissions data has been assigned to the activity considered to result in the greater portion of those emissions.

[b] The number of licensees in this activity does not include those premises that have a capacity to produce less than 10,000 tonnes. This is as per the recommendation in section 6.4 to remove assessable pollutants for these premises.

For the remaining point source lead emissions reported to the NPI for 2002–2005:

- 29% was emitted by premises that have now ceased operation
- 4% was emitted by premises that currently have lead as an assessable pollutant
- 6% comes from a large number of small emitters which include but are not limited to ceramics production, petrochemical production, livestock processing industries, paper production and wood or timber milling activities.

### Mercury

Mercury is an assessable air pollutant under the LBL scheme for the following three fee-based activities:

- non-ferrous metal production (ore concentrates)
- thermal treatment of general waste
- thermal treatment of hazardous and other waste.

A review of the 2002–2005 NPI data indicated that the LBL scheme does not capture some of the more significant air point-sources of mercury in NSW. The review found that mercury emissions from point sources at industrial premises reporting to the NPI averaged at about 1,600 kg per annum and that the initial low coverage of these mercury emissions by LBL dropped to zero in 2004–05.

Table 10 details the LBL activities with high mercury emissions that *do not* pay load fees on their emissions. It shows that these activities discharge an average of 70–520 kg of mercury to the environment every year.

**Table 10: LBL activities that report high mercury emissions to the air to the NPI but do not pay load fees**

| Fee-based activity[a] | Average mercury emissions (kg) | Total average mercury emissions (%) |
|---|---|---|
| Coke production | 520 | 30 |
| Electricity generation from coal | 310 | 18 |
| Iron and steel production (iron ore) | 210 | 12 |
| Cement or lime production | 100 | 5.8 |
| Petroleum and fuel production[b] | 70 | 4.3 |
| Iron and steel production (scrap metal) | 65 | 3.8 |
| **Total** | | **74** |

[a] Where a licensee undertakes multiple activities on-site, NPI emissions data has been assigned to the activity considered to result in the greater portion of those emissions.

[b] The number of licensees in this activity does not include those premises that have a capacity to refine and manufacture less than 10,000 tonnes. See Section 6.4 for the recommendation to remove assessable pollutants for these premises.

For the remaining point source mercury emissions reported to the NPI for 2002–2005:

- 7% came from a number of small emitters which include glass production, petrochemical production, livestock processing industries and paper production.
- 1% was emitted by premises that had mercury as an assessable pollutant but have since closed down; and
- 18% was emitted by premises conducting waste activities. Currently, fee-based activities associated with waste activities are not in the LBL scheme. At this time, DECC does not recommend including such activities in the LBL scheme and will continue to regulate emissions through licence conditions and other regulatory tools.

### 6.1.1 Options considered

The purpose of this amendment was to ensure the LBL scheme captures the most significant industrial emissions, where this is technically feasible and practical, so that licensees have an incentive to reduce their emissions.

Two options for adding additional assessable pollutants to some scheduled activities were considered:

Option 1 – no change (base case)

Option 2 – add arsenic, lead and mercury as assessable pollutants to some existing fee-based activities in the LBL scheme where analysis indicates that the coverage of significant emissions sources could be improved.

As discussed above, LBL currently only captures a small percentage of total industrial emissions for arsenic, lead and mercury. Under option 1, the LBL coverage of these emissions would remain low and there would be no incentive for the LBL premises that have been identified as having significant emissions of these pollutants (but do not currently have them as assessable pollutants) to reduce their emissions of these substances. Therefore, option 1 did not meet the objective of capturing the most significant industrial sources of pollution.

Option 2 proposed to add arsenic, lead and mercury as assessable pollutants to the LBL fee-based activities that have been identified in the analysis as emitting significant quantities of the pollutants. Table 11 outlines the activities in the LBL scheme for which it is proposed to add arsenic, lead and mercury added as assessable pollutants.

**Table 11: Proposed assessable pollutants to be added to existing fee-based activities under the LBL scheme**

| Fee-based activity | Arsenic | Lead | Mercury |
|---|---|---|---|
| Cement or lime production | | ✓ | ✓ |
| Coke production | ✓ | ✓ | ✓ |
| Electricity generation from coal | ✓ | ✓ | ✓ |
| Glass production – container | ✓ | ✓ | |
| Iron and steel production (iron ore) | ✓ | ✓ | ✓ |
| Iron and steel production (scrap metal) | ✓ | ✓ | ✓ |
| Petroleum and fuel production | ✓ | ✓ | ✓ |

The changes in Table 11 are projected to improve the LBL coverage of industrial emissions of these pollutants in NSW by the amounts in Table 12. The data illustrates the very strong case for option 2 which would significantly improve coverage by adding additional assessable pollutants to specific fee-based activities. The remaining portion of industrial emissions of these pollutants are reported to the NPI by premises that are not subject to LBL.

**Table 12: Projected LBL coverage of arsenic, lead and mercury point source emissions in NSW**

| Assessable pollutant | Coverage of industrial emissions[a] | |
|---|---|---|
| | Option 1 | Option 2 |
| Arsenic | 0.1% | 60% |
| Lead | 8% | 91% |
| Mercury | 0.02% | 77% |

[a] Based on 2004–05 NPI and LBL data

### 6.1.2 Costs and benefits of the amendment

The main costs to industry of the amendment relate to additional costs of reporting the new assessable pollutants, which may include monitoring costs, plus the additional pollutant fees payable on their emissions.

The possible monitoring costs associated with arsenic, lead and mercury are highly variable across production systems and it has not been possible to estimate them because of limited information. In particular, it is difficult to determine monitoring costs for these pollutants because:

- The cost of air pollution emissions monitoring is highly variable depending upon the configuration of the production processes. For example, large-scale plants with emission stacks extending across a wide land area will require multiple monitoring sites.
- The actual costs for each premises depends on what else is being monitored at the same time, for example other heavy metals.

*It should be recognised that premises will not necessarily be required to monitor for these new assessable pollutants.* Since this proposal was based on an analysis of NPI data, the majority of the premises in each fee-based activity are already reporting emissions of the pollutant to the NPI using monitoring or, more likely, an emission factor. Given that the then NPI reporting method would likely be applicable for LBL purposes, reporting the pollutant might not necessarily lead to additional data-gathering or monitoring costs for the premises.

The increased pollutant load fees associated with the amendment were more easily established. Table 13 outlines the projected impact on load fees from adding arsenic, lead and mercury as assessable pollutants to the proposed LBL activities.

DECC will receive information on these additional assessable pollutants in the Annual Returns submitted by affected licensees. Processing the information from the proposed amendment will require minimal additional administration costs for DECC since the Annual Returns are currently subject to a compliance check of the completed LBL worksheets for existing assessable pollutants.

There are a number of benefits from the amendment, such as improved emissions information or reduction in emissions. For example:

- The amendment would increase the amount of emissions data that can be used to develop pollution reduction programs or to inform wider DECC policy and program development at the local or regional level since some of the premises in the fee-based activities do not currently report emissions of each pollutant to the NPI (although the majority of the premises do). NPI facilities only report emissions where they trip a relevant threshold, whereas all LBL premises that conduct a fee-based activity must report all assessable pollutants for that activity.
- Linking emissions of the pollutants to fees might lead to some premises looking to improve the accuracy of the emissions data that they currently report to the NPI by either monitoring or developing a site-specific emission factor.
- The amendment would provide an economic incentive for those premises that were previously not required to pay load fees for emitting arsenic, lead and mercury to reduce their emissions where possible. Reduced emissions can lead to secondary benefits such as avoided health and environmental costs that can arise from emissions of these pollutants.

**Table 13: Impact of adding the air assessable pollutants lead, arsenic and mercury to LBL fee-based activities in 2009–10**

| Fee-based activity [a] | Baseline LBL fee | Projected load fees | | | | Projected additional LBL fee | Increase in baseline LBL fee (%) |
|---|---|---|---|---|---|---|---|
| | | Arsenic | Lead | Mercury | | | |
| Aluminium production (alumina) | $475,000 | – | $5,000 | – | | $5,000 | 1% |
| Cement or lime production | $409,000 | – | $19,000 | $41,000 | | $60,000 | 15% |
| Coke production | $57,000 | $39,000 | $21,000 | $218,000 | | $278,000 | 490% |
| Electricity generation from coal | $14,300,000 | $41,000 | $42,000 | $139,000 | | $222,000 | 2% |
| Glass production – container glass | $709,000 | $25,000 | $34,000 | – | | $59,000 | 8% |
| Petroleum and fuel production[b] | $2,592,000 | $7,000 | $11,000 | $71,000 | | $89,000 | 3% |
| Iron and steel production (iron ore) | $4,150,000 | $13,000 | $206,000 | $104,000 | | $323,000 | 8% |
| Iron and steel production (scrap metal) | $139,000 | $7,000 | $9,000 | $26,000 | | $42,000 | 30% |
| **Total** | | **$132,000** | **$347,000** | **$599,000** | | **$1.1 million** | |

[a] Where a premises conducts multiple fee-based activities, the estimated load and projected load fees have been assigned to a single fee-based activity for simplicity since the breakdown of the reported NPI emission for the whole site is not known.

[b] Fee calculations for petroleum do not include those premises with a threshold below 10,000 tonnes (section 6.4).

### 6.1.3 Summary

An analysis of the coverage of the LBL scheme with total industrial pollutant emissions in NSW identified that significant emission sources of arsenic, lead and mercury are not captured by the LBL scheme. Consequently, there is a lack of equity for some major industrial emitters of these pollutants. These industrial emitters have no economic incentive to reduce emissions levels below compliance whereas other premises involved in the LBL scheme pay fees on their emissions. In order to address this lack of equity and improve the operation of the LBL scheme the preferred option was to add the assessable pollutants arsenic, lead and mercury to the fee-based activities set out in Table 14, as for option 2.

### 6.1.4 Further discussion – other new assessable pollutants

DECC examined other pollutants of national interest that are not LBL assessable pollutants, such as those under the NPI or the National Environment Protection Measure for Ambient Air Quality, to assess whether they should be added to the LBL scheme. The review of major industrial sources of these pollutants of concern indicated that LBL already provides a reasonable coverage of these pollutants or indicator pollutants. For example, the LBL scheme currently includes several air toxics as assessable pollutants (for example arsenic, lead, mercury, benzene, VOCs and BaP) with dioxins[20] being the only significant class of air toxics not currently included in the LBL scheme.

In addition the review found that currently the benefits of adding additional pollutants such as dioxins or $PM_{2.5}$[21] to the LBL scheme are not clear due to unreliable methodology for calculating emissions or increased cost burden on licensees to monitor and report on emissions without providing a substantial benefit to the environment. However, it should be noted that DECC may regulate emissions of these and other pollutants through licence conditions and under the Clean Air Regulation.

DECC will continue to review the suitability and applicability of adding additional assessable pollutants above those proposed in this Regulation in the future.

## 6.2 Removing assessable pollutants listed under cement or lime handling

Cement or lime handling typically involves crushing, grinding and bagging cement and lime ready for distribution. These materials are used in concrete production and other building materials. In contrast to cement or lime handling, cement or lime production is a high-risk activity because it involves combustion and complex processes using chemical additives. For cement or lime production, electrostatic precipitation and scrubbing is generally used to control air emissions, especially particulates.

There are 15 premises that have cement or lime handling as their *only* LBL fee-based activity. The combined administrative fees for these licenses amount to $39,200 while the combined load fees amount to about $1,500. None of these

[20] Dioxins are a group of compounds that are structurally and chemically related to polychlorinated dibenzo-*para*-dioxins (PCDDs) and polychlorinated dibenzofurans (PCDFs).
[21] $PM_{2.5}$ is particulate matter 2.5 micrometres in diameter or less.

licensees pay LBL fees because their emissions of the assessable pollutants – coarse and fine particulates – are relatively small and therefore they only pay administrative fees.[22]

Producers involved in this activity have an incentive to reduce particle emissions because it maximises the amount of product they can sell. That is, cement and lime that is lost in particulate emissions causes a direct loss of revenue.

In 2004–05, the combined particulate load (coarse and fine particulates) from cement and lime handlers was around 10 tonnes, which is less than 0.1% of total particulate emissions reported to the LBL scheme. DECC does not expect the cement and lime handling industry to expand its production levels significantly in the future, nor does it expect the industry sector's capture of particulate emissions to decrease given the direct impact on profits. Therefore, the current level of particulate emissions is not expected to increase in the foreseeable future.

Taking the points raised above into account, it is clear that the LBL scheme is not providing any additional economic incentive to improve environmental performance.

### 6.2.1 Objective

The strength of the economic incentive in LBL is directly related to the magnitude of the LBL fees. When the total assessable pollutant fee is less than the administrative fee, the LBL fee equals zero. Where this occurs, LBL does not provide an incentive to reduce pollutant loads. It also implies that the premises/industry sector does not have significant discharges of the pollutants – one of the criteria for inclusion in the scheme. In such a situation, LBL may not be the appropriate tool to encourage pollution reduction in these industries.

Given this, it is clear that maintaining cement or lime handling in LBL is providing no incentive for these premises to improve their environmental performance.

The amendment removes assessable pollutants listed under cement or lime handling in the Regulation, thereby removing this fee-based activity from the LBL scheme.

The objective of this amendment is to remove administrative requirements on both industry and government that provide no environmental benefits and to allocate DECC and industry resources according to the level of environmental risk.

### 6.2.2 Options considered

Two options were considered:

Option 1 – no change (base case)

Option 2 – remove the assessable pollutants – coarse and fine particulates – listed under the activity 'Cement or lime handling'.

Under option 1, premises licensed for cement or lime handling would continue to report emissions of coarse and fine particulates in their Annual Return to DECC, for the purpose of calculating pollutant load fees for these two assessable pollutants. DECC would continue to process the Annual Return which involves verifying the

[22] The POEO General Regulation requires that only the administrative or the total assessable pollutant fee be paid (whichever is higher).

accuracy of the calculation and entering data into the licensing database. Given the discussion above, it is considered unlikely that these premises would ever emit loads of coarse and fine particulates that would require them to pay LBL fees. Hence, this option maintains an administrative burden on both the licensees and government while providing no incentive for the licensees to improve environmental performance.

Under option 2, licensees would continue to complete an Annual Return but there would be no requirements to submit load data and so LBL worksheets would not be submitted to DECC. While the licensee does not have to report loads of coarse and fine particulates, environment protection licence conditions would still apply to the premises, and these license conditions require the operations to be conducted in a competent manner.

This option would result in DECC not receiving emission data from these facilities through any mechanism since they do not report to the NPI as they do not trip any of the NPI reporting thresholds. Given the very small emissions of coarse and fine particulates from these licensees, it is not considered that such a loss of data would be significant with respect to DECC's coverage of emission sources in NSW.

Therefore, option 2 was the preferred option since the objective is to remove administrative requirements on both industry and government that provide no environmental benefits. Option 1 would continue to place unnecessary administrative requirements on both licensees and government.

### 6.2.3 Costs and benefits of the amendment

The amendment will have no impact on the total fees payable by affected licensees since all the affected licensees currently pay administrative fees only and will continue to do so under the proposal. It was expected that the amendment to the Regulation would not have any impact on the levels of particulate emissions from premises that undertake this activity since it has provided no incentive to reduce emissions.

Particulate load data would no longer be collected for LBL purposes by licensees who undertake cement or lime handling and, as a result, this information would no longer be held by DECC. Currently, licensees calculate their loads using emissions factors as opposed to actual monitoring. Therefore, loads are likely to be overestimated as emission factors are generally conservative. LBL load data indicates that the proportion of particulates arising from *all cement and lime handling activities* represented less than 0.01% of total particulate emissions reported by *all LBL licensees*. Continued collection of this information was considered to offer little value in the future due to the low particulate emission levels.

There will be minor administrative costs to DECC to facilitate removal of LBL requirements for these licenses, but these costs will be offset by the reduced resources required to administer the LBL component of Annual Returns and assess compliance with LBL. DECC would not send LBL worksheets for completion to licensees as part of their annual licence renewal or conduct a compliance check of the completed worksheets. This is expected to release DECC resources to focus on higher risk premises, where more significant environmental benefits can be achieved. The costs to government to conduct these tasks are estimated as $715 per year.[23]

[23] This estimate is based on the cost to Government of 13 hours of staff time per year, valued at $55 per hour. DECC estimates that the LBL component of the licence anniversary notice for this industry currently requires one hour per licence per annum.

Industry will gain savings benefits since affected licensees would no longer have to provide load data information on an LBL worksheet and include this data in their Annual Return at the end of the licence year. The savings to industry of conducting these tasks is estimated at approximately $845 per annum.[24]

### 6.2.4 Summary

The analysis shows that the amendment would reduce the administrative burden of licensing on both licensees and the government, saving $500–1,000 annually, with no corresponding adverse impacts on the environment. While particulates are an important air quality issue in NSW, the level of particulate emissions arising from cement or lime handling operations are insignificant as a proportion of total particulate emissions for premises subject to LBL and therefore no longer appear to warrant inclusion in the LBL scheme.

Pollution reduction programs could still be required for specific poorly performing licences. In addition, DECC is able to apply concentration limits on environment protection licences to control any potential acute localised particulate impacts where necessary.

Removing the assessable pollutants listed for cement or lime handling allows DECC and industry to allocate resources that are commensurate with the level of environmental risk.

## 6.3 Adding new activities to LBL

The coverage of major industrial emissions of assessable pollutants by LBL was also examined to determine whether activities that have no assessable pollutants (that is, activities not covered by LBL) should pay load fees for specific assessable pollutants in order to improve the coverage and equity of the LBL scheme.

### 6.3.1 New LBL activity – 'Carbon black production'

One activity of interest that was identified through analysis of its significant emissions reported to the NPI was carbon black production.

Carbon black products are used as a reinforcing agent in rubber compounds (especially tyres) and as a black pigment in printing inks, surface coatings, paper, and plastics. They are created through the partial combustion or thermal decomposition of gaseous or liquid hydrocarbons (for example natural gas, coal tar oils and petrochemical oils). This process creates extremely small particles of highly dispersed elemental carbon.

Air emissions from carbon black industries include particulates, carbon monoxide, VOCs, $NO_x$, $SO_x$, PAHs and heavy metals. Gaseous air emissions can vary considerably according to the grade of carbon black being manufactured. Gaseous emissions may be controlled with carbon monoxide boilers, incinerators or flares.

[24] This estimate is based on the cost to industry of 13 hours staff time per year, valued at $65 per hour. DECC expects that licensees would spend one hour preparing the LBL documentation per year. Licensees who undertake cement and lime handling currently calculate the load fee by multiplying the emission factors (for coarse and fine particulates) provided in the *Load Calculation Protocol* with the rate of production.

A review of NPI data indicated that significant loads of assessable air pollutants were discharged by the carbon black industry in NSW. These quantities were comparable to the loads of the various assessable pollutants that are emitted by other licences that are already included within the LBL scheme.

It can be seen in Table 14 that carbon black producers emit BaP, fine particulates, $NO_x$, VOCs and $SO_x$ that exceed the median load on which LBL licensees are required to report and pay fees.

**Table 14: Comparison of median loads for carbon black producers with other LBL activities**

| Assessable pollutant | Median NPI emission reported by carbon black producers over 2000–05 (kg) | Median 2004–05 LBL load (kg) | Number of LBL premises with assessable pollutant |
|---|---|---|---|
| BaP[a] | 90 | 0.05 | 23 |
| Fine particulates | 16,000 | 1,808 | 97 |
| $NO_x$ | 390,000 | 15,538 | 83 |
| $SO_x$ | 850,000 | 32,082 | 58 |
| VOCs | 6,900 | 3,086 | 63 |

[a] Estimated from reported PAH emissions using an average BaP:PAH ratio for petroleum refining activities of 0.0073.

In addition, carbon black production is not a fee based activity in Schedule 1 of the Regulation. Therefore, licensees that conduct this activity pay licence fees for other activities, such as chemical storage and waste activities.

### Options considered

The aim of the new Regulation was to expand the coverage of the LBL scheme so that all current significant sources of industrial emissions in NSW would be subject to an additional economic incentive to reduce emissions. Two options were considered to meet this aim with respect to carbon black production.

Option 1 – no change (base case)

Option 2 – create a new fee-based activity titled ‘Carbon black production’ with selected air assessable pollutants.

Under option 1, licensees scheduled under this activity in Schedule 1 of the POEO Act would continue to pay administrative fees under some other fee-based activity in Schedule 1 of the Regulation such as ‘Other activities being any activity not otherwise included in a classification in this Schedule’ or ‘Chemical storage activities’. Licensees would not be required to pay administrative fees for the activity undertaken at the site, nor would they be required to pay load fees for emission of pollutants that are of equivalent magnitude to premises that are currently part of LBL. Consequently, this option clearly did not meet the aim of the amendment.

Option 2 would create a new fee-based activity called ‘Carbon black production’ with associated air assessable pollutants (i.e. a new LBL fee-based activity). This proposal would include an administrative fee scale for this industry in Schedule 1 of the Regulation, which would equitably apply the polluter pays principle across all industries emitting significant amounts of environmentally harmful pollutants.

The proposed changes to Schedule 1 of the previous Regulation are highlighted in Table 15, including administrative fee scales, assessable pollutants and FRT factors. The FRT factors have been developed based on an emission factor range taken from *Dutch Notes on Best Available Technology for the Carbon Black Industry* (2002) in order to reflect good practice.

### Table 15: Carbon black production

**Administrative fee**

| Annual production capacity | Administrative fee units |
|---|---|
| Not more than 5,000 tonnes | 25 |
| More than 5,000 but not more than 20,000 tonnes | 65 |
| More than 20,000 tonnes | 165 |

**Load-based fee**

| Air pollutants | Threshold factor |
|---|---|
| Benzo[a]pyrene | 0.005 |
| Fine particulates | 0.3 |
| $NO_x$ and $NO_x$ (summer) | 11 |
| $SO_x$ | 8 |
| VOCs and VOCs (summer) | 0.4 |
| **Water pollutants** | **Threshold factor** |
| Nil | Not applicable |

The preferred option was option 2 since the objectives of this amendment would ensure the LBL scheme captures all current industrial activities that discharge a significant level of LBL assessable pollutants where this is technically feasible and practical. Option 1 would not meet this objective since it would continue the current inequity whereby carbon black producers, which have been shown to emit significant quantities of pollutants, are not required to pay load fees for their emissions nor administrative fees commensurate to their activity.

### Costs and benefits of the amendment

The main costs to industry from the amendment result from any additional administrative, pollutant monitoring and reporting costs associated with completing the data requirements for the new assessable pollutants, plus new costs associated with paying load fees for emissions of the assessable pollutants.

The premises that conduct this activity currently monitor for a variety of pollutants – $PM_{10}$, $NO_x$, $H_2S$, $SO_x$ and total suspended solids – as licence condition requirements. Given that licensees that produce carbon black are already reporting emissions of the proposed assessable pollutants to the NPI, it is reasonable to assume that no additional monitoring (or relatively minor modifications to existing monitoring regimes) would need to be conducted in order for them to comply with the proposed LBL requirements.

The other additional cost is the LBL fees associated with emissions. Table 16 outlines the estimated impact to annual load fees from adding assessable pollutants to carbon black producers for premises situated outside of the metropolitan region or in the Sydney Basin for the 2008–09 period. If the premises are situated in the Hunter or Wollongong regions, then higher load fees (to take into account the $NO_x$ and VOCs critical zone weightings) would result in LBL fees of $65,205 and $144,269 respectively.

**Table 16: Projected load fee implications for 'Carbon black production'**

| Assessable pollutant | Annual median load (kg)[a] | FRT (kg)[b] | Estimated load fee[c] | Estimated load fee in the Sydney Basin[d] |
|---|---|---|---|---|
| BaP[e] | 90 | 150 | $10,077 | $10,077 |
| $PM_{10}$ | 16,000 | 9,000 | $11,100 | $11,100 |
| $NO_x$ | 390,000 | 330,000 | $15,678 | $218,918 |
| $SO_x$ | 850,000 | 240,000 | $12,434 | $12,402 |
| VOCs | 6,900 | 12,000 | $176 | $2,462 |
| | | **LBL fee** | **$49,465** | **$254,959** |

a Based on NPI data reported over the 2000–05 reporting periods.

b Based on an actual quantity of activity equal to 30,000 tonnes production. Note that enhanced load fees are payable for fine particulates, $NO_x$ and $SO_x$ since their emission is greater than the FRT.

c Estimated load fee for a licensee outside the Sydney metropolitan region ($38.61 in 2009–10).

d The load fees for $NO_x$ and VOCs include additional fees for the critical zone weighting for the Sydney Basin, plus fees for $NO_x$ (summer) and VOCs (summer) emissions.

e BaP emissions are based on NPI median PAH emissions of 12,000 kg multiplied by 0.0073 (the average BaP:PAH emission ratio for petroleum refining activities).

While the estimated increase in fees is significant, when the reported emissions from this type of activity are compared with other premises that already pay load fees under the LBL scheme, it appears a more equitable application of the polluter pays principle. This fee increase will provide licensees conducting this activity with a strong incentive to implement better strategies to reduce their emissions and consequently reduce their load fee.

There is a range of actions that licensees in this activity could undertake to reduce their projected LBL fee, such as introducing new pollution control equipment, fuel switching and modifying production practices. Actions may include negotiating an LRA (see section 7), whereby the licensee could forego paying a significant portion of pollutant load fees that would be due in exchange for implementing works within a four-year period that would reduce their assessable pollutant loads to agreed levels.

There will be additional costs placed on government in order to implement the proposed changes. DECC will incur administration costs associated with implementing the changes into the licensing information management system, and processing, verifying and auditing the additional information on assessable pollutants in the Annual Returns submitted by affected licensees.

The proposed amendment would ensure that there is a financial incentive for the premises to reduce emissions from carbon black production, which include fine particulates, $NO_x$, $SO_x$, VOCs and BaP. It will also apply LBL more equitably to industry as NPI data shows that premises conducting this activity emit LBL assessable pollutants in the same order of magnitude as many premises that are subject to LBL.

### Summary

Introducing the new fee-based activity, 'Carbon black production', including assessable pollutants into the new Regulation provides an incentive for premises conducting this activity to reduce their emissions of fine particulates, $NO_x$, $SO_x$, VOCs and BaP. As well as improvements to health and the environment due to reducing emissions, the change will make LBL a more economically equitable scheme by including all activities that emit significant loads of assessable pollutants.

DECC has carefully considered the submissions to the public exhibition process and has decided to incorporate carbon black production in the LBL scheme due to the significant air emissions generated. However in recognition of the economic pressures facing industry in Australia it has been decided to defer payment of LBL fees for a period of two years.

### 6.3.2 New LBL activity – 'Electricity generation from diesel'

Industries generating electrical power from diesel generally use similar equipment to industries generating electricity from gaseous or solid fuel (for example gas or coal). That is, gas turbines, reciprocating engines and boilers can easily fire either gaseous or liquid fuels.

Air emissions associated with electricity generation from diesel are typically particulates, $NO_x$, sulfur compounds, carbon dioxide, carbon monoxide, VOCs and PAHs. Heavy metals may be emitted if waste oils are used.

Air emissions can be controlled by using better quality fuel, selecting appropriately designed plant and a wide range of end-of-pipe pollution controls. Controls include low sulfur fuels, wet or dry low $NO_x$ burners, steam injection, $NO_x$ reduction using non-catalytic reduction or selective catalytic reduction, ammonia injection, oxidation catalysts, lean-burn technology and various plant control technologies.

Significant loads of assessable air pollutants can be discharged by the activity. The quantities are comparable to the pollutant loads emitted by other licensees that are already included in the LBL scheme.

The quantities of air emissions produced by electricity generation from diesel are broadly comparable with emissions from solid- and gas-fired electricity production, but this may vary according to the pollutant, the cycle of operation, the size and type of plant and the pollution control equipment fitted.

The key pollutants and estimated loads that may be emitted by generating electricity from diesel burning are summarised in Table 17. Comparison of the likely loads of each pollutant from this activity with the median LBL load reported for that pollutant indicates that the likely emissions are significantly higher than the median LBL load. This indicates that premises conducting this activity should be subject to LBL in order to address equity considerations with other forms of electricity generation.

**Table 17: Key pollutants and loads from 'Electricity generation from diesel'**

| Assessable pollutant | Estimated load (kg) | | Median LBL load (kg) | Median LBL load (kg) from electricity generation |
|---|---|---|---|---|
| | Bank of large reciprocating engines | Large gas turbine | | |
| BaP | 0.4 | 1 | 0.05 | 1.3 |
| $PM_{10}$ | 50,000 | 200,000 | 1,808 | 357,850 |
| $NO_x$ | 425,000 | 1,900,000 | 15,538 | 2,964,000 |
| $SO_x$ | 100,000 | 290,000 | 32,082 | 25,690,000 |
| VOCs | 38,000 | 115,000 | 3,086 | n/a |

DECC does not presently license any industries generating electrical power from diesel, but expects that several operations may apply for environment protection licences for this activity over the next five years. Under current arrangements, new premises constructed to generate electricity from burning diesel would not be required to pay LBL fees.

The amendment aimed to address the situation where LBL could provide an incentive for generation from diesel as opposed to solid fuels such as coal or gas where LBL fees apply.

### Options considered

Two options have been considered:

Option 1 – no change (base case)

Option 2 – add air assessable pollutants to the new fee-based activity 'Electricity generation from diesel'.

Under option 1, any premises that generates electricity from burning diesel would not be subject to LBL since only electricity generation from coal or gas has assessable pollutants. This option would mean that electricity generators that burn diesel would not be required to pay load fees even though they may emit quantities of air pollutants of the same magnitude as gas or coal generators who produce similar quantities of electricity and who are required to pay load fees. Clearly, this is not an equitable outcome. Further, this outcome may send a message to industry that electricity generation from diesel is preferable to generation from cleaner fuels such as gas. Such an outcome does not represent Government policy and would exacerbate air quality concerns in NSW. Therefore, option 1 was not the preferred option.

Option 2 proposed that any electricity generation plants that burn diesel would be required to pay load fees for specific assessable pollutants as is currently required for coal-fired or gas-fired generation. This option leads to a fairer outcome whereby all generators are required to pay load fees for emissions of pollutants which provides an equivalent incentive for reducing their emissions.

Table 18 lists the proposed assessable air pollutants and FRT factors for electricity generation from diesel. The proposed FRT factors are equal to the equivalent FRT factors for coal-fired electricity generation.

**Table 18: Proposed air assessable pollutants and fee rate threshold factors**

| Assessable pollutant | FRT factor |
|---|---|
| Benzo[a]pyrene | 0.0036 |
| Fine particulates | 54 |
| $NO_x$ | 2,700 |
| $SO_x$ | 2,650 |
| VOCs | 76 |

### Costs and benefits of the amendment

Previously, there were no premises that are licensed for electricity generation from diesel. Therefore, there were no immediate costs to industry from this amendment. However, if new premises are constructed that undertake this activity, costs will

include licence fees and monitoring and reporting costs to meet the proposed LBL requirements.

An accurate assessment of costs cannot be made, but it can be assumed that the fees for this activity will be similar to fees for existing activities generating electricity from solid or gaseous fuels. This is because emissions per unit of activity and proposed FRTs are broadly similar to activities generating electricity from solid or gaseous fuels.

Future licensees would be required to conduct monitoring and reporting to meet likely licensing and NPI requirements. This monitoring will generally meet LBL requirements, and DECC does not expect that any monitoring purely for LBL purposes would be required. In some cases, relatively minor modifications to standard monitoring regimes may be required.

DECC will incur additional administrative costs in processing and verifying the LBL data submitted in the Annual Return by the affected licensee. These tasks will require minimal additional resources since it is not expected that there will be a significant number of new premises conducting this activity.

The major benefit of the amendment is that it would ensure that there is an equivalent financial incentive for any new activity generating electrical power from diesel to reduce its emissions in line with other electricity generators that operate on coal or gas. This will potentially reduce external environmental and health costs associated with emissions from this activity.

The amendment will also provide industry and DECC with an indication of how the activity performs. The information collected on assessable pollutants from this industry will assist in the development of programs to improve industry performance levels or to inform wider DECC policy and program development at the local or regional level.

**Summary**

Expanding the LBL requirements on electricity generation to include the new fee-based activity ‘Electricity generation from diesel’ by introducing new assessable pollutants in the Regulation for this activity provides incentives to reduce emissions that may cause serious environmental harm. It also ensures an equitable application of the polluter pays principle across activities that generate electricity and emit a similar load of these assessable pollutants.

### 6.3.3 Further discussion – adding new assessable pollutants for fee-based activities that currently do not have assessable pollutants

As part of the review of the Regulation, DECC considered adding assessable pollutants to a number of other scheduled activities, such as aquaculture, mining, agricultural produce and intensive livestock industries. The analysis indicated that either the methodologies for measuring or estimating emissions were unreliable, or inclusion of these activities in LBL would place a cost burden on the licensees greater than any commensurate benefit for the environment. DECC will continue to review the suitability and applicability of adding assessable pollutants to scheduled activities that do not currently have assessable pollutants in the future.

## 6.4 Adding a threshold to 'Petroleum and fuel production' below which assessable pollutants do not apply

The fee-based activity 'Petroleum and fuel production' includes premises that have a capacity to produce more than 100 tonnes of petroleum per year.[25] Annual production levels for petroleum facilities in NSW appear to fit into three distinct production categories:

- greater than 3,000,000 tonnes
- approximately 30,000 tonnes
- less than 10,000 tonnes.

Large petroleum operations involve the cracking and distillation of crude oil into its different fractions which are further processed. The main environmental impacts at these premises relate to:

- air pollutants such as VOCs, $SO_x$, $NO_x$ and hydrogen sulfide, which are released from the various chemical processes
- pollutants in water emissions from the process water used in refining and as cooling water
- solid waste generated from the process sludges and spent catalysts.

By comparison, the smaller petroleum operations that are included in this scheduled category mainly undertake blending of gasoline or fuel with other chemicals. The main emissions are VOCs.

Table 19 compares the loads of assessable pollutants emitted by small petroleum producers (i.e. premises that produce less than 10,000 tonnes of petroleum per year) with all petroleum producers and with total loads of the pollutants emitted by all LBL licensees. The data shows that the magnitude of loads emitted from small petroleum producers is insignificant compared with total loads from all petroleum producers (i.e. less than 0.2%). For example, large petroleum producers emit a total of 2.4 tonnes of benzene annually whereas small petroleum producers typically emit a total of seven kilograms of benzene per year (0.3%).

[25] The definition of petroleum includes aviation fuel, petrol, kerosene, mineral turpentine, fuel oils, lubricants, wax, bitumen, liquefied gas and the precursors to petrochemicals, such as acetylene, ethylene, toluene and xylene.

**Table 19: Comparison of selected assessable pollutant loads from petroleum producers with all LBL premises**

| Assessable pollutant | Total load (tonnes) | | |
|---|---|---|---|
| | LBL premises | Petroleum producers | Petroleum producers <10,000 tonnes |
| No. of premises | 282 | 12 | 5 |
| Benzene | 360 | 2.4 | 0.007 |
| BaP | 0.23 | 0.012 | 0.00005 |
| Fine particulates | 7,400 | 290 | 0.007 |
| Hydrogen sulfide | 110 | 9 | 0.005 |
| $NO_x$ | 160,000 | 2,600 | 4.5 |
| $SO_x$ | 290,000 | 4,800 | 0.4 |
| VOCs | 4,900 | 2,300 | 3 |
| Biological oxygen demand (BOD) | 65,000 | 25 | 0.001 |
| Oil and grease | 11,000 | 19 | 0.003 |
| Total suspended solids | 64,000 | 49 | 0.002 |
| Total PAHs | 0.11 | 0.042 | 0.000008 |
| Total phenolics | 0.98 | 0.98 | 0 |

Based on 2004–2005 LBL data.

Further analysis of the LBL data from petroleum production premises that produce less than 10,000 tonnes of petroleum indicates that the total assessable pollutant fee is significantly less than the administrative fee, which means that none of the premises is paying an LBL fee. It appears unlikely that these premises would pay an LBL fee unless production levels significantly increased 10-fold or more.

LBL is intended to provide an incentive for industry to reduce emissions. However, this analysis has shown that LBL is not providing any economic incentive for small petroleum producers to improve their environmental performance. Therefore, the aim of this amendment was to change the way that LBL is applied to small petroleum producers to improve their efficiency.

### Options considered

Two options were assessed for improving the incentive provided by LBL for premises with 10,000 tonnes production capacity for petroleum production:

Option 1 – no change (base case)

Option 2 – add a production capacity threshold to petroleum production, below which the current assessable pollutants do not apply.

Under option 1, all ‘Petroleum and fuel production’ activities licensed by DECC would continue to be required to report on the current assessable pollutants for this fee-based activity. As noted for the small petroleum producers, LBL provides no incentive since the premises are only paying administrative fees and are unlikely to ever emit pollutant loads that will require them to pay LBL fees. Therefore, this option did not address the problem.

For option 2, a threshold would be set below which assessable pollutants are not applicable. The threshold is set at a nominal level to represent a judgement of low

risk. This proposal is consistent with other fee-based activities such as 'Electricity generation from coal' where a threshold defines the activity level above which assessable pollutants apply.

Under this proposal it was considered that a threshold of 10,000 tonnes per year would be appropriate given the information in Table 21. There are five premises licensed for petroleum production with production less than 10,000 tonnes per year of petroleum. These premises all pay an administrative fee of $2,500 each and pay no LBL fee because of the low pollutant loads. In 2004–2005, the load-based fee component for these licensees averaged $310, well below the administrative fee.

A higher threshold, such as 30,000 tonnes, was considered but not recommended since some of the premises that produce between 10,000 and 30,0000 tonnes per annum pay LBL fees, meaning that LBL currently provides an incentive to reduce their emissions.

The preferred option was option 2, which will introduce a threshold of 10,000 tonnes per year production of petroleum below which the current assessable pollutants do not apply. This option will reduce the administrative burden of LBL reporting on premises that do not pay LBL fees and are unlikely to in the future. The change will focus LBL so that it affects licences where it will provide an incentive to improve environmental performance.

### Costs and benefits of the amendment

The amendment means that those premises under the 10,000 tonnes per year threshold would no longer report loads of assessable pollutants. This would reduce the administrative burden and associated reporting costs (including any monitoring costs that are completed solely for LBL purposes) on the affected premises that are currently required to report on emissions of 12 assessable pollutants. The total resource savings from no longer reporting this information in the Annual Return are not readily quantifiable. However, it is estimated that the saving to industry of not conducting the administrative tasks associated with reporting LBL data in the Annual Return is approximately $1,625 per annum[26] with additional savings possible as a result of reduced monitoring costs. It should be noted that no change to licence fee revenue from these premises is expected since they will continue to pay administrative fees.

The amendment will also reduce administration requirements for DECC. DECC will not send LBL worksheets for completion to licensees as part of their licence anniversary process or conduct a compliance check of the completed worksheets. This is expected to release DECC resources to focus on higher risk premises, where more significant environmental benefits can be achieved. The cost to DECC is estimated at $330 per year.[27]

The amendment also results in DECC no longer receiving this emissions data since it is unlikely that it would be reported to the NPI. However, as shown in Table 19, the emissions are minor and at current production levels the premises appear to be unlikely to emit significant loads of pollutants. Hence, the loss of this emissions data

[26] This estimate is based on the cost to each licensee of five hours staff time per year, valued at $65 per hour.

[27] This estimate is based on the cost to government of six hours of staff time per year, valued at $55 per hour. DECC estimates that the LBL component of the licence anniversary notice for this industry currently requires 1.5 hours per licence per annum.

was not considered significant given the benefits to both the licensee and government in terms of reduced administrative costs.

**Summary**

The amendment introduces a threshold of 10,000 tonnes per year for petroleum production below which the current assessable pollutants do not apply. The objective of this amendment is to ensure that requirements on LBL premises to monitor and pay pollutant fees apply to assessable pollutants where there are sufficient benefits to justify such requirements.

The analysis shows that the amendment will reduce the administrative burden placed by LBL on both the licensees affected and the Government, with no likely adverse impacts on the environment due to the very low emissions from the premises affected by the change. While the impact of air emissions on air quality in NSW is important, the level of emissions from the affected premises is minor compared to air emissions from the larger petroleum producers. Therefore, it is not efficient administratively to include small operators in the LBL scheme since they do not pay LBL fees because their emissions are small. In any case, LBL is not providing an incentive to these operators to reduce their emissions and is not the most effective tool to manage low emission levels.

DECC can still regulate emissions from poorly performing premises through conditions placed on their operating licences. The amendment allows DECC resources to focus on the aspects of petroleum production that have significant environmental impacts and reduce the burden of licensing for those premises where LBL is not providing an incentive.

## 6.5 Amending current or adding new fee rate threshold factors

Schedule 1 of the Regulation includes an FRT factor for each assessable pollutant for which each fee-based activity is required to pay a pollutant load fee. The FRT factor is used to calculate the applicable pollutant fee (a component of the annual licensing fee for LBL premises) using the formula set out in Appendix 1 and illustrated in Figure 1.

The FRT is an emission threshold for each industry type and pollutant which is set at a level that can be reasonably achieved with modern technology. The threshold should only be exceeded if an operator is not using modern technology, or if its management and control systems are poor. Doubling the load fee beyond this threshold provides a strong incentive for industry to reduce high levels of pollution promptly.

FRT factors were included in LBL to provide an added incentive to poorly performing LBL licensees to reduce their emissions as load fees effectively double for emissions above the FRT. For example, coke production has an FRT factor of 0.45 kg of $PM_{10}$ per tonne of coke produced. Hence, load fees for $PM_{10}$ emissions from coke production are:

- $459 per tonne for less than 0.45 kg of $PM_{10}$ per tonne of coke produced
- $919 per tonne for more than 0.45 kg of $PM_{10}$ per tonne of coke produced.

Existing FRT factors were developed based on performance information (mostly from the United States) and, where available, represent industry-specific Reasonably

Available Control Technology standards. As such, FRT factors were initially designed to represent the environmental performance that each industry should be able to achieve using Reasonably Available Control Technology.

DECC has collected five years of pollutant load data and annual production rates from all LBL premises. This data was used to generate the rate of emissions per unit of production for each LBL premises and for each fee-based activity, which in turn was used to determine if the FRT factors were providing added incentive to LBL premises to reduce emissions.

The review indicated that in about two-thirds of cases, FRT factors were not providing any added incentive for LBL premises to improve their performance. In many cases, the existing FRT factors were at least an order of magnitude greater than the average emissions per unit production that the industry was currently achieving. For example, the FRT factor for fine particulates for licensees conducting the activity 'Paint/polishes/adhesives production' is currently 5 kg per tonne per year while average emissions per unit production for the vast majority of paint/polishes/ adhesives production licensees (11 licensees) is 0.0356 kg per tonne per year, and the worst performing premises are emitting at 0.2 kg per tonne per year.

The objective of this amendment was to ensure FRT factors establish an adequate level of environmental performance and provide added incentive to poorly performing licensees to improve their environmental performance.

### 6.5.1 Options considered

Three options for amending or adding new FRT factors were considered:

Option 1 – no change (base case)

Option 2 – set FRT factors according to industry best practice/best available technology standards

Option 3 – amend FRT factors where relevant to reflect average industry emission levels currently achieved in NSW where the FRT factor is providing no additional incentive for industry to reduce emissions.

Under option 1, there would be no change to the current FRT factors. This option did not address the requirement to amend FRT factors that clearly do not give industry a reasonable incentive to improve environmental performance.

For example, Table 20 shows the percentage of the 15 licences in the fee-based activity 'Ceramics production (excluding glass)' that are performing below the existing assessable pollutant FRT factor. For these licensees the existing FRT factor provided little or no added economic incentive to reduce pollutant emissions.

**Table 20: Current and new impact of FRT factors for ceramics production**

| Assessable pollutant | Current FRT factor | Premises below FRT (%) | Proposed FRT factor | Projected premises below FRT (%) |
|---|---|---|---|---|
| Coarse particulates | 0.18 | 93% | 0.085 | 60% |
| Fine particulates | 1.58 | 100% | 0.11 | 73% |
| Fluorides | 0.8 | 100% | 0.12 | 80% |
| $NO_x$ | 10.5 | 100% | 0.22 | 60% |
| $SO_x$ | 18.2 | 100% | 0.53 | 60% |

Based on 2004–05 LBL data.

Option 2 would likely address the proposed requirement of setting FRT factors that are relevant to the industry sector and provide an incentive for improved production. This option would establish FRT factors on best practice/best available technology standards sourced from best practice studies in Australia and/or performance standards overseas. However, the disadvantages of this option were that comprehensive data to develop such an approach is not readily available, nor is overseas data necessarily applicable to Australian production practices. This is evident since the current FRT factors were based on such studies and have been found not to be relevant for industry practices in NSW.

Option 3 proposed to amend FRT factors where they were providing no additional incentive for industry to reduce their emissions to reflect average industry emission levels currently achieved in NSW. Where the review of emissions of assessable pollutants per unit production found a large disparity between current industry performance and the FRT factor exists, DECC proposed to decrease the FRT factor. This would provide added incentive to LBL licensees to reduce their emissions and better reflect actual reasonably achievable control technology in NSW.

The amendment changes or adds new FRT factors for 15 out of the 28 LBL activities, for one or more assessable pollutants in the LBL scheme as detailed in Table 21. A number of FRT factors will remain unchanged because:

- there is currently insufficient data to justify a change, or
- the existing FRT factor already provides incentive for licensees to improve their performance and does not need to be changed.

A number of new FRT factors were also proposed – refer to section 6.1 for further information. In this case DECC used average emissions per unit production using 2002–2005 NPI data or emissions standards from overseas literature. DECC intends to review these factors at a later date.

The preferred option was option 3 because option 1 would clearly not address the problem and option 2 could not be implemented fully due to the lack of current comprehensive information. The changes to FRT factors proposed by option 3 were based on the average performance that each industry (in NSW) had actually achieved over the last five years rather than a theoretical assessment of what the industry should be able to achieve based on international emission standards. Option 3 will best ensure that the FRT factors are set at a level that is relevant to NSW production practices and where they may provide an incentive for some premises to improve performance.

**Table 21: Proposed changes to existing and new FRT factors**

| Fee-based activity | Pollutant | Current FRT factor | Proposed FRT factor |
|---|---|---|---|
| Aluminium production (alumina) | Coarse particulates | 5 | 0.75 |
| | Fine particulates | 12 | 0.96 |
| | Fluorides | 1 | 0.75 |
| | Lead (air) | — | 0.00011 |
| Aluminium production (scrap metal) | Fluorides | 1 | 0.056 |
| | $NO_x$ | 4 | 0.74 |
| | $SO_x$ | 9.6 | 0.46 |
| Carbon black production | Benzo[a]pyrene | — | 0.005 |
| | Fine particulates | — | 0.3 |
| | $NO_x$ | — | 11 |
| | $SO_x$ | — | 8 |
| | VOCs | — | 0.4 |
| Cement or lime production | Coarse particulates | 0.23 | 0.1 |
| | Fine particulates | 0.37 | 0.28 |
| | Lead (air) | — | 0.00061 |
| | Mercury (air) | — | 0.00054 |
| Ceramics production | Coarse particulates | 0.18 | 0.085 |
| | Fine particulates | 1.58 | 0.11 |
| | Fluorides | 0.8 | 0.12 |
| | $NO_x$ | 10.5 | 0.22 |
| | $SO_x$ | 18.2 | 0.53 |
| Coke production | Benzene | 0.072 | 0.028 |
| | Benzo[a]pyrene | 0.00073 | 0.00003 |
| | Coarse particulates | 0.45 | 0.22 |
| | Fine particulates | 0.45 | 0.3 |
| | VOCs | 0.83 | 0.015 |
| | Arsenic (air) | — | 0.00085 |
| | Lead (air) | — | 0.0021 |
| | Mercury (air) | — | 0.0022 |
| Electricity generation from coal | Benzo[a]pyrene | 0.0036 | 0.00066 |
| | Selenium | 0.14 | 0.025 |
| | Arsenic (air) | — | 0.0037 |
| | Lead (air) | — | 0.019 |
| | Mercury (air) | — | 0.0042 |
| Electricity generation from gas | $NO_x$ | 2,700 | 1,655 |
| | Salt | 3.6 | 0.0029 |
| | Total suspended solids | 0.18 | 0.066 |
| Electricity generation from diesel | Benzo[a]pyrene | — | 0.0036 |
| | Fine particulates | — | 54 |
| | $NO_x$ | — | 2,700 |
| | $SO_x$ | — | 2,650 |
| | VOCs | — | 76 |

| Fee-based activity | Pollutant | Current FRT factor | Proposed FRT factor |
|---|---|---|---|
| Glass production – container glass | Arsenic (air) | — | 0.00028 |
| | Lead (air) | — | 0.0018 |
| Iron and steel production (iron ore) | Arsenic (air) | — | 0.000014 |
| | Lead (air) | — | 0.0014 |
| | Mercury (air) | — | 0.000041 |
| Iron and steel production (scrap metal) | Fine particulates | 0.77 | 0.33 |
| | $NO_x$ | 1.95 | 0.12 |
| | $SO_x$ | 3.38 | 0.5 |
| | Arsenic (air) | — | 0.000057 |
| | Lead (air) | — | 0.00024 |
| | Mercury (air) | — | 0.00013 |
| Non-ferrous metal production (scrap metal) | $NO_x$ | 0.57 | 0.37 |
| | VOCs | 2.28 | 0.11 |
| Paper or pulp production | BOD | 5.55 | 0.41 |
| | Coarse particulates | 0.39 | 0.026 |
| | Fine particulates | 1.49 | 0.075 |
| | $NO_x$ | 3.51 | 1.53 |
| | Total suspended solids | 8.35 | 0.57 |
| | Total nitrogen | 0.1 | 0.078 |
| | Zinc | 0.13 | 0.0013 |
| Paints/polishes/adhesives production | Benzene | 0.27 | 0.015 |
| | Fine particulates | 5 | 0.035 |
| | $NO_x$ | 3 | 0.068 |
| | VOCs | 8.73 | 2.1 |
| Petroleum and fuel production | Benzene | 0.004 | 0.00044 |
| | Benzo[a]pyrene | 0.005 | 0.000002 |
| | BOD | 0.14 | 0.0034 |
| | Fine particulates | 0.2 | 0.039 |
| | Hydrogen sulfide | 0.031 | 0.002 |
| | $NO_x$ | 0.5 | 0.33 |
| | Oil and grease | 0.12 | 0.0015 |
| | $SO_x$ | 0.6 | 0.44 |
| | Total PAHs | 0.07 | 0.000005 |
| | Total phenolics | 0.27 | 0.00011 |
| | Total suspended solids | 0.36 | 0.0052 |
| | Arsenic (air) | — | 0.000011 |
| | Lead (air) | — | 0.000059 |
| | Mercury (air) | — | 0.000011 |
| Plastics resins production | Benzene | 0.5 | 0.00073 |
| | Fine particulates | 5 | 0.041 |
| | $NO_x$ | 3 | 0.092 |
| Plastics reprocessing | Benzene | 0.5 | 0.00073 |
| | Fine particulates | 5 | 0.041 |
| | $NO_x$ | 3 | 0.092 |

### 6.5.2 Costs and benefits of the amendment

The amendment to current FRT factors will not affect all licensees conducting the fee-based activities where FRT factors are proposed to be decreased. For those industries conducting these activities that are emitting pollutants at or above current NSW industry average, the change will have no impact since the FRT will not impact on their pollutant fee calculations unless their operating performance declines. However, for those premises that emit pollutants at a level below current NSW industry average, the change may affect the pollutant fee calculation and therefore provide an incentive to improve performance.

For the latter group of licensees, the amendment is not expected to increase monitoring or reporting, but it will result in increased pollutant fees if they do not improve their performance. Based on 2004–2005 LBL data, the changes in FRT factors would result in an estimated increase in total LBL fees for industry of approximately $0.5 million per annum. This is an increase of about 2% in total fees payable by LBL licensees. The calculated fee increase does not take into account the further fee increases expected from the addition of lead, arsenic, mercury and BaP as assessable air pollutants to some LBL activities.

Table 22 sets out the licence fee impacts for each fee-based activity with proposed changes to their FRT factors. Six fee-based activities account for 97% of the projected revenue increase:

- coke production – 54%
- aluminium production (alumina) – 16%
- ceramics production – 8%
- paints/polishes/adhesives production – 7%
- petroleum and fuel production – 6%
- electricity generation from gas – 6%.

This fee increase will provide the affected licensees with incentive to implement better strategies to reduce emissions to the environment and consequently reduce the LBL fee. The fee increase may also encourage licensees to negotiate an LRA as discussed in section 7.

The changes to current FRT factors will have no impact on DECC administrative practices since there is no new information rising from the changes. For the new FRT factors (e.g. for carbon black production and the new assessable pollutants arsenic, lead, mercury and BaP), there will be an increase in the administrative workload for DECC, but this is not considered significant and can be incorporated into current workloads.

The benefits of the amendment are that:

- it provides greater incentive for those premises that perform worse than the industry average to improve their performance while rewarding industry that is performing at or above current NSW industry averages
- it will likely lead to reductions in pollutant emissions where licensees take actions to improve their performance so that their LBL fees are not affected by the FRT
- changing FRT factors to reflect the average actual industry performance sends a meaningful message to industry and the public on what an acceptable level of performance is within industry.

**Table 22: Projected load fee increase for loads emitted from each fee-based activity due to FRT factor changes**

| Fee-based activity | Baseline total load fees[a] | Projected load fee increase due to FRT factor | Projected increase due to FRT factor |
|---|---|---|---|
| Aluminium production (alumina) | $474,607 | $88,592 | 19% |
| Aluminium production (scrap metal) | $78,474 | $3,487 | 3.2% |
| Cement or lime production | $420,320 | $2,393 | 0.6% |
| Ceramics production | $269,082 | $41,019 | 15% |
| Coke production | $2,441,900 | $292,059 | 12% |
| Electricity generation from coal | $14,331,369 | $234 | 0% |
| Electricity generation from gas | $181,622 | $33,215 | 18% |
| Iron and steel production (scrap metal) | $122,562 | $2,929 | 2.4% |
| Non-ferrous metal prod (scrap metal) | $41,899 | $1,944 | 4.6% |
| Paper or pulp production | $30,724 | $2,219 | 7% |
| Paints/polishes/adhesives production | $60,010 | $36,340 | 61% |
| Petroleum and fuel production | $1,886,600 | $33,548 | 1.7% |
| Plastic resins production | $150,334 | $1,237 | 0.8% |
| **Total** | **$21,055,832** | **$539,218** | |

[a] Estimated load fees for the 2007–08 period. Note that the sum of the individual assessable pollutant load fees for each fee-based activity is used. That is, a single site may pay fees for emissions of an assessable pollutant from multiple fee-based activities. This results in variation between the data in this table and Appendix 3 where premises' LBL fees are all assigned to a single fee-based activity.

### 6.5.3 Summary

Changing the FRT factors to reflect the average actual industry performance sends a meaningful message to industry and the public on what an acceptable level of performance is within the industry. The amended FRT factors outlined in Table 20 are expected to provide for additional incentive for LBL licensees to improve their environmental performance as measured by average industry standards where they are currently performing below the industry average.

## 6.6 Reporting actual quantity of activity for summer assessable pollutants

The POEO (Licensing Fees) Regulation 2007 commenced on 30 June 2007 with a requirement for specific premises operating in the Sydney Basin area to pay higher fees for emissions of $NO_x$ and VOCs over summer (December, January and February) when air quality problems are worse.

Due to an oversight in the drafting of that Regulation, no requirement was included for affected premises to report their actual quantity of activity for the summer period — actual quantity of activity relates to either production for a manufacturing plant or throughput for a chemical storage facility. This means that when calculating the FRT for the assessable pollutants $NO_x$(summer) and VOCs(summer), an FRT for a 12 month period is calculated instead of a FRT for a 3 month period (summer). Effectively this means that the FRT for the assessable pollutants $NO_x$(summer) and VOCs(summer) has no impact on the calculation of load fees. That is, the FRT is not

providing an incentive to reduce emissions of $NO_x$(summer) and VOCs(summer) in the way it was intended to.

The aim of this proposal was to amend the Regulation so that the assessable pollutants, $NO_x$(summer) and VOCs(summer), were potentially subject to the incentive provided by the FRT factor as are emissions of all other assessable pollutants.

### 6.6.1 Options considered

Two options for reporting the actual quantity of activity over summer were considered:

Option 1 – no change (base case)

Option 2 – require premises which report emissions of $NO_x$(summer) and/or VOCs(summer) to report actual quantity of activity for the summer period.

Under option 1, there would be no change to the current situation where the FRT does not play any part in determining the load fees for the summer pollutants because the FRT is calculated based on a 12 month period while the emissions are only for a 3 month period – i.e. only an extremely poorly performing plant would be affected by the current situation. This option did not place any incentive for the licensee to consider and improve its environmental performance for the summer period when air quality problems are worse.

Option 2 proposed that any licensee required to pay load fees for emissions of $NO_x$(summer) or VOCs(summer) would have to report actual quantity of activity for the summer period, and this information would be used to determine an FRT for the emission. This option leads to a more equitable outcome whereby the FRT for $NO_x$(summer) and VOCs(summer) is calculated analogously to that of all the other assessable pollutants; consequently the FRT might provide added incentive for some licensees to reduce their emissions.

### 6.6.2 Costs and benefits of the amendment

There are about 60 licensees that are required to report and pay load fees for $NO_x$(summer) or VOCs(summer) that would potentially be affected by this change. It was not possible to determine the financial impact of the amendment on these licensees because DECC has not received a complete dataset for the summer pollutants and cannot project accurate seasonal production/throughput and pollutant load data for the summer period from annual LBL data.

The change requiring the reporting of actual quantity of activity (summer) will have a minor impact on DECC administrative practices since a new information data field will be reported from about 60 premises. This will result in some one-off changes being required to the information management system to accept the data, plus there will be a minor increase in the annual administrative workload for DECC. These changes are not considered significant and can be integrated into current workloads.

The benefits of the amendment are:

- that the FRT is applied consistently and equitably to the calculation of all LBL pollutant load fees

- potential reductions in emissions of $NO_x$ and VOCs during the summer where licensees improve their performance so that their $NO_x$(summer) and VOCs(summer) fees are not affected by the FRT.

### 6.6.3 Summary

Requiring premises that must pay load fees for $NO_x$(summer) or VOCs(summer) to report actual quantity of activity (summer) corrects inequity between the current methods for calculating FRTs. The amendment provides additional incentive during summer when air quality is poor for LBL licensees to improve their environmental performance.

# 7 Load reduction agreements

Under the Regulation, there are provisions that allow licensees to enter into LRAs with DECC. LRAs provide immediate fee reductions for companies which are willing to commit to future reductions of assessable pollutant loads, thereby freeing funds for investment in abatement strategies or technology that reduce levels of pollutants emitted. This increases investment in pollution reduction technology, resulting in improved air and water quality and potentially promoting the development of new, more sustainable business practices and attitudes by industry.

LRAs last for a maximum of four years, giving licensees up to three years to implement upgrades and the final year of the agreement to demonstrate attainment of the agreed load reduction. At the end of a successful LRA period, the agreed load reduction becomes the basis for negotiating the new load limit on the environment protection licence.

## 7.1. Fee repayment methodology

LRAs were developed as a measure to encourage licensees to divert funds that would otherwise go to LBL fees into the implementation of pollution reduction. Figure 2 shows the method of calculating fee savings where a licensee achieves the agreed load reduction.

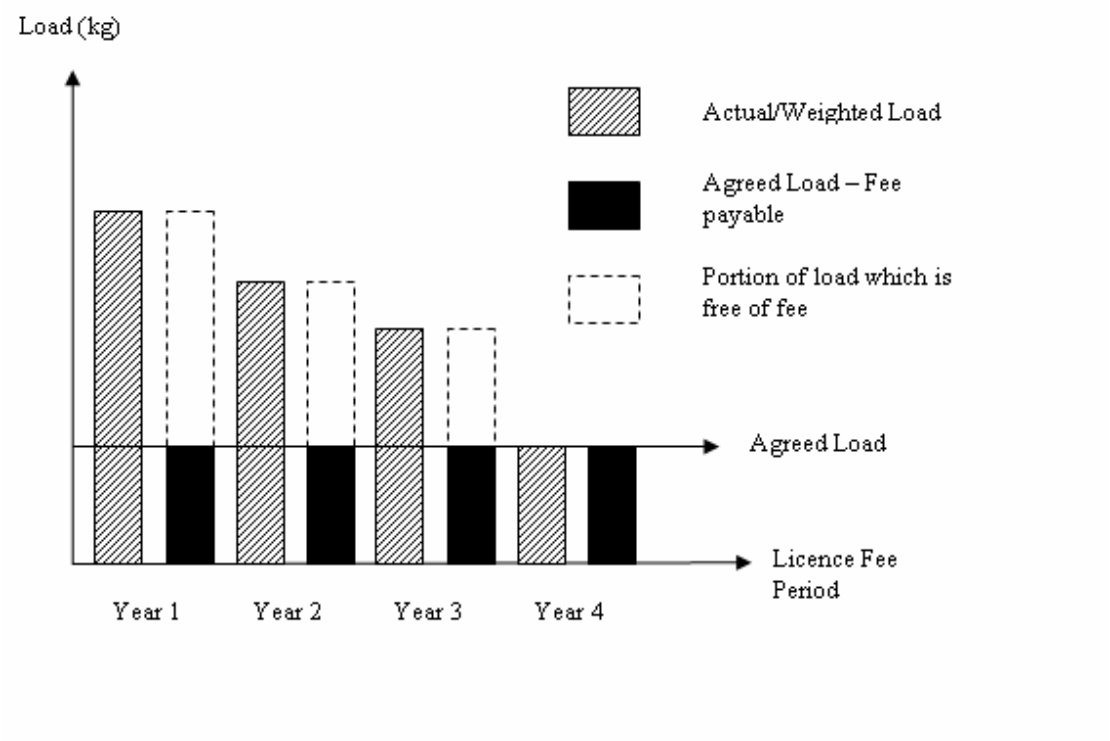


**Figure 2 Fee savings achieved by an LRA**

If a licensee fails to achieve the agreed load by the expiration of the LRA period, they are required to repay fee savings gained over the period of the LRA in accordance with clause 28B of the Regulation.

A licensee may choose to terminate the LRA if they become aware that they are unable to achieve the agreed load by the nominated time frame, in which case they are required to repay the fee savings gained over the time they held the LRA.

Fee repayments following the expiration or termination of an LRA are calculated using a 'maximum load', which is taken to be the lowest reported load over the agreement period minus one per cent. Fee repayments are calculated based on the difference between the fee that would have been payable if the load had been equal to the agreed load under the agreement and the fee that would have been payable if the load had been equal to the maximum load.

This calculation method is based on the principle that if the licensee achieves a partial reduction in load then they retain some financial benefit under the LRA. Experience has shown that while the principle is supported in some cases, the calculation methodology outlined in clause 28B of the previous Regulation was overly complex and difficult to implement.

There have also been instances where a low assessable load has been reported during the period of the LRA, but ongoing load reductions have not been achieved. In these instances, the fee repayments were based on the single low load reported.

Consequently, it was proposed that this clause would be amended to ensure that the repayment calculation methodology is made clearer and more transparent and the principle of allowing licensees to gain the benefit of any permanent reduction of load is maintained.

### 7.1.1 Options considered

Two options for clarifying fee repayment methodology for LRAs were considered.

Option 1 — no change (base case)

Option 2 — amend the repayment methodology whereby licensees that fail to achieve agreed loads repay all fee savings gained under the LRA (being the difference between the agreed and actual or weighted loads).

Under option 1 there would be no change to the fee repayment methodology which was overly complex and difficult to implement. This option did not improve the clarity of the requirement.

Option 2 was the preferred option as it clarified that licensees who fail to achieve their agreed loads upon expiration or termination of their LRA repay all their fee savings to DECC (being the difference between the agreed and actual loads). It also eliminates ambiguity and confusion with respect to the fee repayment calculation and ensures that the fee repayment methodology encourages licensees to enter into LRAs where agreed loads are both economically viable and achievable.

Figure 3 shows the proposed method of calculating fee repayments where a licensee does not achieve the agreed load reduction.

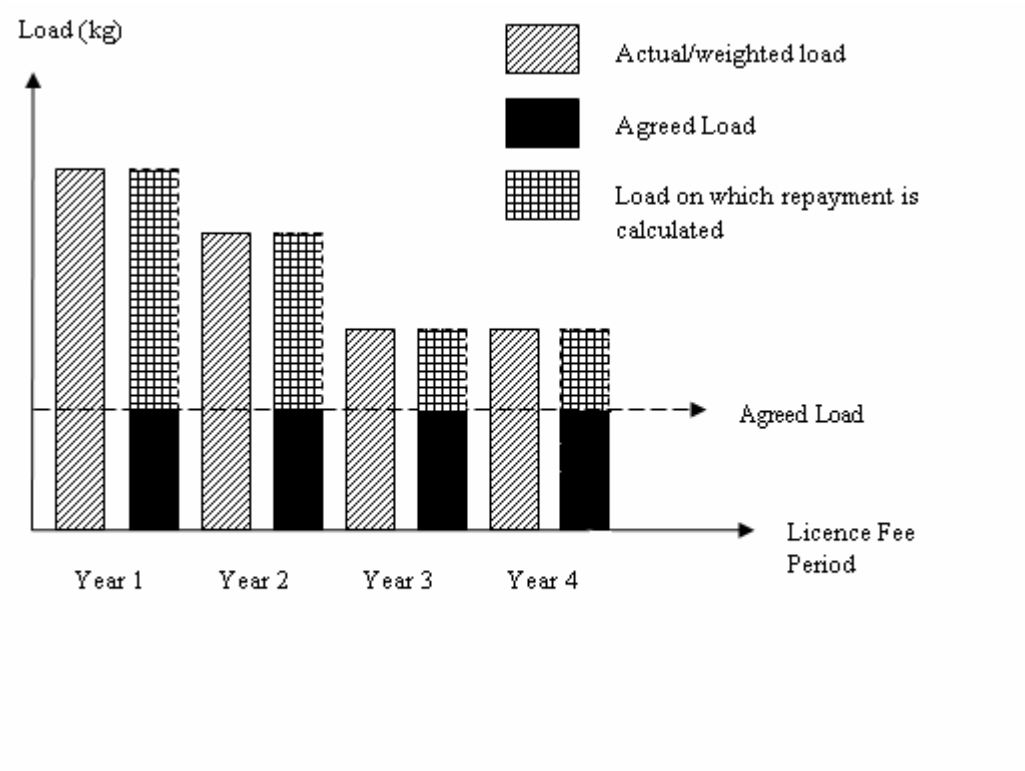


**Figure 3 Repayments due when an LRA is not met**

### 7.1.2 Costs and benefits of the amendment

For those licensees who successfully undertake the proposed works and achieve the agreed loads by the end of the LRA period, there would be no financial impact resulting from the proposed amendment. For those licensees who fail to achieve their agreed load, the amendment will require them to repay the difference between the actual load they achieve and the load agreed to under the LRA. The exact economic and financial impact of the amendment on fee repayments was hard to estimate as it largely depends on the premises and the loads achieved.

There will be no impact on the hours of work for industry. There would be no additional administrative workload imposed on licensees as a result of the amendment.

This methodology is simple and easy to understand, ensuring that on termination or expiry all licensees that have not achieved their agreed loads will repay any fee savings gained under the LRA.

To date a total of 30 LRAs have been entered into and completed. Of these only seven were successful, and six partially successful. The remainder of licensees did not achieve the agreed load. Licensees should set realistic targets and not enter into an LRA without ensuring that they have capacity to achieve the terms of the agreement. Licensees also need to set realistic contingencies and monitor their progress against their indicator milestones.

The new approach provides a clear and transparent methodology for determining fee repayments. There will be a reduction in hours of work for DECC officers, as less time will be spent on calculating and verifying the appropriate fee repayment calculations. The savings have been estimated at five hours per LRA.

In addition, the amendment is consistent with the LBL scheme's aim to provide an incentive to licensees to invest in pollution abatement to reduce their pollutant load fees.

Under LBL, licensees that partially reduce their loads already receive a fee saving by reducing their actual load. Where the agreed loads are not achieved, the requirement for licensees to repay all the fee savings gained during the LRA period ensures the continued integrity of the LBL scheme, in which fee savings act as an incentive to reduce the discharges into the environment.

While it is not possible to quantify the degree to which the LRA provides an incentive (additional to LBL), successful completion of LRAs to date indicates the significant potential of both savings to industry and load reductions available through an LRA. For example, a local council entered into an LRA in 2001 to reduce its total phosphorus load from a sewage treatment plant. At the end of the four year agreement it had reduced its total phosphorus load by 70%, well within the agreed load. At the end of the agreement the council reduced its LBL fees by 48%, saving approximately $36,000 over the term of the agreement.[28]

### 7.1.3 Summary

LRAs provide financial assistance to licensees by allowing them to allocate a portion of their funds that would otherwise have to be spent on pollutant load fees, to invest upfront in pollution abatement measures to reduce their pollutant load. The amendment to the LRA repayment methodology improves the effectiveness of the fee-based incentive offered by LRAs by ensuring that the LBL fee payable is consistent with the actual pollutant load emitted by the end of the reporting period.

## 7.2 Load reduction agreement reporting requirements

To date a total of 30 LRAs have been entered into by licensees.[29] Ten of these were terminated before completion. In some of these cases, licensees were aware of problems early on; however, DECC was not informed and the licensee did not choose to terminate the agreement until close to the end of the LRA term. This has led to delays in finalising the repayments and significant administrative load on DECC that could have been alleviated through early notification of the likely need to terminate the LRA.

A review of the current LRA framework indicates that modifications are required to identify early both potential and actual problems with individual LRAs. The amendment was that licensees who enter into LRAs be required to report on the progress of the works committed to on an annual basis. This will ensure that DECC is aware of the status of any ongoing works required for completion of the LRA and will identify where there is high risk of LRA failure.

### 7.2.1 Options considered

Two options were considered for improving the risk management procedures surrounding LRA completion.

Option 1 – no change (base case)

[28] DECC LBL annual return data 2001–05.
[29] Seven LRAs were successful, six were partially successful and 17 were not successful.

Option 2 – include an annual reporting requirement for LRAs.

Under option 1, there would be no change to the reporting requirements for LRAs. This would continue the current situation where licensees are not required to notify DECC of any potential problems in meeting the terms of the LRA.

Option 2 would require the licensee to submit annual reports during the term of the LRA reporting on the progress of the agreed works. The report would alert DECC officers to any issues or delays associated with the LRA and avoid the previous situation where problems generally only come to light when the licensee decides to terminate the LRA.

The reporting requirements also act as an annual reminder to licensees of their obligations under LRAs and of the implications of not achieving the terms of the LRA. As all LRAs currently reflect requirements set out in clause 26(1) of the Regulation this reporting requirement would also be included in the terms of the LRA. This option best meets the objective of early identification of risks to LRA completion.

### 7.2.2 Costs and benefits of the amendment

Under the proposal to introduce annual LRA reporting requirements, it is expected that licensees will only need to provide a brief summary of the status of the works, an explanation for any delays and possible implications on the overall LRA time frame. The requirement for a progress report will incur an estimated three hours work for licensees for each year of the LRA.

The amount of follow-up work for DECC officers will be dependent on the content of the reports. It is estimated that the review of a report will be approximately two hours' work. If there are risk management issues arising from the report then there may be up to four days of meetings and discussions with the licensees about these problems and their possible solutions.

It is not possible to quantify the environmental benefits of the change since it would be necessary to know the number of LRAs that will be entered into over the five year lifespan of the new Regulation. It would also be necessary to know the type and volume of load reductions that would be included in each of these agreements, and the extent to which the reporting requirements improved the ability of the licensee to achieve the terms of the agreement.

Regular reporting will ensure that licensees are keeping track of the proposed and actual progress of pollution reduction works under their LRAs and that they inform DECC of any apparent issues with their ability to achieve the terms of that LRA. This would also facilitate improved management of LRA requirements by industry and government so that they achieve their potential pollution reductions.

Early identification of problems potentially affecting the successful conclusion of the LRA will lead to a greater likelihood of implementation of measures to achieve the LRA. If a termination is required, then this can occur earlier, incurring fewer costs for the licensee and for DECC as administrative costs would be lower and the licensee would have to repay less penalty interest.[30]

[30] If an LRA is unsuccessful on expiration or is terminated early, the licensee must repay in full any fee savings including penalty interest accrued by entering into an LRA.

### 7.2.3 Summary

The amendment introduces annual reporting requirements for licensees undertaking an LRA. The actual costs of introducing the amendment are expected to be small in comparison with the benefits of early identification of licensee problems in meeting LRA objectives. Requiring participating licensees to report on their progress is considered appropriate given the extent of fee savings achievable through an LRA.

# 8 Licensing reform

The current environment protection licensing system requires the same administrative effort, and consequential compliance costs for industry, regardless of the risk posed by the activity. Over almost a decade of regulating industry largely through licensing under the POEO Act, it is clear that some activities do not pose the same environmental risk as others.

In recognition of this, and to achieve the Government's priorities in reducing the regulatory burden on industry, DECC has adopted a risk-based approach to regulatory activities that provides for resources to be focused on activities that pose a higher risk to the environment. Of the 3,200 licences currently administered by DECC, about 20% are internally classified as 'high risk' and an intensive regulatory approach is taken for these licensed premises. High risk activities include the large emitters (air, noise, water) that are subject to LBL fees. The low risk licences, however, still require the same level of administrative support from DECC and the same level of administrative costs for industry.

DECC proposed to extend the environmental risk-based approach to licensed activities by regulating certain low risk activities via an alternative approach to licensing. DECC will still be able to take enforcement action (including prosecution) in the event of poor environmental management or a pollution incident. A foundation principle will be that DECC will remain the ARA for these activities. In other words, there will be no shifting of responsibility to local government.

The concept of using alternative tools for licences to regulate lower risk industries is not novel. Many State Government environment protection agencies around Australia rely on licensing only for high risk activities and a variety of alternative tools to regulate low risk ones. Examples of these alternative tools include notices (Victoria), accredited codes of practice (Queensland) and industry sector-based regulations (Western Australia).

The objective of this proposal was to reduce administrative and compliance costs for industry types identified as having a low environmental risk, to increase the parity of environmental requirements for these industry types with other jurisdictions, and as a result increase the appeal of conducting business in NSW.

## 8.1 Options considered

Two options were considered for licensing low risk activities:

Option 1 – no change

Option 2 – remove the licensing requirements from certain low risk activities and regulating their operation by existing environmental legislation provisions.

Option 1 continued the then situation where all activities that are licensed by DECC require the same administrative effort, and consequential compliance costs for industry, regardless of the risk posed by the activity.[31] This does not meet the government's goal to remove unnecessary red tape and cut costs for industry.

[31] The administrative fee varies between activities and for different levels of operations (such as production level) within the same activity based on the expected cost of DECC regulatory actions – DECC achieves only partial cost recovery from administrative fees.

Option 2 involved removing specific activities that are considered to be low risk from Schedule 1 of the POEO Act and the Regulation which would mean that they no longer require a licence from DECC to operate. It was estimated that of the 3,200 licences then administered by DECC, up to 1,000 premises licensed for concrete batching works, bitumen works, mobile plant or transport of non-trackable waste could be regulated by existing legislative provisions such as clean-up notices, prevention notices, penalty infringement notices and prosecutions. DECC's interactions with these activities are well understood and arise mainly as a result of localised amenity concerns (for example, dust or noise).

Option 2 was the preferred option because it will reduce red tape, cut costs for industry and government, and allow government resources to be focused on activities that pose a higher risk to the environment. This option will reduce red tape and cut costs for industry, in line with *NSW State Plan priority P3: reducing red tape*.

## 8.2 Costs and benefits of the amendment

Table 23 provides a summary of the activities where the licensing requirement has been removed, including a description of the activity and the typical environmental issues faced, plus an estimate of the licence numbers and administrative fees paid.

There are a number of direct cost savings for industry from the new Regulation:

- Occupiers that conduct the specified activity are no longer required to pay an annual licence administrative fee. This results in fee savings for these facilities in the range $200–$13,500 per annum depending on the activity and size of the operation. The total saving for industry would be about $1.8 million.
- There are also administration cost savings for industry since there is no longer a requirement to submit an Annual Return to DECC. It is estimated that each occupier would spend, on average, one hour completing this documentation leading to a saving for all occupiers of $63,895 per annum.[32]

There are no direct costs to industry from regulation by means other than licensing. Cost recovery from industry by DECC for any regulatory actions taken under existing provisions is discussed further below.

The costs and savings to government for the preferred option are as follows:

- Licensing revenue will decrease by about $1.8 million (5%).
- There will be a reduction in the administrative costs for government in regulating licensed facilities. DECC's administration costs will be reduced since there will no longer be Annual Returns for the affected licences – a savings estimated at $54,065 per annum.[33]

[32] Based on a cost of $65 per hour for 983 licences.
[33] Based on an average processing time of one hour per annual return costed at $55 per hour.

**Table 23: Summary of the activities affected by the amendment**

| POEO scheduled activity | Estimated number of current licences | Estimated total licence fees per annum | Typical environmental issues |
|---|---|---|---|
| **Bitumen pre-mix or hot-mix industries** – the mixing of crushed or ground rock with bituminous materials has a capacity to produce more than 150 tonnes per day or 30,000 tonnes per year. This activity does not include works of a temporary nature exclusively providing product for a construction site and located on or adjacent to that site. | 31 | $169,000 | Dust, noise |
| **Concrete works** that produce pre-mixed concrete and have an intended production capacity of more than 30,000 tonnes per year of concrete | 240 | $1,200,000 | Dust, noise |
| **Transport of non-trackable waste** – the transport of any one or more of the following types of waste for fee or reward (including occupiers of waste facilities, and persons who carry on waste activities, that are licensed under this Act and who transport any such waste to or from those facilities):<br>(a) **transport of hazardous waste or other waste** – the transport of hazardous waste, restricted solid waste, liquid waste, clinical and related waste or friable asbestos waste (or any combination of them) (not being excluded waste) of more than 200 kg in any load<br>(b) **transport of waste tyres** (not being excluded waste) of more than 200 tonnes in any year or 2 tonnes in any load | 618 | $361,000 | Small-scale spills, illegal dumping, litter<br><br>Note: DECC's waste tracking system with support or compliance enforcement will be an important tool for the ongoing regulation of waste transporters. |
| **Mobile plant activities** – includes any one or more scheduled activities carried out by means of mobile plant. | 94 | $45,000 | Dust, noise |
| **Total** | **983** | **$1,775,000** | |

### Cost recovery mechanisms

Under the POEO Act (as described in section 4), DECC can recover the administrative costs of issuing an environment protection notice (clean-up, prevention or noise control) and all reasonable costs and expenses under a compliance cost notice (in respect of an issued clean-up notice).

In the event of detected poor performance (highlighted through community complaints or a pollution incident), strong compliance enforcement action would be taken, with a focus on cost recovery to ensure compliance with environment protection requirements. Where regulatory action was necessary (for example, compliance inspections, reinspections, monitoring, assessments), DECC would recover the costs incurred.

### Improved integration of environmental planning and environment protection functions in development assessment

Central to the regulation of industry in NSW is the effective integration of consent/approval requirements and DECC licensing requirements. Failure to

integrate these requirements can complicate compliance issues for industry, government and the community. It can also represent a regulatory burden for industry. These issues have been raised as part of NSW Treasury's red tape review.

Under Part 3A (Major Projects), Part 4 (Integrated Development) and Part 5 of the *Environmental Planning and Assessment Act 1979*, DECC is required to provide its licensing requirements to the consent/determining authority, as part of the approvals/consent process. For development proposals that would continue to require a licence, DECC's current arrangements for providing approval/licence requirements to the consent/determining authority will remain. However, development proposals for activities subject to the proposed amendment will no longer require DECC's specific environmental requirements set out during the planning approval process, but will simply be subject to the general provisions for environmental protection that are set out in the POEO Act.

## 8.3 Summary

Streamlining industry's regulatory requirements and lowering costs by removing the need for licensing for specified scheduled activities of lower environmental risk will reduce red tape and cut administration costs for industry while still maintaining credible regulation. The costs and benefits from the proposal to remove licence requirements for specific low risk activities can be summarised as follows:

- Those low risk activities regulated through existing legislative provisions will no longer be required to pay annual licence fees (saving industry $1.8 million and reducing licensing revenue by the same amount) and the regulatory burden will be reduced as the requirement to provide an Annual Return detailing performance against licence conditions will also be removed.
- DECC will still be able to take enforcement action (including prosecution) in the event of poor environmental management or a pollution incident. Cost recovery mechanisms will support these processes.
- The planning approvals process will be simplified and streamlined for these activities. This approach accords with the government's current direction for reforms to the planning legislation.

The activities no longer requiring a licence would continue to be regulated by DECC using tools presently available under the POEO Act, including environment protection notices, penalty notices and prosecution provisions. Approximately 1,000 lower risk environmental activities could be regulated by this proposed approach. The proposal will rationalise, simplify and strengthen the regulatory framework for environment protection and improve the efficiency of its administration. These outcomes strongly accord with the government's current directions under the NSW State Plan.

# 9 Burning of biomaterial: requirements for electricity generation

In August 2002, the Premier announced the Government's intention to limit the use of native forest biomaterial for power generation, effective from 1 January 2003. The biomaterial policy seeks to achieve this by:

- prohibiting the development of stand-alone native forest biomaterial power plants (at present, there are no such plants in NSW)
- prohibiting the harvesting of native forests solely to supply biomaterial for power generation
- restricting the co-firing of native forest biomaterial in power plants to certain forest sources.

Forests NSW data shows that there is currently 2.3 million hectares of native forest in NSW.[34] The protection of native forests results in benefits to biodiversity, ecotourism and recreational amenity. Analysis of an effective global program for the conservation of wild nature found that preserving resources yields higher benefits than either sustainable harvesting or exploitation of the resources.[35] This finding is consistent with the government's policy on preserving native forests because they provide substantial long-term non-use benefits to the general community.

In 2003, an amendment to the Regulation included a prohibition on electricity generators from using native forest biomaterial other than that obtained from:

- authorised or existing plantations
- ancillary plantation operations
- land on which exempt farm forestry is being carried out
- sawdust or sawmill waste
- waste from wood processing.

The amendment also prescribed reporting requirements for affected electricity generators and established guidelines for record keeping and the preparation and auditing of reports.

Chapter 3B of the Regulation states that it is an offence for an occupier of any premises to use native forest biomaterial to produce electricity.[36] Electricity generation works are defined as being works that supply, or are capable of supplying, 200 kW of electricity. The reporting provisions of the Regulation only apply to those electricity generators that use forest biomaterial to generate electricity only. A licensee who generates electricity without burning any forest biomaterial is not required to report. The record keeping provisions were included to ensure that generators did not use native forest biomaterial in electricity generation (inadvertently or deliberately) and then record the biomaterials used under the name of a different fuel source.

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[34] Forests NSW (2004) *Seeing: Social, Environmental and Economic Report 2003/04*, p8, www.forest.nsw.gov.au/publication/e_sv/03-04/default.asp.

[35] Balmford A. et al. (2002), Economic reasons for conserving wild nature, *Science* 297, 950–95.

[36] Chapter 3B of the Regulation also includes provisions for biomaterial reports sent to DECC to be made publicly available, offences for providing false information, that DECC establish guidelines as to the keeping of records, and the preparation and auditing of reports, and declaring the EPA as the ARA for any matter arising under this chapter.

DECC's implementation of the biomaterial reporting requirements indicates that while protection of native forests in NSW continues to be an important issue, the continuation of the requirement for electricity generators to report on their biomaterial use has returned no perceivable environmental benefits.

This section outlines an amendment to the reporting requirements for electricity generating facilities which burn biomaterial.

## 9.1 Background

Implementation of the provisions to date indicates that the volume of forest biomaterial being used to generate electricity is insignificant. DECC undertook extensive communication with local councils during development and implementation of the Regulation so that local councils could assist to educate affected facilities in their area about the new requirements of the Regulation and to ensure that these new requirements were understood by affected facilities.[37]

In 2004–05, biomaterial reports were received from five licensed premises. The majority of premises (identified through the communication program at the beginning of the reporting year) reported that they had not used forest biomaterial over the reporting period.

While the policy was intended to target both non-licensed and licensed premises, *only licensed premises submitted a biomaterial report*. No non-licensed electricity generators reported using biomaterials for electricity generation. DECC undertook a review of the information provided in the biomaterial reports and all reports received were found to comply with the requirements of the Regulation and the *Guidelines for the Burning of Biomaterial: Record Keeping and Reporting Requirements for Electricity Generating Facilities*.[38]

Additional compliance measures were considered to return limited environmental benefits compared to the resources required for their implementation.[39]

DECC's review found that:

- the proportion of electricity created from burning biomaterial averages less than 2% for licensed coal-fired electricity generators; the total output of these generators is reported to be 32,700 gigawatt hours
- two licensed premises not licensed under electricity generation submitted a report
- all reports from affected electricity generators complied with the requirement for their reports to be certified by an independent auditor prior to being lodged with DECC
- while the Regulation includes provisions for public access to annual biomaterial reports, DECC received no requests to access these reports.

[37] Prior to commencement of the biomaterial reporting provisions, local councils were the ARA for premises that were not licensed under Schedule 1 of the POEO Act but supplied or were capable of supplying over 200 kW of electricity.

[38] www.environment.nsw.gov.au/resources/legislation/biomaterial0510.pdf

[39] Compliance approaches considered included comparison of the amount of energy generated by burning biomaterial reported to DECC with information provided under the Mandatory Renewable Energy Target scheme at www.greenhouse.gov.au/renewabletarget/index.html (through both the REC registry at www.rec-registry.gov.au/ and annual reports to the Office of the Renewable Energy Regulator), and the amount of electricity from biomaterial reported to the Australian Greenhouse Office.

The amendment removes the reporting requirement while maintaining the prohibition on electricity generators from using native forest biomaterial other than that obtained from:

- authorised or existing plantations
- ancillary plantation operations
- land on which exempt farm forestry is being carried out
- sawdust or sawmill waste
- waste from wood processing.

It will continue to be an offence to generate electricity using native forest biomaterial defined in clause 57L of the Regulation. DECC will continue to be the ARA for any matter arising under Chapter 3B.[40]

Authorised DECC officers would be able to enforce the prohibition as per the general offence provision (clause 57L) as the amendment retains this prohibition.

DECC continues to administer some licences that include specific conditions relating to the amount of biomaterial that may be used in the co-firing process.[41] In addition, DECC will continue to be able to ensure compliance with clauses 57L and 57M of the General Regulation through, for example, targeted inspections, requests for information under section 191 or section 193 if non-compliance is suspected, compliance audit, and mandatory audit provisions in the POEO Act.

## 9.2 Options considered

Two options for amending the reporting requirements for burning native forest biomaterial were considered:

Option 1 – no change (base case)

Option 2 – remove the reporting requirements from the Regulation.

Under option 1, the record keeping and reporting requirements for electricity generators who burn forest biomaterial to submit an annual biomaterial report to DECC would continue.

Option 2 removes all reporting requirements from the Regulation and also removes the:

- requirements for biomaterial reports sent to DECC to be made publicly available (clause 57O)
- requirement that DECC establish guidelines regarding the keeping of records, and the preparation and auditing of reports (clause 57Q).

[40] Clause 57R of the Regulation declares the EPA as the ARA for Chapter 3B of the current Regulation.
[41] Macquarie Generation has, under its licence, an agreement that wood waste must only be fed to the boiler at a rate of less than or equal to 5% of the coal feed rate. Delta Electricity has, under its licence, an agreement that solid alternative fuel may only be fed to the boiler at a rate of less than or equal to 5% weight of the coal feed rate.

## 9.3 Costs and benefits of the amendment

There are not expected to be any additional costs associated with the amendment for industry or government; however, both groups will face reduced costs, for example:

- industry no longer has to report on their biomaterial usage and comply with the requirement for biomaterial reports to be independently certified. This represents a saving to industry of $30,000 per year.
- DECC no longer administers the reporting requirements, leading to savings that have been estimated at $10,000 per year.

Under the option, there is a small risk that the use of prohibited native forest biomaterial sources for electricity generation will increase. However, it is difficult to quantify both the amount of native forest biomaterial that is currently being used in the co-firing process for electricity generation, and the change that will result from the amendment.

This risk is expected to be reduced for premises that are licensed by DECC because DECC officers would have more contact with these premises and greater opportunity to incorporate conditions on biomaterial usage into the licence and/or enforce the prohibition, if required.

As outlined above, DECC data indicates that all electricity generating premises that use biomaterial for electricity are licensed by DECC. Local councils are the ARA for premises that have electricity generating capacities that are under the licensing threshold in Schedule 1 of the POEO Act. This will not change as a result of the amendment.

While data compiled by DECC indicates that biomaterial being used by small electricity generating premises is minimal, the prohibition and the offence provisions continue under this option, signalling a message to industry and the community that native forest biomaterial should be protected and providing a deterrent for clearing native forests to produce fuel to generate electricity.

The change also affects the principle of community right to know. The reporting provisions require that reports by electricity generators which use forest biomaterial to generate electricity are made available to the public upon request. This ensures that the community right to know needs are met.

DECC undertook an extensive communication plan during the development of the current regulatory provisions and it is considered that sufficient measures have been taken to ensure that the community is aware that affected electricity generators are required to report this information and that this information can be obtained from DECC on request. For licensed premises, all stakeholders could participate in the licence review process.

To date, the community has not exercised the right to access this information. The information and community right to know benefits have not been quantified but are considered lower than the cost to government and industry to administer and comply with the reporting and recording requirements of the previous Regulation.

The new Regulation continues the prohibition against using native forest biomaterial for electricity generation, and DECC can still use its regulatory powers to address any non-compliance where biomaterial is found to be used for electricity generation.

The requirements to keep records and the offence and penalty provisions still apply.[42]

For licensed premises, DECC can request information on biomaterial reporting through licence conditions, section 191 or 193 notices. In addition, non-compliance with the prohibition could be identified through site inspections.

For licensed facilities, the incorporation of site-specific conditions relating to the use of prescribed biomaterial sources (for example, based on permissible biomaterial sources in the surrounding area) could assist DECC officers to monitor biomaterial usage in the area and assess the probability that valuable native vegetation would be used to generate electricity. Given the information collected to date this appears to be unwarranted but if future information provided evidence to the contrary, this approach could be considered.

## 9.4 Summary

DECC's assessment suggests that the environmental benefits from continuing the requirement to report on biomaterial use in electricity generation under the base case do not justify or outweigh the cost to industry of complying with the reporting requirements or the cost to government of administering the reporting requirements. The amendment will result in significant savings for both DECC and industry.

The recording, prohibition and offence provisions continues under option 2, signalling a message to industry and the community that native forest biomaterial should be protected and providing a deterrent from clearing native forests to generate electricity. DECC-authorised officers can enforce the prohibition which will remain in the Regulation. In addition, DECC will continue to administer a number of electricity generation licences with specific conditions to allow the use of biomaterial in the co-firing process if necessary.

[42] The maximum penalty for a corporation is 400 penalty units and 200 penalty units for an individual.

# 10 Licensing of Forests NSW activities

Forests NSW is the only licensee that conducts the fee-based activity 'Logging operations'. In 1999, a review of these licences was undertaken in response to issues associated with the incorporation of the environment protection licence into integrated forestry operations approvals (IFOAs) issued under the *Forestry and National Park Estate Act 1998*. The purpose of IFOAs is to integrate the regulatory regimes for environmental planning and assessment, the protection of the environment and threatened species conservation.

One option considered was to retain the existing single licence covering Forests NSW activities; alternatively, multiple licences applicable to areas subject to IFOAs, as well as licences for non-IFOA operations, could be issued. The decision was made that five environment protection licences were to be issued to Forests NSW – four IFOA licences and one non-IFOA licence. This would avoid the legal and administrative complexity of issuing and maintaining a single licence linked to multiple IFOAs. Subsequently a sixth licence has also been issued.

Under the previous Regulation, licences for the fee-based activity 'Logging operations' attracted an administrative fee based on 5,500 fee units per licence. The size of the fee was based on the recovery of costs associated with the regulation of logging activities across the state, as covered by one licence. The decision to issue an additional five licences to reflect the IFOAs resulted in an increase in licence fees for Forests NSW of $2.09 million.

In 1999, the Director General of DECC endorsed a proposal to 'exempt' Forests NSW from paying more than one administrative fee. In accordance with clause 15(1) of the Regulation, a 'notional' refund of the fees for five of the licences was granted. In effect, Forests NSW only pays the equivalent of one licence fee for six licences.

The objective of the amendment is to change the way that 'Logging operations' are licensed in order to remove the administrative burden for DECC and the licensee repaying licence fees.

## 10.1 Options considered

Two options for amending the current way that forestry licences are administered were considered:

Option 1 – no change (base case)

Option 2 – reduce the number of administrative fee units for the fee-based activity 'Logging operations'.

Under option 1, the 5,500 administrative fee units would continue to apply for logging operations and DECC would be required to continue to refund the fees for five licences to Forests NSW according to the agreement in 1999. This would not reduce the administrative burden for either DECC or the licensee and so was not the preferred option.

Under option 2, the number of administrative fee units payable for logging operations is reduced from 5,500 to 920 (or $92,000 per licence). This proposal removed the requirement for DECC to 'notionally' refund fees each year.

For government, there would be no impact on the overall revenue collected. Given that licence fees for all licences would be paid and no refunds made, this option meets the objective of reducing the administrative burden for DECC and Forests NSW associated with repaying licence fees. Hence, this was the preferred option.

## 10.2 Costs and benefits of the amendment

There are not expected to be any additional costs associated with the new Regulation for industry or government, although both groups will face reduced administrative costs associated with the repayment of fees for four licences. These cost savings are minor.

Under the preferred option, there is a small possibility that Forests NSW may surrender five of the six current licences and vary the remaining licence to cover all activities, resulting in a decrease in revenue of $460,000. While this is a possibility, it is not likely to occur as this change would require Ministerial approval.

## 10.3 Summary

The preferred option of decreasing the number of licence administrative fee units for logging operations from 5,500 to 920 has the benefit of being revenue neutral and of removing the administrative burden of repaying fees each year. Potentially this may lead to Forests NSW surrendering five of the current licences and varying the remaining licence to cover all activities, resulting in a decrease in revenue of $460,000. While this is a possibility, it is not likely to occur as this change would require Ministerial approval.

# 11 Exemption for cold water pollution offences for the Snowy Hydro Corporation

The previous Regulation exempted an entity from prosecution if its works comply with specific conditions that would require investigation and works to address cold water pollution under the *Water Management Act 2000*. These conditions can be placed on works approvals through existing provisions in the *Water Management Act 2000.*

Jindabyne and Tantangara dams are operated by Snowy Hydro Corporation and regulated by the Snowy Water Licence (under the *Snowy Hydro Corporatisation Act 1997*). Therefore these dams are not currently covered by the Regulation.

The amendments to the Regulation provide an exemption for the Jindabyne and Tantangara dams operated by Snowy Hydro Corporation if they comply with the specific licence conditions relating to cold water pollution.

It is also proposed that the Snowy Hydro Corporation's licence be updated (through a licence review) in parallel with the new Regulation. This review will involve the inclusion of new conditions relating to cold water pollution to give effect to the exemption from cold water pollution.

# Appendix 1: Calculating load fees

The pollutant load fee is calculated using one of two equations depending on whether the assessable load is greater than or less than the FRT. The pollutant fee increases at the FRT which is a reasonably achievable discharge level above which the fee rate doubles. Where the assessable load is greater than the FRT, the licensee is penalised and is required to pay double the load fee for that portion of assessable load greater than the FRT. The equations are:

If AL < FRT

$$\text{pollutant load fee} = (AL \times PW \times CZ \times PFU) / 10{,}000$$

If AL > FRT

$$\text{pollutant load fee} = ((2 \times AL - FRT) \times PW \times CZ \times PFU) / 10{,}000$$

where:

- AL = the assessable load measured in kilograms for each ‘assessable pollutant’ which must be determined in order to calculate the total load fee for any licence year
- PW = the pollutant weighting which accounts for the impact of the pollutant
- CZ = the pollutant critical zone weighting which accounts for the sensitivity of the receiving environment
- PFU = the pollutant fee unit (PFU)
- FRT = fee rate threshold which is equal to the FRT factor multiplied by the actual quantity of activity for that activity.

# Appendix 2: Environmental impacts of pollutants

### Arsenic

Arsenic is a known human carcinogen. Inhalation of arsenic has been shown to be strongly associated with lung cancer, while ingestion of arsenic has been linked to a form of skin cancer and also to bladder, liver, and lung cancer. Arsenic is known to induce cardiovascular diseases, developmental abnormalities, neurologic and neurobehavioural disorders, diabetes, hearing loss and hematologic, gastrointestinal, renal and respiratory disorders.

As a water pollutant, arsenic has a high toxicity to aquatic life and can bioaccumulate in fish and shellfish. It only has a moderate chronic toxicity to birds and land animals.

### Benzene

Benzene is an air toxic that can adversely affect human health and the environment even at very low concentrations. Long-term exposure to benzene can have carcinogenic and genotoxic effects, causing direct damage to genetic material.

### Benzo[a]pyrene

BaP is a probable human carcinogen that may also cause genetic and reproductive damage in humans. It is moderately persistent in the environment. It readily binds to soils and if released to water, will adsorb very strongly to sediments and particulate matter.

### Biological oxygen demand

Reduced availability of oxygen in water increases environmental stresses on most aquatic organisms and can cause death. At reduced dissolved oxygen concentrations it is known that many toxic compounds become increasingly toxic. The toxicity of zinc, lead, copper, pentachlorophenol, cyanide, hydrogen sulfide and ammonia all increase at low dissolved oxygen concentrations. Decrease in the dissolved oxygen concentration can be detrimental to aquatic ecosystems.

### Cadmium

Cadmium has a high toxicity to aquatic life. There is limited information on the short and long term effects of cadmium on terrestrial plants and animals, except in test animals which developed lung and testicular cancer.

### Chromium

Chromium compounds, in particular chromium(VI) compounds, can result in the death of animals, birds and fish, and death or low growth rates in plants. Chromium(VI) also has a high potential for accumulation in fish as it does not break down or degrade easily.

### Coarse particulates

Concerns about coarse particles are generally more about nuisance, such as damage to or soiling of materials, or adverse effects on sensitive vegetation through surface coating. However, if coarse particles are contaminated by other materials such as lead, health can be affected as a result of ingestion.

### Copper

Copper is readily accumulated by plants and animals. Toxic effects of metals occur when the rate of uptake exceeds the rates of physiological or biochemical detoxification and excretion. It can reduce photosynthesis in blue–green algae.

### Fine particulates

Fine particulates have been linked to asthma and other health effects and can cause death to the sick and aged. Concern is growing about the health risks of finer fractions of particles as these can travel into the lower respiratory tract. These particulates provide large surface areas for the adsorption of acid gases and reduce ultraviolet light from the sun. This causes light scattering and reduced visibility.

### Fluoride

Fluoride emissions can cause plant damage and reduce crop yield at quite low concentrations. Fluorosis can occur in cattle grazing on grass exposed to fluorides.

### Hydrogen sulfide

Hydrogen sulfide has a high, acute (short-term) toxicity to aquatic life, birds and animals. There is limited information on long-term effects. In humans, it is toxic at concentrations from two to five parts per million and rapidly causes unconsciousness.

### Lead

Lead is a heavy metal and, when present in the body, can impair brain function, especially in children. It adversely affects several body organs and systems, with changes in cell functioning and nervous system development appearing to be the most sensitive to increasing lead exposure.

The full impact of lead on an ecosystem and its biota is also not well understood, although its toxic effects on all organisms are widely recognised. Crustaceans are extremely sensitive, and molluscs and polychaetes are known to have a particularly high uptake of lead. Waterfowl that ingest lead shot or fishing sinkers when shovelling sediment for food experience damage to the nervous system, kidneys and liver, paralysis, and inhibition of haemoglobin synthesis, which lead to death.

### Mercury

Mercury exposure at high levels can result in clinically observable neurotoxicity, for example, mad hatters' disease. Exposure can also result in subtle decrements in motor skills and sensory ability, tremors, inability to walk and convulsions, harm the brain, heart, kidneys, lungs, and immune system of people of all ages. It has been demonstrated that high levels of mercury in the bloodstream of unborn babies and young children may harm the developing nervous system, causing learning difficulties.

As a water pollutant, mercury is not as toxic to fish as some other metals, such as cadmium, copper, lead or zinc. The concentrations of mercury in most surface waters are generally much too low to cause any direct toxic effects to either adult fish or the more sensitive early life stages. The main danger is methylmercury, which accumulates in the internal organs and disrupts the central nervous system. Even low levels of mercury cause muscle break-down, weight loss and reduced fertility in some waterbirds.

### Nitrogen oxides

$NO_x$ contribute to acid rain and are precursors to photochemical smog. They may irritate respiratory systems, exacerbate asthma in susceptible individuals, and increase susceptibility to cardiovascular disease and respiratory infections.

### Nutrients including total nitrogen and total phosphorus

Excessive quantities of nutrients can lead to degradation of water quality due to rapid growth and multiplication of algae and macrophytes. This can lead to a number of environmental impacts on waterways, including:

- increased turbidity and lowering of dissolved oxygen levels
- reduced diversity of aquatic animals and change in community structure
- impediment to fish migration
- reduced photosynthesis
- creation of odour and unsightly appearances which lead to loss of recreational amenity
- in some cases toxic blooms of cyanobacteria and algae causing fish kills and rendering water unfit for human consumption.

### Oil and grease

As a surface slick, oil decreases sunlight penetration, reduces re-aeration of the water and is unsightly. Oil and grease can cause coating of the intertidal shoreline and also result in a visible stain at the waterline of watercraft. Waterbirds are also affected by oil and grease, either by ingestion or by coating their plumage. Bacterial action and weathering will eventually decompose oil and grease. High levels of surfactants used to treat oil spills are toxic to fish, invertebrates and macrophytes. They can reduce photosynthesis, affecting algae and seagrass growth.

### Pesticides and PCBs

Most organic pesticides, polychlorinated biphenyls and industrial organic chemicals are toxic to aquatic organisms. Some also bioaccumulate in the food chain.

### Salt

Changes in salinity may affect aquatic organisms in two ways:

- directly by toxicity through physiological changes (particularly osmoregulation) – both increases and decreases in salinity can have adverse effects
- indirectly by modifying the species composition of the ecosystem and affecting species that provide food or refuge.

### Selenium

Selenium and its compounds have high acute toxicity to aquatic life and mammals and moderate acute toxicity to birds. Fish can bioaccumulate selenium, building up high levels. Alkali disease is a disease in livestock resulting from chronic consumption of high levels of selenium and is characterised by hair loss, deformation of hooves, anaemia, erosion of joints, and effects on the heart, liver and kidneys.

### Sulfur oxides

$SO_x$ are the principal pollutants associated with acid deposition. The impacts of acid deposition include corrosion of iron and steel, reduced crop yields, damage to vegetation and acidification of freshwater lakes.

In particular, sulfur dioxide ($SO_2$) is a respiratory irritant which is most dangerous when adsorbed onto fine particulate matter. It is toxic to humans at around 10 parts per million (over eight hours). Exposure to ambient levels of sulfur dioxide has been associated with reduced lung function and increased incidence of respiratory symptoms and diseases.

### Total suspended solids

The main impacts of suspended solids are reduced penetration of sunlight through water (which reduces the biological activity of aquatic organisms), smothering of bottom-dwelling biota by sediment, and clogging gills of fish. Other environmental impacts include:

- reduced light penetration, affecting photosynthesis rates of algae, submerged macrophytes and seagrass
- clogging of gills of fish and invertebrates
- hindering feeding of some macroinvertebrates
- reduced substrate habitat value, including voids, affecting some fish and invertebrates which need voids for feeding and respiration
- rapid siltation which smothers seagrass meadows and estuarine soft sediment habitats
- increased deposition of inert sediments which can reduce food supplies for some invertebrates and increased organic matter which can alter invertebrate species
- taste and appearance of water supply.

### Total phenolics

Acute toxic effects may include death of animals and death or low growth rate in plants. Longer term effects may include shortened lifespan and reproductive problems.

### Polycyclic aromatic hydrocarbons

Although many different PAHs have been identified, there is limited published toxicological data on them. One of the best characterised and most toxic PAH is benzo[a]pyrene, discussed above.

### Volatile organic compounds

The major environmental significance of VOCs is their role in the formation of photochemical smog. In the lower atmosphere, ozone is formed by the reaction of $NO_x$ and VOCs in warm, sunny conditions. Other environmental effects depend on the composition of the VOCs, their concentration and the length of exposure. Effects may also occur due to secondary impacts, for example, smog. In liquid form and in solution, VOCs can impact water and soil.

The health effects also depend on the specific composition of the VOCs, the concentration and the length of exposure. General effects of lower concentrations include eye, nose, and throat irritation, headaches, loss of coordination, nausea, and damage to liver, kidneys, and the central nervous system. Some VOCs can cause cancer in humans and animals.

### Zinc

The toxicity of zinc in water is influenced by water hardness and pH; water is less toxic with greater hardness and pH. Generally, zinc is acute and chronic toxic to aquatic life in polluted waters.

# Appendix 3: Revenue projections for all amendments

The table summarises the projected revenue for the changes outlined in this document for the five years of the new Regulation.

| Fee-based activity | 2007–08 revenue | 2008–09 revenue | Fee increase from FRT changes from 2009–10 onwards | 2009–10 revenue | Fee increase from new APs from 2009–10 onwards | 2010–11 revenue | 2011–12 revenue | 2012–13 revenue |
|---|---|---|---|---|---|---|---|---|
| Agricultural phosphate fertiliser production | $19,882 | $19,882 | $0 | $20,887 | $0 | $21,421 | $21,939 | $22,492 |
| Aluminium production (alumina) | $474,607 | $474,607 | $88,592 | $587,220 | $9,914 | $611,887 | $627,191 | $642,805 |
| Aluminium production (scrap metal) | $107,322 | $107,322 | $3,487 | $116,231 | $0 | $119,211 | $122,077 | $125,159 |
| Ammonium nitrate production | $132,938 | $132,938 | $0 | $139,666 | $0 | $143,175 | $146,756 | $150,409 |
| Carbon black production | $2,500 | $2,500 | $0 | $17,325 | $261,365 | $261,365 | $267,902 | $274,571 |
| Cement or lime handling | $39,200 | $39,200 | $0 | $41,160 | $0 | $42,336 | $43,120 | $44,296 |
| Cement or lime production | $409,113 | $409,113 | $2,393 | $429,835 | $61,948 | $500,785 | $512,774 | $525,740 |
| Ceramics production | $293,598 | $293,598 | $41,020 | $348,772 | $0 | $357,755 | $366,276 | $375,554 |
| Chemical storage – petroleum | $233,209 | $233,209 | $0 | $244,992 | $0 | $251,265 | $257,321 | $263,813 |
| Coke production | $56,555 | $56,555 | $1,335 | $60,753 | $285,543 | $347,822 | $356,522 | $365,397 |
| Electricity generation from coal | $14,299,287 | $14,299,287 | $233 | $15,023,239 | $228,274 | $15,628,942 | $16,019,863 | $16,418,682 |
| Electricity generation from gas | $181,622 | $181,622 | $33,215 | $224,030 | $0 | $229,658 | $235,402 | $241,263 |
| Glass production – container glass | $708,620 | $708,620 | $0 | $744,485 | $60,744 | $823,933 | $844,542 | $865,567 |
| Glass production – float glass | $397,181 | $397,181 | $0 | $417,283 | $0 | $427,766 | $438,466 | $449,382 |
| Iron and steel production (iron ore) | $4,150,626 | $4,150,626 | $290,724 | $4,651,423 | $330,858 | $5,099,139 | $5,226,682 | $5,356,801 |
| Iron and steel production (scrap metal) | $139,062 | $139,062 | $2,928 | $149,018 | $43,633 | $196,455 | $201,253 | $206,306 |
| Non-ferrous metal production (ore concentrates) | $79,500 | $79,500 | $0 | $83,475 | $0 | $85,860 | $87,450 | $89,835 |
| Non-ferrous metal production (scrap metal) | $57,642 | $57,642 | $1,945 | $62,494 | $0 | $64,124 | $65,612 | $67,289 |
| Paint/polishes/adhesives production | $129,215 | $129,215 | $36,340 | $171,674 | $0 | $176,237 | $180,161 | $184,827 |
| Paper or pulp production | $117,009 | $117,009 | $2,219 | $125,140 | $0 | $128,343 | $131,438 | $134,753 |
| Petrochemical production | $680,871 | $680,871 | $0 | $715,320 | $0 | $733,360 | $751,570 | $770,330 |
| Petroleum and fuel production | $2,591,671 | $2,591,671 | $32,182 | $2,754,893 | $90,754 | $2,914,951 | $2,987,682 | $3,062,128 |
| Plastics reprocessing | $189,002 | $189,002 | $1,238 | $198,556 | $0 | $203,687 | $208,505 | $213,799 |
| Recovery of waste oil | $6,500 | $6,500 | $0 | $6,825 | $0 | $7,020 | $7,150 | $7,345 |
| Sewage treatment – large plants | $6,955,472 | $6,955,472 | $0 | $7,307,398 | $0 | $7,491,612 | $7,677,776 | $7,869,371 |
| Sewage treatment – small plants | $2,472,444 | $2,472,444 | $0 | $2,597,424 | $0 | $2,663,604 | $2,728,436 | $2,797,029 |

| Fee-based activity | 2007–08 revenue | 2008–09 revenue | Fee increase from FRT changes from 2009–10 onwards | 2009–10 revenue | Fee increase from new APs from 2009–10 onwards | 2010–11 revenue | 2011–12 revenue | 2012–13 revenue |
|---|---|---|---|---|---|---|---|---|
| Thermal treatment of hazardous and other waste | $6,500 | $6,500 | $0 | $6,825 | $0 | $7,020 | $7,150 | $7,345 |
| **Revenue from LBL premises** | **$34,914,649** | **$34,914,649** | **$537,851** | **$37,229,018** | **$1,373,032** | **$39,520,911** | **$40,502,866** | **$41,513,643** |
| **Revenue from non-LBL premises** | $7,465,750 | $7,465,750 | | $7,839,038 | | $8,063,010 | $8,212,325 | $8,436,298 |
| **Revenue from non-LBL premises subject to licensing reform** | $1,775,000 | $1,775,000 | | $0 | | $0 | $0 | $0 |
| **Total licensing revenue** | **$44,155,399** | **$44,155,399** | | **$45,068,056** | | **$47,583,921** | **$48,715,191** | **$49,949,941** |