Regulatory Impact Statement

Proposed Pesticides Regulation 2017

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Environment Protection Authority

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Executive summary

The *Pesticide Act 1999* (the Act) controls the use of pesticides in New South Wales. The Act aims to reduce the risks to human health, the environment, property, industry and trade from the use of pesticides. The Pesticides Regulation 2009 (the Regulation) facilitates these aims by setting out requirements for mandatory pesticide record-keeping, training, licensing and the notification of some pesticide uses.

The Regulation is due for staged repeal 1 September 2017. In accordance with the *Subordinate Legislation Act 1989* this Regulatory Impact Statement (RIS) has been prepared to assess the proposed Pesticide Regulation 2017 (the proposed Regulation).

The proposed Regulation aims to:

- facilitate compliance with the provisions of the Pesticides Act
- reduce externalities caused by inappropriate pesticide use
- implement in NSW national harmonisation commitments agreed to in the updated May 2013 National Scheme for Assessment, Registration and Control-of-use of Agricultural and Veterinary Chemicals
- implement the provision of the March 2015 Memorandum of Understanding between the NSW Government and the NSW Farmers Association, *NSW Farming: Investing Locally, Connecting Globally* relating to pesticide user training.

The proposed Regulation will carry forward the majority of the provisions of the current Regulation, but will introduce changes including:

- introducing new licensing categories in line with the national harmonisation model
- providing an alternative option for maintaining user competency after initial training
- providing simplified record keeping requirements for the majority of pesticide users
- adding universities to the definition of public authorities required to give notice of pesticide use in public places
- updating penalty amounts to account for movements in the consumer price index and better reflect the seriousness of offences.

This RIS assesses the proposed changes compared to the base case of no regulation and the option of remaking the current Regulation with no changes.

Key findings of the analysis of the quantifiable benefits and costs show that, compared to the option of keeping the current Regulation, the proposed Regulation would have incremental net quantifiable benefits to NSW, with a benefit cost ratio of 1.7.

The proposed Regulation is associated with higher licensing costs for industry and Government but lower overall user training and record keeping costs. Compared to the base case of no regulation the costs of the proposed Regulation are outweighed by the benefits of improved agricultural and other production, reduced risk to trade, avoided health costs and avoided environmental damage. There are also further unquantifiable benefits. These mainly arise from lack of quantitative data, especially related to Australia specific scenarios such as avoided pesticide damage to the natural environment and reduced costs to industry from pest resistance.

The conclusion is that the proposed Regulation should be made.

1 Introduction

The *Pesticides Act 1999* (the Act) controls the use of pesticides in New South Wales. The Act aims to reduce the risks to human health, the environment, property, industry and trade from the use of pesticides. The Pesticides Regulation 2009 (the Regulation) facilitates these aims by setting out requirements for mandatory pesticide record-keeping, training, licensing and the notification of some pesticide uses.

The EPA has reviewed the existing Regulation in preparation for its remake before it lapses on 1 September 2017. As required by the *Subordinate Legislation Act 1989* this Regulatory Impact Statement has been prepared for the proposed Pesticide Regulation 2017 (the proposed Regulation). As required, it also addresses the 'better regulation principles' (NSW Government 2009) for the proposed Regulation (as demonstrated in Appendix A).

1.1 Purpose of this document

The *Subordinate Legislation Act 1989* provides for the staged repeal of statutory rules, including regulations, every five years. Under the program of staged repeal Regulations which are due for repeal may:

- be allowed to lapse
- be remade with major or minor amendments
- have their repeal postponed by one year if exceptional circumstances exist.

The Regulation is due to lapse in September 2017. The EPA has prepared this Regulatory Impact Statement (RIS) to assess the economic, social and environmental costs and benefits of any replacement Regulation and its alternatives. The intention is to ensure that the proposed Regulation provides the best approach for achieving its desired objectives. The RIS must provide justification for the proposed Regulation by showing that it will result in the greatest net benefit, or least cost, to the community compared with the alternatives. It must also conform to the NSW Government's 'better regulation' requirements (Appendix A) and apply the IPART Licensing Framework (Appendix D)

Permission was granted on several occasions to postpone the repeal of the existing Regulation until 1 September 2017. The last postponement was approved because a substantial part of the Regulation was amended in 2015 with the passage of the *Pesticides Amendment Bill 2015*. Those amendments allowed for a new licensing regime to be defined by the Regulation to facilitate implementation of commitments made by NSW to harmonise state and territory pesticide legislation, as agreed by the Council of Australian Governments (COAG). The updated May 2013 National Scheme for Assessment, Registration and Control-of-use of Agricultural and Veterinary Chemicals also includes harmonised minimum training and record keeping requirements[1].

The proposed Regulation will continue the majority of current requirements, but will align licensing categories, minimum competency standards for users of higher risk products and record keeping by non-licensed users with the agreed national harmonisation model. It will reduce regulatory burden for many occupational pesticide users by streamlining record keeping requirements and providing an alternative pathway for recognising continued competency of pesticide users. It will also improve the public's right to know about pesticide use in public places by explicitly including universities in the definition of public authorities, who since 2007 have been required to provide notification in accordance with a publicly posted notification plan.

[1] See Intergovernmental Agreement (IGA) to COAG - Department of Agriculture and Water Resources.

1.2 Preliminary consultation

The EPA has undertaken preliminary consultation with key stakeholders prior to the development of the proposed Regulation. In July 2016 the EPA wrote to a range of interested parties advising them of the review and seeking their views on any relevant matters the EPA should consider when developing the amendment proposals.

1.3 Making a submission

The EPA invites you to make written submissions on this Regulatory Impact Statement and on the proposed Pesticide Regulation 2017.

Submissions can be made online on the Pesticides Regulation page. Written submissions can also be:

- posted to
  Manager Chemicals Reform, Hazardous Materials
  Chemicals and Radiation
  NSW Environment Protection Authority
  PO Box A290
  Sydney South NSW 1232
- emailed to chemicals.reform@epa.nsw.gov.au

Submissions will be accepted until 5pm 7 July 2017.

2 Framework for the regulation of pesticides in NSW

2.1 Roles and responsibilities at the national and state levels

Pesticides are controlled in Australia through an inter-governmental arrangement known as the National Registration Scheme for Agricultural and Veterinary Chemicals. Under this scheme the Australian Pesticides and Veterinary Medicines Authority (APVMA) is the Commonwealth agency responsible for assessment and registration of pesticides in Australia and their regulation up to and including the point of sale.

The States and Territories are responsible for controlling the use of pesticides beyond the point of sale, that is, for their use, storage and disposal.

2.2 The NSW Pesticides Act 1999

The *NSW Pesticides Act 1999* regulates and controls the use of pesticides in NSW. It applies to both urban and agricultural situations. The Act aims to reduce the risks to human health, the environment, property, industry and trade associated with the use of pesticides. The Act also aims to promote collaborative and integrated policies for the use of pesticides.

Under the Act, all pesticide users in NSW must:

- only use pesticides registered or permitted by the APVMA
- obtain an APVMA permit if they wish to use a pesticide in a way not covered by the label
- read the approved label and/or APVMA permit for the pesticide product (or have the label/permit read to them) and strictly follow the directions on the label
- only keep registered pesticides in containers bearing an approved label
- prevent injury to people, damage to property and harm to non-target plants and animals through the use of a pesticide.

Section 119 of the Pesticides Act provides for regulations to be made covering any matter required or permitted by the Act to give effect to the aims of the legislation. Regulations may therefore be made with respect to:

- licences and licence applications
- restricted pesticides authorisation and applications for authorisations
- matters relating to applicants and holders of such authorisations
- record-keeping in relation to pesticide use, supply, distribution and disposal
- training and qualification requirements
- the approval of training courses and qualifications in relation to the use of pesticides
- fees (including their waiving, remittal, reduction or refund)
- standards for the application of pesticides
- standards for the design and construction of aerial spraying equipment and its installation or attachment to, or in, aircraft
- the recognition of licences or other authorities issued by another State/Territory that correspond to, or are similar to, licences under the Act
- the circumstances in which a recognised licence or other authority is taken to be a licence granted under the Act
- notification of pesticide use
- requirements that an application or other information provided under the Act or regulations is verified by statutory declaration.

The EPA administers and enforces the Act and is therefore responsible for enforcing the proper use of pesticides in NSW after the point of sale. This includes pesticide use in agriculture, on public lands and at domestic and commercial premises. The EPA encourages

pesticide users to improve their management of pesticides through education programs and by facilitating communication among the various stakeholder groups.

For more information about the *Pesticides Act 1999*, visit EPA's website.

2.3 Other relevant legislation and agencies

NSW legislation

Other NSW legislation may also be used to control some activities associated with the use of pesticides.

Protection of the Environment Operations Act 1997 (POEO Act) provides key mechanisms for protecting the environment and improving environmental outcomes in NSW. The POEO Act contains a range of offences and enforcement powers. It provides a regulatory regime for pollution and waste management and also applies to pesticides. For example, fish kills caused by pesticide contaminants in waterways are generally investigated under the POEO Act.

Dangerous Goods (Road and Rail Transport) Act 2008 allows both EPA and SafeWork NSW to regulate the transport of dangerous goods (other than explosives) by road and rail as part of a national scheme for road transport. The transport of dangerous goods involves the importing, loading, consignment, marking and placarding of goods, and driving of vehicles. Because of their flammability, combustibility or toxicity, many pesticides are classified as dangerous goods.

Work Health and Safety Act 2011 and its Regulation 2011 cover the identification of hazardous substances (including most pesticides) in the workplace and the assessment and control of risks associated with their use.

NSW agencies

SafeWork NSW administers the State's work health and safety laws and provides information about using pesticides safely in the workplace.

NSW Ministry of Health, which advises on, and assesses, health-related pesticides incidents.

NSW Food Authority, under the *NSW Food Act 2003,* routinely monitors the results of pesticide and other chemical samples submitted by food companies to ensure compliance with the Australia and New Zealand Food Standards Code.

NSW Department of Primary Industries (DPI) administers the *Biosecurity Act 2015* and the *Local Land Services Act 2013*. The DPI and **Local Land Services** provide advice on the use of farm chemicals in agricultural production, including information on integrated pest management systems that can minimise the use of pesticides and other farm chemicals. Training and advice and overseeing the use of poisons for the control of feral pest animals are also provided through the DPI and Local Land Services.

Local government has planning, regulatory, management and monitoring roles relevant to pesticides. Local councils and some county councils are responsible for noxious weed control within local government areas and play an important role in zoning for appropriate adjacent land uses under local environmental plans and other planning mechanisms.

2.4 NSW Pesticides Regulation 2009

The Pesticides Regulation 2009 is made under section 119 of the *NSW Pesticides Act 1999*. Its provisions prescribe:

- **Licensing requirements** - for pest management technicians, fumigators, aerial application pilots and aerial applications businesses. It sets the fees for licence applications, details the particulars to accompany applications, prescribes the qualifications for the issuing of a licence and sets out particulars relating to records. Most of this content was added to the Regulation with the 2015 amendments.
- **Compulsory pesticide user training** - most users are expected to achieve specific national units of competency in chemical use at Australian Qualifications Framework Level 3. Separate training requirements apply for persons licensed under the Regulation. A small use exemption and an occasional supervised agricultural use exemption apply.
- **Record-keeping** – all people who use pesticides in their job or business are required to keep a record of their pesticide use. A small use exemption, similar to that for training, applies.
- **Notification of pesticide use by public authorities** - including NSW Government departments, local councils and county councils must give notice of their pesticide use in outdoor public places according to a publicly available notification plan.
- **Prior notice of pesticide use in residential complexes** - people who organise a professional pesticide treatment by a pest management technician in the common areas of multiple occupancy residential complexes need to advise residents prior to pesticide use in these areas.
- **Notice by pest management technicians and fumigators** - who apply pesticides in the common areas of multiple occupancy residential complexes need to give residents notice while they are using pesticides in these areas. Additionally, pest management technicians and fumigators must also notify those responsible for sensitive places when they propose to spray or inject liquid pesticides outdoors on an adjoining property.
- **Penalties** (including penalty notices for offences under the Pesticides Act) and fees for regulated activities.
- **Administrative provisions**, notably definitions.

3 Reason for regulating pesticides

The overall objective of the Regulation is to facilitate responsible use to reap the benefits that pesticides can provide, whilst managing the risks of pesticide use and avoiding adverse impacts on human health, the environment, property, industry and trade.

3.1 Benefits of pesticide use

Pesticides provide substantial benefits to the community and play an important role in supporting agriculture and other industries.

Production: Appropriate use of pesticides improves the yield and quality of food and fibre crops and the health and productivity of livestock.

Public health: Pesticide use has beneficial impacts on public health by preventing outbreaks of disease, such as bubonic plague through the control of rodent and diseases, or malaria from insect populations.

Other species: assistance in the control of environmentally harmful organisms and invasive species can, in turn, help protect native habitat and maintain biodiversity.

Property: destructive termite infestations can be controlled using pesticides, protecting private, public and commercial dwellings from structural damage.

Amenity: positive social, recreational and aesthetic outcomes can be achieved from the use of pesticides in recreation areas, such as sporting fields, golf courses, parks and water bodies.

3.2 Managing risks of pesticide use

The useful properties of pesticides can also be potential risks to human and environmental health if they are used inappropriately. The people at greatest risk are those who work with pesticides or who are regularly exposed to them.

Pesticides can have various adverse impacts on humans and the environment if they are used improperly or accidents happen. Potential adverse impacts of pesticide use include:

- illness or harm to humans who are exposed to pesticides (occupational and incidental)
- harm to non-target organisms (including native, ornamental and agricultural plants and animals) and the pollution of water and land, which can damage ecosystem function and reduce biodiversity increased pest resistance
- a reduction in trade as a result of agricultural produce exceeding maximum residue limits (MRLs) for pesticides or damage to non-target crops from incorrect application.

There are considerable risks and uncertainties associated with managing pesticides and what their exact impacts are on human health and the environment. While major pesticide incidents occur relatively infrequently, the risk of harm from an incident may be substantial.

3.3 Objectives of regulation

The primary objective in regulating pesticides is to reduce the externalities caused by inappropriate pesticide use, including adverse impacts on human health, the environment, property, industry and trade. These externalities result in a divergence between private and social returns resulting in a net economic cost to society. The Regulation aims to:

- reduce harm to people and the environment from misuse of pesticides by requiring a minimum level of training or a licence for higher risk activities
- ensure records are kept about pesticide applications for planning, quality control and enforcement purposes

- apply the principle that people have ‘the right to know’, allowing them to make informed decisions about their potential pesticide exposure.

The additional objectives of the changes introduced with the proposed Regulation are to:

- provide alternatives to the re-training requirement where continued best practice is demonstrable
- implement national harmonisation measures relating to standardised approaches to pesticide use record keeping, licensing of higher risk occupations and minimum competencies for users of higher risk chemicals
- phase in a cost recovery model for the pricing of licence fees, promoting economic efficiency through the more efficient allocation of resources and avoiding the inequality of allocating costs of regulating high risk users to taxpayers rather than to those deriving financial gain from high pesticide use.

4 Proposed Regulation and alternatives

The proposed Pesticides Regulation 2017 will carry forward the majority of provisions of the existing Regulation (outlined in Section 2.4) but will introduce changes to streamline record keeping and retraining requirements and to align licensing requirements with the Council of Australian Governments (COAG) agreed national harmonisation model.

Specifically, the remade Regulation will introduce the following changes:

- Licensing – new licence categories for pest management technician, fumigator and ground applicator businesses and ground applicator operators.
- Training – alternative options for maintaining user competency after initial training, either by retraining every five years or being a member of a recognised industry quality assurance scheme.
- Record keeping – simplified requirements for non-licensed pesticide users.
- Notification – including universities in the group of public authorities required to give notice according to a publicly available pesticides use notification plan.
- Penalties – updating penalty amounts to reflect movements in the consumer price index and to better reflect the nature of the offences.

The details of each option for the key changes to provisions in the proposed Regulation are outlined in the following sections. Each is compared to the alternative options of the base case (no regulation) and remaking the current Regulation (status quo) without the proposed changes. The costs and benefits of these options and related data and assumptions are discussed in Section 5.

The base case

This option would allow the Pesticides Regulation to lapse on 1 September 2017. There would therefore be no legislated requirement for those using pesticides in their job or business to undertake training or keep records relating to pesticide applications nor for higher risk users to hold a licence. Similarly, the provisions relating to the notification of pesticide use would no longer apply. With this option it is assumed that non-regulatory approaches would prevail where industry associations and bodies (representing pesticide users) encourage their members to undertake training in the correct use of pesticides, keep records of pesticide applications, and give notice of pesticide use in certain situations.

Status quo Regulation remake (option 1)

The option remakes the Regulation in its current form. None of the proposed updates to the Regulation would however be made.

The proposed Regulation (option 2)

This option remakes the Regulation, preserving the major provisions of the current Regulation as well as incorporating the streamlining, national harmonisation and other related updates outlined above.

4.1 Licensing

Licensing both individuals and businesses who intensively use pesticides on a for-service basis or for a public authority can help address the potential risks associated with pesticide use in a number of ways. Individual fee-for-service operators often work for a number of businesses under a range of employment or contractual relationships. Licensing allows verification that individuals have the necessary training in chemical use, provides traceability and aligns permission to provide chemical use services with responsibility for record keeping and for any chemical application errors. Licensing businesses recognises they may also be

legally accountable for errors, for ensuring chemical use records are kept and for implementing quality management systems.

Base case – no licensing requirements in NSW

Without legislation no pesticide users, regardless of risk, would obtain a licence. The community would no longer have the assurance that higher risk pesticide users (aerial applicators, pest management technicians, fumigators and ground applicators using powered equipment) are appropriately qualified nor subject to traceability by their clients and the EPA. The pest management industry would no longer be subject to the licence application and renewal process and the EPA would no longer have to administer a licensing scheme. Because the requirements of the NSW Pesticides Act and other environment protection would still apply, the EPA would likely work with the industry bodies on best practice initiatives to reduce the potential for pesticide misuse.

Option 1 – remake Regulation with current licensing categories

The current Regulation requires licensing of a sub-set of fee-for service pesticide users. This includes pest management technicians, commercial fumigators and aerial pesticide applicators (both conventional plane and remotely piloted aircraft (RPA)) and aerial pesticide (both conventional plane and RPA) businesses. These licences are valid for five years. The requirement to hold a licence also applies to persons working for public authorities and in the case of aerial pesticide application, any person performing aerial applicator work.

Option 2 – remake Regulation with revised national licensing categories

The full set of revised licence categories in the proposed Regulation are in line with the COAG-endorsed national harmonisation model[2]. The licensing model applies to most fee-for-service pest control providers (pest management technicians, fumigators, ground and aerial applicators), with the requirement to hold a licence applying to businesses and the individual pesticide applicators in those businesses. Businesses would be required to display their licence number on their work vehicles.

The additional licence categories that would be introduced with the proposed Regulation are summarised in Table 1 below – all of these will have a five year licence duration. As with existing licence categories the requirement to hold a licence for ground applicator work will also apply to public authorities. There will also be a new two year permit for pest management technician and fumigator trainees.

Table 1: revised licence categories introduced by the proposed legislation.

Existing licence categories	Additional licence categories with Option 2
Pest management technician work	Pest management technician business
Fumigation work	Fumigation business
Aerial applicator pilot work	Ground applicator work
Aerial applicator business	Ground applicator business
RPA applicator pilot work	Pest management technician or fumigator trainee permit
RPA applicator business	

[2] See A single national framework for the regulation of agricultural chemicals and veterinary medicines - regulatory model - Department of Agriculture and Water Resources and National Scheme for the assessment, registration and control-of-use of agricultural and veterinary chemicals – COAG Decision Regulation Impact Statement – Standing Council on Primary Industries | Regulation Impact Statement Updates

4.2 Training

Training is an important part of risk management as it ensures that users' qualifications and competency align with the risk associated with chemical use. That risk is dependent on the chemical product, the usage pattern and the environment in which it is used. Training users also minimises the possibility of inappropriate pesticide applications. Inappropriate pesticide applications include using too much pesticide, storing pesticides incorrectly, using pesticides around vulnerable people or not wearing the correct personal protective equipment.

Base case – no training requirements within NSW

Under the base case, many of those who use pesticides in their business would not undergo training in the responsible use of pesticides. Licensed pest management technicians, fumigators and ground applicators would also not be required to undertake any training to gain entry to the profession. Nevertheless, it is expected that training of some pesticide users would continue regardless, because of industry driven quality assurance programs, work health and safety considerations and for insurance due diligence purposes.

Option 1 – maintain the training requirements of the current Regulation

With this option the Regulation would be remade with no change to the current training requirements.

For most non-licenced occupational pesticide users, they would continue to be required to complete a nationally recognised vocational training course in safe pesticides use every five years, unless their pesticide use fell within the small use exemption or the occasional agricultural supervised use exemption.

The licenced pesticide users described in section 4.1 would have to obtain the specific units of competency and other qualification before they could be initially issued with their licence.

Option 2 – remake the Regulation with revised training requirements

The proposed Regulation will still require non-licenced occupational pesticide users to do initial training in safe pesticide use, but will provide two pathways for maintaining competency. Users that are participating in a recognised industry quality assurance (QA) scheme would not be required by the Regulation to undertake five-yearly retraining. The specific QA schemes that are to be recognised would be specified in an Order published in the NSW Government Gazette which could be updated as necessary. This change was committed to by the NSW Government in its 25 March 2015 Memorandum of Understanding with the NSW Farmers Association, *NSW Farming: Investing Locally, Connecting Globally*.

As is currently the case, most users will continue to be expected to attain the national chemical use competencies at level 3 from the Agriculture, Horticulture and Conservation (AHC) Training Package. However in line with the minimum training standards contained National Agvet Chemical harmonisation agreement, any person using pesticides that are Schedule 7 poisons must attain the level 3 competencies. Currently the notice of approved competencies issued under the Regulation allows lower literacy users who cannot achieve the level 3 chemical use competencies to achieve the level 2 work under supervision competency – this will no longer be available for using Schedule 7 pesticides because of the risks associated with such products, but will continue to be allowed for other pesticides. An amended notice of approved competencies will be gazetted once the proposed Regulation is remade.

With the proposed Regulation the EPA would continue to specify prescribed qualifications for users who wish to obtain a licence for prescribed pesticide work. The prescribed qualifications for licensees can be updated from time to time by a notice published in the Gazette. For the new licence category of ground sprayers, the competencies required will be the standard AHC Training Package level 3 chemical competencies required of unlicensed

occupational pesticide users. Licenced users are not required to complete re-training in order to renew their licences.

4.3 Record keeping

Keeping records of pesticide use helps to track the effectiveness of the pesticides used, provides vital information if incidents occur and, where an incident does occur, assists in ascertaining whether the pesticides were used responsibly. This is turn can help reduced health, trade and environment impacts if problems do occur.

Base case – no record keeping requirements within NSW

Under the base case, there would be no legislated requirement for any pesticide user (either industry or government) to keep records relating to pesticide applications. Nonetheless, because around half of non-licensed pesticide users are currently thought to keep records for other purposes such as quality assurance schemes and to assist good agricultural practice, it is expected that they would continue to do so in the absence of a Regulation but in a less detailed form than those currently required.

For pesticide users that are licensed under the current legislation it is expected that, without the Regulation, records would continue to be commonly kept as an adjunct to good business practice and that in many cases the current practice of providing a record of pesticide applications to the client with invoices would continue.

Option 1 – maintain the record keeping requirements of the current Regulation

Under the current Regulation there are requirements for licensed and non-licensed users to keep records of their pesticide use. The details of the records to be kept are the same for all uses other than aerial applications where some more details must be recorded.

In addition to records kept of pesticide applications, there are also record keeping requirements applying to trainees and supervisors. Trainees are required to keep a daily record of their work activities and have this verified by their supervisor.

Option 2 – implement revised record keeping requirement

Under the proposed Regulation, all applications, including agricultural and commercial pesticide treatments and local and state government applications would need to be recorded. However the provisions of the proposed Regulation simplify record keeping for non-licensed pesticide users, in line with the COAG-endorsed national harmonisation model. Non-licensed users would no longer have to record details such as start and finish times, the order in which area of the property was being treated and the equipment used to apply the pesticides, unless such information was explicitly required to be recorded by the approved instructions on the product label of permit.

There would be no changes to the current obligations for trainees and their supervisors with regards to keeping, and reviewing, of records of their work while they are a trainee.

4.4 Notification

Notification in NSW is based on the principle of ‘right to know’. It allows people to have access to information about pesticide use in public places, where they live and close to sensitive places so that people can make informed decisions about their exposure to pesticides. This in turn allows people to avoid the chance of exposure if they wish, but does not grant them the right to veto that pesticide use.

Base case – no notification requirements within NSW

Under the base case, there would be no legislated requirement for:

- pest management technicians and administrators of multiple occupancy dwellings to notify residents of pesticide treatments on common property
- pesticide operators to notify sensitive places of adjacent pesticide treatments
- public authorities to provide notification of the public of pesticide use in outdoor public places.

Nonetheless, community expectations would be likely to result in around a proportion of government bodies (both state and local) continuing to notify the public of their pesticide use in public places. Prior to notification requirements being introduced by the Regulation in 2007 approximately 40% of public authorities consulted by the EPA advise they were providing some level of notification of their pesticide use.

Similarly it is likely that some degree of notice of pesticide use in the common areas of multi-residence complexes would be provided in the interests of keeping residents appropriately informed and because for some pesticide products the instructions on the label require public access to be restricted for a period of time after application.

Option 1 – remake Regulation with current notification provisions

Under the current Regulation persons organising pesticide treatments by pest management technicians and fumigators of the common areas of multiple occupancy residential dwellings must ensure that residents are provided with at least five working days prior notice. Pest management technicians and fumigators must provide notice of their pesticide use in the common areas while the job is being undertaken and provide persons with a copy of the safety data sheet if so requested.

Pest management technicians are also required to provide notification to sensitive places of certain outdoor pesticide treatments when they are working on adjoining properties.

Under the current Regulation, public authorities (including local councils in NSW and state government agencies such as National Parks and Wildlife Service, NSW Trains, Roads and Maritime, State Forests), are required to have in place a publicly available *pesticide use notification plan* if they use pesticides in outdoor public places. Authorities must also provide notice in accordance with the commitments described in that notification plan.

Option 2 – update provisions to include universities

Under the proposed Regulation the requirements to notify residents of pesticide use by pest management technicians and fumigators in multi-occupancy residential complexes will remain the same, as would the requirements for to provide neighbour notification to sensitive places.

The current requirements for public authorities to have in place a pesticide use notification plan would also remain the same, including retaining the requirement for major privatised utility undertakings to continue to give notice in accordance with a pesticides use notification plan. However with the proposed Regulation universities constituted in NSW would be included in the definition of public authority, requiring them to newly prepare and follow a pesticide use notification plan where this has not already been done on a voluntary basis.

4.5 Penalties

Base case – no penalty infringement notice offences for pesticide offences

In the base case, there would no longer be penalty infringement notice (PIN) offences defined for misuse offences committed under the Pesticides Act, such as causing off target harm, not following the approved label or using unregistered pesticides. Consequently the EPA could only pursue enforcement action by court prosecution.

All offences defined under the current Regulation, such as aerial applicators not providing farmers with records of pesticide treatments, using unqualified or unlicensed staff to apply pesticides, and reporting false or misleading information in voluntary pesticide treatment records would no longer attract a penalty.

Option 1 – maintain the Regulation's current penalty infringement notice provisions

With this option the PIN offences specified for both offences under the Pesticides Act and for Offences defined in the current Regulation would be retained in their current form and at their current levels. There would be no updating of penalty levels to reflect movements in the consumer price index (CPI) and no review of the relative amounts of penalties in the light of the EPA's enforcement experience.

Option 2 – update the Regulation's penalty infringement notice provisions

The penalty quanta in the current Regulation were initially set between 2001 and 2007 and have remained mostly unchanged since that time. In the proposed Regulation penalties for offences other than those that deal with misuse (e.g. failure to comply with record keeping, training obligations) will be updated only to the extent necessary to take account of movements in the CPI since the original amounts were set. Accordingly PIN amounts that are currently $100 would be increased to $125; those that are currently $200 would be increased to $250; those that are currently $400 would be increased to $500; those that are currently $800 would be increased to $1000.

In addition, penalties for pesticides misuse and related offences would be increased to the highest amount available under the Act – $750 for individuals and $1500 for corporations. Enforcement experience in recent years has shown that the current levels do not match the potential gravity of these offences (e.g. causing off-target harm to persons, animals, plants and property) and they are now notably lower than most PINs under the other Environment Protection Legislation.

4.6 Licence fees

Base case – no licence fees

In the base case there would be no licences and accordingly no mechanism for charging fees. This would remove the EPA's ability to recover the costs of compliance activities which address the higher risks associated with pesticide applications by aerial applicators, pest management technicians, fumigators and ground applicators.

Option 1 – maintain the current Regulation's below-cost recovery fees

The current licence fee levels were established before the EPA took over the licensing of pest management technicians and fumigators from the former NSW WorkCover Authority, which occurred when legislative changes came into effect on 1 September 2015. Although fees have been indexed at 2.5% per annum (to cover public sector wage increases) since the licence transfer occurred, the current specified levels from 1 July 2017 of $196 for new applications and $153 for renewals for a five year licence do not cover the costs of licence administration and the compliance costs that are directly attributable to auditing these licensees. Maintaining current fee levels with the remade Regulation would mean that there would be an ongoing funding shortfall which over time would constrain the resources the EPA can direct toward auditing and ensuring legislative compliance, in turn increasing the risk that inappropriate pesticide use practices may occur.

Option 2 – phase in cost recovery-based fees

The fee levels in the proposed Regulation which apply to five year licences are based on a phased approach that will attain cost recovery by year three. After that the fees will only be

increased by 2.5% per annum to cover expected wage increases. The proposed fee levels are summarised in Table 2 below.

Table 2: proposed Regulation fees for five-year licences and two-year trainee permits

	Period 1 (1/9/17–30/6/18)	**Period 2** (2018–19)	**Period 3** (2019–20)	**Period 4** (2020–21)	**Period 5** (2021–22)	**Period 6** (2022–23)
Application fee (5 year)	$ 196.00	$ 295.00	$ 395.00	$ 405.00	$ 415.00	$ 425.00
Renewal (5 year)	$ 196.00	$ 295.00	$ 395.00	$ 405.00	$ 415.00	$ 425.00
Trainee Permit (2 year)	$ 78.40	$ 118.00	$ 158.00	$ 162.00	$ 166.00	$ 170.00

Introducing these fee levels with the proposed Regulation would provide sufficient funding of staff resources to ensure the EPA can direct an efficient risk-based auditing and legislative compliance program towards licensees, in turn reducing the risk that inappropriate pesticide use practices may occur. This would provide for licenced businesses to be audited on average only approximately every nine years, but an efficient risk-based approach would be applied that allowed effort to be directed where there was the greatest likelihood of non-compliance with the legislation or highest potential consequences from pesticides misuse. For administrative simplicity fees for renewals and new applications have been aligned as analysis has shown only a marginal difference in administration costs.

Section 5.5 provides a detailed cost recovery analysis of the proposed licence fees.

4.7 Other provisions

The proposed Regulation also includes other miscellaneous provisions of an administrative nature, namely:

- For the purposes of those parts of the Pesticides Act that allows Government action on produce affected by high levels of pesticide residues, it clarifies what is meant by the terms ‘agricultural produce’ and ‘prescribed substances’, linking these to the definitions and numerical criteria in the national Maximum Residue Level Standard and the Food Standards Code.
- It clarifies the circumstances under which a pesticide may be used on a plant or crop for a pest other than that specified on the product label.
- It specifies the prescribed fees the EPA may charge for notices issued under sections 22(2) and 27(2) of the Pesticides Act.
- Contains saving provisions for when the Pesticides Regulation 2009 is repealed.

These provisions are not considered to be significant in their regulatory impact so are not assessed further. However they are outlined here as their absence in the base case would create increased ambiguity among the regulated community in the administration of the Pesticides Act by leaving the matters they address to be handled administratively by the EPA.

5 Incremental benefits and costs of the proposed Regulation

The EPA commissioned Gillespie Economics to undertake a cost benefit analysis (CBA) of the options outlined in Section 4 of the RIS. For estimates of present value and net present value a standard discount rate of 7% has generally been applied unless stated otherwise.

Analysis of the incremental costs and benefits of the proposed regulation and alternative option is conducted against the base case, which provides the benchmark against which all alternatives are compared over time.

5.1 Incremental costs

5.1.1 Licensing

Under the base case there would be no requirement for high risk users or trainees to hold a licence. Consequently, there would be no costs to industry associated with completing the application process and no costs to government of administering the scheme.

With the proposed Regulation, high risk users and trainees would be required to hold a licence. Full licences are required to be renewed every five years and trainee permits will be valid for two years. There are currently approximately 6000 licences issued. It is assumed that over the life of the Regulation renewals would be evenly spread and that additional licence applications would grow at 2% each year. In addition, approximately 1600 pest management technician and fumigator business, ground applicators and ground applicator businesses (who have previously never been licenced under the Regulation) would be required to obtain a five-year licence at the commencement of the Regulation. Growth in these stakeholders is also assumed at 2% per annum. There would also be an initial 860 trainees seeking a trainee permit with subsequent annual growth in permits of 2% per annum. Costs associated with licensing include a time cost of filling in the application incurred by the applicant (assumed to be 10 minutes of administration time per application) and a cost of processing to EPA (assumed at an average of 20 minutes per application for a Grade 3 Environment Officer).

5.1.2 User training

Under the base case, while there would be no legislated requirement for any pesticide user to undertake training it is still expected that training of some pesticide users would continue regardless. Data available from before the user-training provisions were introduced in 2003 indicate that 6000 people who use pesticides in their business, for example in farming, were on average undertaking voluntary pesticide training each year. It is assumed that in the absence of a Regulation, these users (out of an estimated 75,000 non-licenced pesticide users in total and 16,500 requiring training in 2017–18) would continue to undergo training in the correct preparation and application of pesticides. We estimate 2.7% of these to be Government users with the remainder from industry, that is, the agriculture sector, golf courses, bowling clubs, and landscape gardening services[3]. In addition, it is assumed that 30% of people becoming pest management technicians, fumigators and ground applicators would voluntarily undertake some entry training.

It is assumed that these people would use currently available one day training courses, face-to-face or online[4], and incur direct travel costs[5] and time costs for travel to face-to-face

[3] In proportion to the population of pesticide users.

[4] It is assumed that 60% undertaken the course face-to-face with the remainder doing it online. ChemCert advised that most still do it face-to-face.

[5] Average 2 hours return travel at 40km hour and variable vehicle costs of $0.17/km.

courses[6], time costs during participation in the courses[7] and fees associated with participation in the course[89].

The proposed Regulation requires all non-licenced occupational pesticide users (other than domestic users) to be trained every five years, except where users are participating in a recognised industry quality assurance (QA) scheme. The number of pesticide users is assumed to grow at approximately 2% pa. It is assumed that existing agricultural QA schemes become accredited over the life of the Regulation and in the final year of the proposed Regulation 30% of agricultural users that would have otherwise required retraining do not due to existing participation in QA schemes[10].

Consistent with the base case assumptions[11], it is assumed that people requiring training would use currently available one day training courses face-to-face or online, and incur direct travel costs and time costs for travel to face-to-face courses, time costs during participation in the courses and fees associated with participation in the course[12]. Approximately 2.7% of those who use pesticides in their job are employed by local and state government agencies and are required to undergo training.

5.1.3 Record keeping

Under the base case, with no legislated requirement to keep records relating to pesticide applications[13] it is assumed that around 50% of unlicensed pesticide users currently keep records for other purposes and would continue to do so in the absence of a Regulation[14] but in less detailed form than those required under the existing Regulation[15]. For licensed pesticide users it is assumed that records would be kept for 70% of the 3.5 million applications per annum[16] and that a record of these applications would be provided to the client[17].

Under the proposed Regulation, all applications of pesticides, including agricultural and commercial pesticide treatments and local and state government applications, would need to be documented via official record keeping practices. Relative to the base case, the 50% of unlicensed pesticide users (agricultural, commercial and government users) who do not keep records would be required to keep records[18] and the 50% who already keep records would incur additional time costs[19] as more extensive records are kept. The 30% of currently licensed pesticide users, (plus 100% of newly licensed ground applicators who kept no records under the base case would incur costs of keeping records[20] and providing records to clients[21]. The opportunity cost of time was based on average hourly earnings of the NSW workforce.

[6] 2 hours return travel with opportunity cost of 35% of average wage i.e. assumes that travel time displaces leisure time.
[7] 10 hours for all students apart from repeat face-to-face students where time is 8 hours - opportunity cost of time for face to face students is assumed to be the average wage rate i.e. participation time replaces work time, while for online studies it is 35% of the average wage i.e. participation time displaces leisure time, as these people are assumed to have flexibility to undertake course when opportunity cost is lowest
[8] $350 for initial students face-to-face and all students online and $275 for reaccreditation face-to-face.
[9] For simplicity it is assumed that the fees paid by users of training courses are on a cost recovery basis.
[10] It is assumed that this level of people are already in the QA schemes but the QA schemes take time to be accredited i.e. the costs of joining any QA are not included since it is assumed pesticide users are already in these schemes.
[11] Assumptions are the same as for the base case but applied to a greater number of trainees i.e. around 16,500 per annum.
[12] For simplicity it is assumed that the fees paid by users of training courses are on a cost recovery basis.
[13] There are estimated to be 570,000 pesticide applications per year with 30% of these by government.
[14] Discussion with industry and government sources suggests that the proportion of records kept irrespective of requirements under the Regulation is approximately 50%. Pesticide records are required by large supermarkets such as Coles and Woolworths; for various occupational health and safety requirements; under licence conditions for commercial pest management technicians and aerial applicators; and for participation in trade with some countries (e.g. Japan).
[15] 2 minutes per application instead of 5 minutes.
[16] 7 minutes per application.
[17] Assuming 1 minute per application to provide this information.
[18] 5 minutes per application.
[19] Additional 3 minutes per application.
[20] 5 minutes per application.
[21] 1 minute per application.

5.1.4 Obligations for trainees and supervisors

Under the base case, it is assumed that normal supervision of pest management technician and fumigator trainees occurs but trainees do not keep any records of their on the job training.

Under the proposed Regulation, it is assumed that normal supervision of trainees continues but trainees keep a daily record of their work activities at a time cost of five minutes per day and supervisors of trainees spend one minute per day checking the trainees' record. The opportunity cost of time is at the average wage rate of technicians and trainees (including on-costs).

5.1.5 Notification

Under the base case, there would be no legislated requirement for any form of notification of pesticide use. However, community expectations are likely to result in around 40% of government bodies (both state and local) continuing to notify the public of their pesticide use in public places. These costs are associated with registering a schedule of pesticide treatments on the public authority's website[22], erecting signs on site[23] and discussing with residents who register a concern,[24] and relate to the opportunity cost of time[25].

Under the proposed Regulation pest management technicians and fumigators would be required to notify residents in multiple occupancy dwellings of pesticide treatments[26]. Costs arise from preparing notification materials, advising building managers of the legislated requirements[27] and confirming notification upon arrival at a job[28].

Costs would also be incurred by strata or building managers from discussions with pest management technicians and fumigators[29] and providing notification to residents[30].

Pest management technicians would also be required to provide notification to sensitive places of adjoining outdoor pesticide treatments[31]. Costs to pest management technicians are associated with determining if applications will be near a sensitive place[32], notifying sensitive places[33] and undertaking further discussions with concerned people[34]. There are also costs to sensitive places associated with undertaking discussions with pest management technicians[35] and informing staff/clients[36]. Time costs are based on average wage costs.

Under the proposed Regulation all public authorities, now including 11 universities, would also incur costs from the notification of all pesticide treatments in public places (not just for 40% of treatments assumed under the base case) in accordance with their pesticide use notification plan. Unit time and costs assumptions are as per the base case.

5.1.6 Compliance activities

In the absence of a Regulation, the EPA would continue to incur some administration and compliance costs in relation to provisions under the *Pesticides Act 1999*. This would include

[22] 2 days per annum per agency.
[23] 5 mins per job.
[24] 10 minutes for the 1% jobs where residents register concern.
[25] Typical salary for Council and Government agencies were assumed.
[26] 53,000 multiple occupancy residencies undertaking 1 spray per annum.
[27] 5 minutes.
[28] 5 minutes.
[29] 5 minutes.
[30] 15 minutes.
[31] 5550 notifications per annum.
[32] 1 minute if repeat client (75%) and 3 to 5 if new client (25%) and 3 minutes to inspect before commencing spray for new clients.
[33] 5 minutes.
[34] 5 minutes for the 10% requiring discussion.
[35] 5 minutes for the 5% requiring discussion.
[36] 3 minutes per notification.

industry audits and inspections which currently have an estimated cost of $380,000 per annum. This activity would take place in the context of no licensing, limited voluntary record keeping and no training of pesticide users.

With the Regulation there may be some cost savings, relative to the base case, associated with administration and compliance. Auditing activities would be more efficient as it would be easier to ascertain the competence of pesticide users via reference to their training status and records. However, compliance auditing would be associated with checking the additional requirements of the Regulation in relation to training, record keeping, licensing and notification. Consequently, for the purpose of the analysis has been assumed that the net effect of the Regulation for administration and compliance costs to the EPA is zero.

Currently the EPA receives an average of 270 pesticide incident-related calls through Environment Line each year. The exact impact of removing the provisions of the Regulation could not be quantified. It is, nonetheless, assumed that regulation plays a significant role in reducing the number of complaints relating to misuse, ground and aerial overspray, and water pollution. Without a Regulation the number of complaints relating to provisions of the Regulation (such as training, notification and licensing) would be reduced to zero. Calls in these categories make up less than 0.1% of pesticide related calls, so the impact is considered insignificant. Complaints arising from misuse attributable to lack of training in correct pesticide use would however be likely to increase.

5.1.7 Change of behaviour for sensitive places and the community

The notification provisions implement the principle of 'community right to know' by helping people reduce their potential exposure to pesticides. To the extent that people are unable to undertake activities, need to postpone activities or alter their behaviour as a result of these notifications, there may be a cost to the community. However, advanced notification and the ability of the community to substitute one activity for another is likely to result in minimal economic costs.

5.2 Cost recovery for licence fees

Under the proposed Regulation, the EPA would continue to be responsible for implementing licensing of high risk users including some additional licence categories. The EPA incurs costs associated with processing licence applications and compliance activities in relation to these licensees.

It is expected that 5368[37] currently licensed high risk users will renew their licence every five years. Assuming renewal is spread across the five year period, each year 1074 require renewal. 1600 pest management and fumigator business, ground applicators and ground applicator businesses (who have previously never been licenced under the Regulation) would require licences in the initial year of the Regulation. A further 860 existing trainee pest management technicians and fumigators would also require licensing in the first year of the Regulation. It is assumed that there is growth in those requiring licences of 2% per annum.

At an estimated time cost of 20 minutes, the estimate cost to EPA of processing high risk users and trainee pest management technicians and fumigators is $15.

EPA analysis has determined that the minimum level of efficient risk-based industry compliance auditing for the increased number of licensees would cost $515,000 per annum. Recouping this compliance cost via licence applicants each year amounts to $370 each. In total, the cost recovery charge for licensees including licence administration costs is estimated at $385 per application in 2017 dollars. The current total compliance cost for licensees is estimated at $313,000 per annum in 2017.

37 This estimate takes into account current licensees that are expected not to be renewing their licences.

The cost recovery charge for licensees would be indexed in line with wage growth (2.5% per annum) over the life of the Regulation.

Costs of compliance activities associated with non-licensed pesticide users are not able to be recovered.

5.3 Summary of incremental costs

Costs of the proposed Regulation, relative to the base case of no regulation, are summarised in Table 3.

Table 3: Costs of the proposed Regulation relative to the base case (present value at 7% discount rate)

Stakeholder Group	Costs	Base Case	Option 2	Incremental
Industry: Technicians, Multi-unit developments (MUD) managers and sensitive place managers	Licensing	$0	$50,587	$50,587
	User training	$18,622,894	$48,295,221	$29,672,327
	Record keeping	$53,251,689	$82,598,354	$29,346,665
	Obligations re trainees and supervisors	$0	$3,801,103	$3,801,103
	Notification MUD	$0	$6,030,741	$6,030,741
	Notification Sensitive Places	$0	$110,567	$110,567
	Sub-total	**$71,874,583**	**$140,886,572**	**$69,011,989**
Sensitive places	Notification Sensitive Places	$0	$64,467	$64,467
	Sub-total	**$0**	**$64,467**	**$64,467**
State Government and Councils	Licensing	$0	$116,826	$116,826
	User training	$628,848	$1,747,892	$1,119,044
	Record keeping	$597,782	$2,988,911	$2,391,129
	Notification public places	$957,818	$2,432,952	$1,475,134
	Compliance Monitoring	$1,552,244	$2,382,423	$830,179
	Sub-total	**$3,736,693**	**$9,669,004**	**$5,932,311**
All Stakeholders	**Total**	**$75,611,275**	**$150,620,044**	**$75,008,769**

Costs relative to Option 1

The costs of the Regulation relative to Option1, that is a status quo remake of the Regulation with no changes to licensing, user training and record keeping, are summarised in Table 4. Compared to this option the proposed Regulation is associated with higher licensing costs for industry and Government but lower user training and record keeping costs.

Table 4: Costs of the proposed Regulation Relative to Option 1 (present value at 7% discount rate)

Stakeholder Group	Costs	Option 1	Option 2	Incremental
Industry: Technicians, multi-unit developments managers and sensitive place managers	Licensing	$31,830	$50,587	$18,757
	User training	$52,787,675	$48,295,221	($4,492,454)
	Record keeping	$85,359,340	$82,598,354	($2,760,986)
	Sub-total	**$138,178,844**	**$130,944,162**	**($7,234,683)**
State Government and Councils	Licensing	$73,507	$116,826	$43,318
	Record keeping	$4,184,475	$1,747,892	($2,436,583)
	Sub-total	**$4,257,983**	**$1,864,718**	**($2,393,265)**
All Stakeholders	**Total**	**$142,436,827**	**$132,808,879**	($9,627,948)

5.4 Incremental benefits of the proposed Regulation

5.4.1 More efficient pesticide use

Reduced costs

A benefit to industry of the proposed Regulation is that agricultural landholders will have access to records for all pesticide treatments, enabling a comparison of the quantity of pesticides applied with the final quality and quantity of produce. This assists landholders to optimise expenditure on pesticide treatments by avoiding unnecessary purchases and applications and better determine future pesticide treatment needs. Training of pesticide users also ensures efficient pesticide use and reduced wastage through the correct calibration of equipment, reduced spray-drift and use of the correct dosages.

ABS (2017) reports total agricultural expenditure in NSW in 2006–07 on herbicides ($279 million) and pesticides/insecticides ($132 million) amounts to $411 million in total. Assuming 30% of total pesticide use in NSW is by pest management technicians (consistent with 2009 Pesticide Regulation RIS) the total value of pesticide use in NSW is in the order of $587 million per annum.

As an indication of the possible cost savings from more efficient pesticide use in NSW, a 1% reduction in pesticide use could result in an incremental annual cost saving of $2.7 million to NSW farmers and $1.2 million to NSW pest management technicians, per annum.[38] This represents an additional cost saving of $15.9 million present value over five years compared with the base case.

Improved production

As well as a reduction in pesticide costs, optimisation of pesticide treatments as part of an Integrated Pest Management (IPM) program, has been shown in overseas trials to improve yields (Pretty 2005). In NSW crop production in 2014–15 was valued at $6.3 billion. Even a small gain in output as a result of pesticide optimisation due to the regulation e.g. 0.05%, would result in benefits of $2 million each year,[39] and present value of $9 million.

5.4.2 Reduced risk to trade of produce

By ensuring that users of pesticides are adequately trained, records of pesticide treatments are kept and a compliance framework is maintained, the proposed Regulation is expected to reduce the risks of fresh produce exceeding Maximum Residual Limits of pesticide, thereby

[38] This is prorated based on levels of training and record keeping under the regulation relative to the base case.
[39] This is prorated based on levels of training and record keeping under the regulation relative to the base case.

reducing the potential for trade and domestic impacts on the agricultural industry. These provisions also reduce the risk of spray drift affecting other user's crops, likely reducing claims and premiums for harvest protection insurance. Because local data on these issues is not publicly available, this benefit remains unquantified in this analysis.

5.4.3 Avoided health costs – mortality and morbidity

A benefit of the Regulation relates to the reduced incidence of morbidity and mortality impacts from inappropriate use of chemicals.

Over the 19 years between 1997 and 2015, 19 people died in NSW from accidental poisoning through pesticide exposure: one person per year on average (ABS 2006; ABS 2016). The proposed Regulation will help prevent unnecessary deaths from pesticide poisoning. It is assumed with the Regulation there will continue to be on average one death per year from accidental pesticide poisoning but without the Regulation there will be one more death every two years compared with the base case.

Since 1998, there has been a downward trend in the number of national hospital admissions due to the poisoning and toxic effects of pesticides (see Figure 1), with stabilisation at around 272 admissions each year between 2007–08 to 2013–14. NSW admission has also had a downward trend between 1996–97 and 2006–07. More recent data is unavailable and with the proposed Regulation it is assumed that accidental pesticide hospitalisations stabilise. Without the Regulation it is assumed that they gradually increase, reversing the trend between 2007-08 to 2013–14.

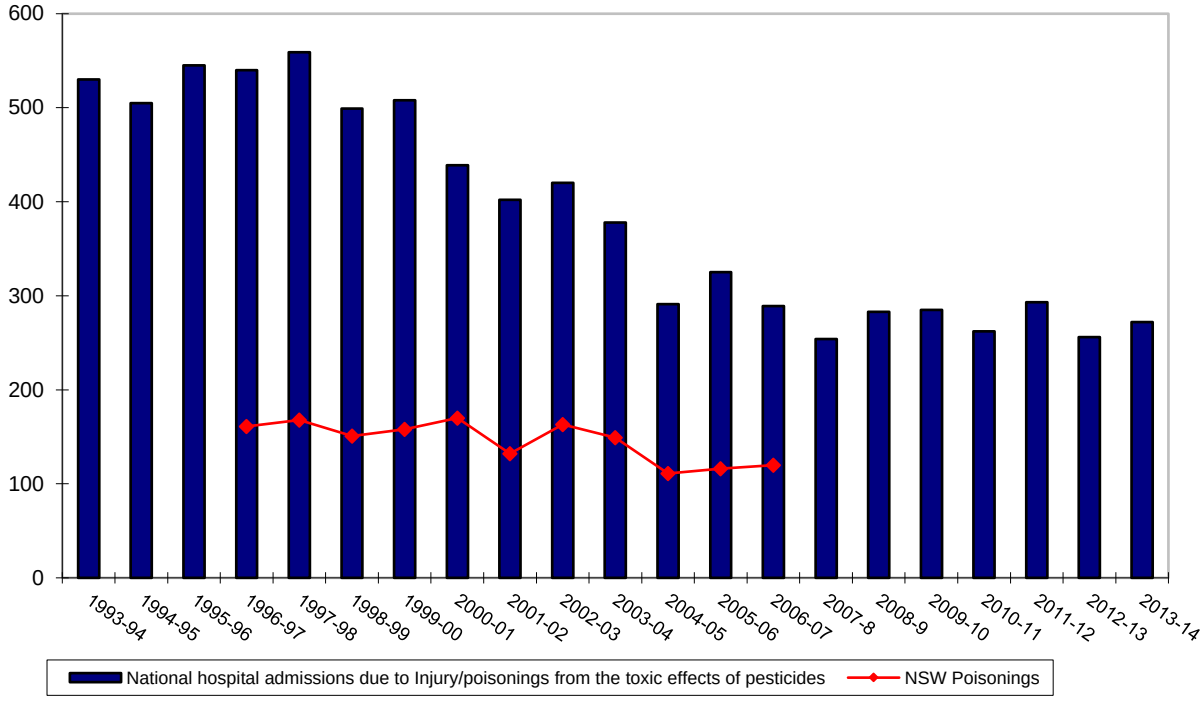
In addition, it is expected that the Regulation would result in a reduction in non-hospitalised acute pesticide poisonings. However, data in NSW on less severe incidences are absent. Calvert et al (2008) in perhaps the only detailed study of both hospitalised and non-hospitalised acute pesticide poisoning among agricultural workers, found that in the USA the majority (87%) of pesticide incidences were of low severity (resolved without treatment – eye, skin and or upper respiratory irritation) and requiring less than three days of lost work.

In this analysis of the proposed Regulation, the same ratio of low severity incidences to hospitalisations reported by Calvert et al (2008) is assumed, with low severity incidences requiring 0.5 days of lost work.

For the purpose of the analysis, the value of a statistical life (VOSL) and value of a life year (VOLY) is assumed to be $6,698,897 and $325,434, respectively (in 2016 dollars) (NSW Transport, 2013). A disability weight of 0.608 is applied to VOLY to adjust a life year for pesticide poisoning in accordance with Australian Safety and Compensation Council (2008). Valuation of morbidity and mortality are conservative since they do not account for any lingering impacts following hospitalisation and milder incidences. These can include the development of cancer, neurological effects, and adverse effects on the respiratory and reproductive systems.

Based on these assumptions, the proposed Regulation would result in avoided health costs compared with the base case of $14.0 million present value over the five years of the analysis.

Figure 1: Annual hospital admissions due to pesticide poisoning



5.4.4 Avoided environmental damage

Pesticides can contaminate soil, water, turf, and other vegetation. In addition to killing insects or weeds, pesticides can be toxic to a host of other organisms including birds, fish, beneficial insects (including bees) and non-target plants (Aktar et al 2009).

The user-training requirements under the proposed Regulation help ensure that all pesticide users can identify potential environmental hazards associated with the use and disposal of chemicals. Despite other NSW legislation that prohibits pollution from chemicals, the user training requirement under the proposed Regulation can directly reduce both the risk and the severity of potential environmental incidents.

The potential magnitude of environmental benefits of the proposed Regulation can be inferred from Pimentel (2003) who estimated that in the USA there is $10 billion dollars per annum in environmental and societal damages from the application of pesticides in Agriculture, with non-public health costs being 7.5 times those of public health costs. Refer to Table 5. Excluding crop losses (which are addressed separately above) environmental costs are 6.2 times those of public health costs.

Table 5: Total estimated environmental and social costs from pesticide in the United States

Costs	**United States domestic market (USDM) per year**
Public health costs	1,140
Domestic animal deaths and contaminations	30
Loss of natural enemies	520
Cost of pesticide resistance	1,500
Honey bee and pollination losses	334
Crop losses	1,391
Fishery losses	100
Bird Losses	2,160
Groundwater contamination	2,000
Government regulation to prevent damage	470
Total	**9,645**

Source: Pimentel (2003) p. 248

Assuming that the environmental benefits of the proposed Regulation reflect the proportions found by Pimentel (2003) environmental benefits of the Regulation may be in the order of 6.2 times those of the estimated public health benefits i.e. in the order of $21 million per annum.

5.5 Results of cost benefit analysis

Table 6 shows the present value of incremental costs and benefits of the proposed Regulation over five years.

Table 6: Incremental costs and benefits of the proposed regulation

Incremental impact **Stakeholder group**	**Costs**	**4%**	**7%**	**10%**
Industry: Technicians, multi-unit development managers and pesticide users	Licencing	$53,940	$50,587	$47,604
	User training	$32,082,499	$29,672,327	$27,543,976
	Record keeping	$31,863,377	$29,346,665	$27,132,095
	Obligations re trainees and supervisors	$4,131,717	$3,801,103	$3,510,442
	Notification MUD	$6,547,925	$6,030,741	$5,575,647
	Notification Sensitive Places	$120,049	$110,567	$102,224
	Sub-total	**$74,799,507**	**$69,011,989**	**$63,911,988**
Sensitive places	Notification Sensitive Places	$69,996	$64,467	$59,602
	Sub-total	**$69,996**	**$64,467**	**$59,602**
State Government and Councils	Licencing	$124,569	$116,826	$109,936
	User training	$1,216,110	$1,119,044	$1,033,696
	Record keeping	$2,596,187	$2,391,129	$2,210,688
	Notification public places	$1,601,639	$1,475,134	$1,363,817
	Compliance Monitoring	$901,373	$830,179	$767,531
	Sub-total	**$6,439,878**	**$5,932,311**	**$5,485,669**
	Total	**$81,309,381**	**$75,008,767**	**$69,457,258**
Stakeholder Group	**Benefits**			
Industry and Government	Pesticide cost savings	$17,239,566	$15,877,908	$14,679,723
	Increased agricultural productivity	$9,485,605	$8,736,390	$8,077,121
Community	Avoided health costs	$15,286,127	$14,070,679	$13,001,644
	Morbidity	$374,977	$337,279	$304,598
	Mortality	$14,911,150	$13,733,400	$12,697,045
Community	Avoided environmental costs	$94,462,374	$86,976,099	$80,390,120
	Total	**$136,473,672**	**$125,661,076**	**$116,148,608**
	Net benefit	**$55,164,291**	**$50,652,308**	**$46,691,349**
	Benefit Cost Ratio	**1.7**	**1.7**	**1.7**

Based on the above estimates, the proposed Regulation would have incremental net benefits to NSW of $51 million present value (at 7% discount rate) and a benefit cost ratio of 1.7. The Regulation would therefore be desirable from an economic efficiency perspective.

6 Conclusion

The results in Section 5 of the cost-benefit analysis show that the proposed Regulation would have incremental net benefits to NSW of $51 million present value and a benefit cost ratio of 1.7. These benefits accrue from a range of legislated provisions including nationally harmonised licensing categories, mandatory user training (with options for retraining), streamlined record keeping and notification of pesticide use.

There are also some benefits which cannot be readily quantified. For instance, there have been no Australian studies to value the damage from pesticides on the natural environment. Similarly, there is limited quantitative data on the extent to which responsible pesticide management would reduce these costs.

Nonetheless, quantifiable benefits from making the proposed Regulation can be identified in terms of pesticide application cost savings, increased agricultural productivity, avoided health costs and avoided environmental costs, leading to the conclusion that the quantifiable benefits of remaking the Regulation exceed the costs it imposes by a substantial margin. Compared with the base case, the proposed Regulation will ensure that significantly more users will manage pesticides appropriately through adequate user training, licensing of higher risk pesticide users, notification and record-keeping.

As the proposed Regulation secures more benefits for the community and is likely to provide a net benefit to society, it is the preferred option for replacing the current Regulation when it is due for repeal on 1 September 2017.

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WorkCover NSW 2006b, *Safe use of pesticides including herbicides in non-agricultural workplaces*, available at http://www.safework.nsw.gov.au/__data/assets/pdf_file/0005/52871/Safe-use-of-pesticides-in-non-agricultural-workplaces-Code-of-practice.pdf

Appendix A - Better Regulation Principles

The *Guide to better regulation* (NSW Government 2016) requires new Regulations that are judged to be significant to have their associated regulatory impact statements address the better regulation principles set out in the guide. These principles have been applied throughout this analysis. The compliance with better regulation principles in the RIS is set out in the following table.

Better regulation principle	Pesticide issue	Compliance under the RIS
Principle 1: The need for government action should be established	Pesticides are inherently risky substances. Regulation is required to facilitate their correct use and avoid a divergence between private gains and cost to society.	Sections 3 and 4
Principle 2: The objective of Government action should be clear	The primary objective in regulating pesticides is to reduce the externalities caused by inappropriate pesticide use, including adverse impacts on human health, the environment, property, industry and trade.	Section 3.3
Principle 3: The impact of government action should be properly understood by considering the costs and benefits of a range of options, including non-regulatory options	A range of other options, including self-regulation and keeping the current Regulation unchanged.	Section 4 and Section 5
Principle 4: Government action should be effective and proportional	National review of the regulation of pesticides has identified areas for streamlining and harmonising. These are implemented in the proposed Regulation.	Section 4 and Section 5
Principle 5: Consultation with business and the community should inform regulatory development	The EPA undertook preliminary consultation with key stakeholders prior to the development of the proposed Regulation. The National Scheme for Assessment, Registration and Control-of-use of Agricultural and Veterinary Chemicals has also been developed in consultation with community and industry.	Section 1.2
Principle 6: The simplification, repeal, reform or consolidation of existing regulations should be considered	Allowing the Regulation to lapse was considered under the base case. This action would not adequately safeguard human health and the environment from inappropriate pesticide use.	Section 4 and Section 5
Principle 7: Regulation should be periodically reviewed, and if necessary, reformed to ensure its continued efficiency and effectiveness	The Regulation is subject to a continuous process of review as part of enforcement.	

Appendix B – Distribution of costs and benefits

Cost benefit analysis is primarily concerned with the comparison of aggregate costs and aggregate benefits, whomever they accrue to. Notwithstanding this, decision-makers are often interested in the distribution of costs and benefits. The incidence of regulation costs does not depend on who initially pays for the regulatory costs but on the price elasticity of demand and the price elasticity of supply.

For regulatory costs that initially fall on producers in a competitive market, for example pest management technicians and agricultural entities, inelastic supply and elastic demand will result in the regulatory cost falling on producers (through reduced producer surplus), whereas in a situation where there is elastic supply and inelastic demand the regulatory costs fall mainly on consumers (through price increases). Most markets fall between these two extremes and so the incidence of regulatory costs is shared between producers and consumers. This outcome is relevant for costs such as training, licensing and record keeping for licensees and the agriculture sector.

Councils and State Government agencies are not profit making entities whose production and price is determined in a competitive market. They rely on funding from rate payers and tax payers respectively to fund their activities. Hence, increased costs on these entities, for example from user training, record keeping and notification, are inevitably passed on to rate payers and tax payers. For government costs associated with licensing of industry, these are directly passed onto industry via fees, with part of these costs in turn passed onto consumers.

Similarly, body corporates for multi-unit dwellings are not profit making entities whose production and price is determined in a competitive market. They rely on funding from members of the body corporate. Hence, additional regulatory costs are fully passed onto body corporate members, that is, the community.

Pesticide cost savings from more judicious use of pesticides will initially accrue to industry, governments and the agricultural sector. However, savings will ultimately be shared between producers and consumers, depending on the elasticity of supply and demand. Similarly, increased agricultural productivity benefits will also be shared between producers and consumers. Savings to governments will accrue to taxpayers.

Avoided health costs as a result of the Regulation primarily accrue to people involved in the use of pesticides but can also accrue to the broader community. Avoided environmental costs accrue to the broader community who hold values for the environment.

Appendix C – Sensitivity testing

Key drivers on the cost side of the analysis are user training costs and record keeping costs to industry. These account for 80% of the incremental costs of the proposed Regulation.

With respect to record keeping, the analysis allows for additional time costs of non-licenced users keeping more complete records, and keeping records when they otherwise wouldn't, as well as additional licenced users keeping records. Unit time costs are assumed to be constant for every additional record kept or every additional record where fuller documentation is prepared. However, arguably standardisation and use of technology are likely to reduce the costs of record keeping and hence these costs in the analysis are considered to be conservatively high.

The majority of training costs relate to users of pesticides becoming re-trained, rather than initial training. While current training providers have introduced online courses to meet the requirements for retraining, which should, over time, lead to lower per unit time costs to participants, currently retraining has similar time requirements as initial training. In this respect, the proposed Regulation includes a provision exempting pesticide users from the requirement to retrain every five years if they are participating in a recognised quality assurance scheme. The analysis assumes that over the life of the Regulation the number of agricultural users exempt from retraining because they belong in an accredited QA scheme ramps up to 30%. More rapid accreditation of QA schemes could significantly reduce the costs of the training costs of the proposed Regulation.

There is considerable uncertainty relating to the magnitude of the benefits of the Regulations. Notwithstanding this, significant changes to the assumptions underpinning any individual benefit category would have little impact on the outcome of the overall analysis. A key driver on the benefit side of the analysis is the assumed avoided environmental costs. This is based on the ratio of environmental costs to public health costs of pesticide use in the USA. No similar study exists in the Australian context. However, intuitively it would be expected that the environmental costs of inappropriate pesticide use would be higher than the health costs as individuals using pesticides have some incentive not to poison themselves but have less incentive when it comes to good environmental practice. Environmental impacts mainly relate to public goods rather than private goods, and hence relate to aggregated values across the population rather than values to individuals directly impacted.

Appendix D – IPART licensing framework requirements

This appendix outlines how the licensing scheme in the proposed Pesticides Regulation 2017 addresses the criteria of each of the four stages of the Licensing Framework[40] developed by the NSW Independent Pricing and Regulatory Tribunal (IPART).

Stage 1 – Appropriate licensing

A nationally harmonised licensing framework was determined necessary by the *National Framework for the Assessment, Registration and Control-of-Use of Agricultural and Veterinary Chemicals* ('the National Policy Framework') which was agreed to by all Australian jurisdictions. Current inconsistent licensing schemes create unfair business competition from an inconsistent operating environment between jurisdictions, that is, an unlevel playing field.

No alternative has been identified that would provide the same level of verification of competence, user traceability and compliance accountability. Pesticides are inherently risky substances and the National Framework recognises that licensing should only be required of higher risk users. Their usage patterns and locations are such that they present the greatest risk to human health and environment. The proposed licence categories includes pesticide users who receive fees for pest control services and thus benefit by means of financial gain from the use of pesticides, so it is appropriate that the costs of compliance activities can be recovered through licence fees.

The proposed licensing scheme ensures only fit and proper persons are able to operate as licenced pesticide users and allows verification that individuals have necessary training in chemical use, provides traceability and aligns permission to provide pest control services with responsibility for record keeping and for any chemical applications errors. Licensing businesses recognises they may also be legally accountable for errors, for ensuring chemical use records are kept and for implementing quality management systems.

The Pesticides Regulation is the only legislation that applies specifically to these classes of users and to how they use pesticides. While work health and safety legislation focuses on providing a safe work place it does not deal with harm from pesticide misuse to the environment, property or trade.

Stage 2 – Licensing design

The coverage is the minimum considered necessary, with most (more than 90%) of occupational pesticide users not required to hold a licence. The categories of licences align with the agreed National Policy Framework which entails licensing individuals and the businesses that employ them.

Fees in the proposed Regulation are set at cost-recovery levels, representing the minimum level of resources required to issue the licence and carry out an efficient risk-based compliance function. The fees are still less than those charged for comparable licences in other states. It is a single fee, with an additional, though minimal, fee in cases where a licence card needs to be replaced.

Licence duration has been set at five years which is the longest of any other State or Territory. This is considered the maximum workable duration in view of the level of 'churn' in licensees entering and leaving the industry (around 10% per annum for pest management businesses).

[40] Independent Pricing and Regulatory Tribunal: A best practice approach to designing and reviewing licensing schemes

There are no regular reporting requirements placed on licensees and the details required to submit a licence application are the minimum necessary to ascertain the applicant's eligibility.

The conduct rules imposed on licensees are in line with the increased risk associated with their pesticide usage. For example, pest management technicians are required to provide prior notification of pesticide use to residents of multiple occupancy buildings, applying the 'right to know' principle. Licensees are also required to keep some more detailed records of pesticide use, as compared to non-licensed users, and to display their licence numbers on work vehicles providing assurance and transparency to clients and the public.

The mandatory attributes placed upon licensees are limited to age and qualifications, except for the in the case of trainee permits where there is no minimum qualification specified. Minimum qualifications required are in line with national industry standards. Aerial licensees are required to hold a certification issued under *Civil Aviation Act 1988* and to have a certificate of approval issued by the industry's association. Pest management technicians and fumigators are required to meet standards of competency set out in the national standard.

The licensing scheme is subject to review every five years as part of the legislated review of the Pesticide Regulation

Stage 3 – Effective and efficient licence administration

Licence application details are entered and maintained in the EPA PALMS (Permitting and Licensing Management System). This system is also used for a variety of other EPA issued licences including radiation licences, dangerous goods licences and Environmental Protection Licences allowing for efficiencies in system development and maintenance. The system is well maintained and reliable and has processes to ensure data integrity.

Licence applications are processed, and applicants notified of the outcome, within five working days. The current application process is paper based, however the process will be moving online during 2017–18 as part of the staged roll-out of the EPA's E-connect program. This will make submitting a licence application and renewal even more efficient and convenient. Multiple options exist for paying fees including money order, cheque, credit card or direct deposit. Once the licence administration process goes online this payment options will also be quicker and more convenient.

For licensees, there are several ways of contacting the EPA's licencing administration area including phone and email. Applicants can also call the general Environment Line number with any enquiry regarding licensing of pesticide users. Current licence categories already have a dedicated web portal explaining details of submitting applications and obligations of licensees. Similar information will be made available for the new licence categories.

The application form only captures the necessary information to establish the applicants' qualifications and details to confirm they are a fit and proper person. There are no requirements for annual reporting or any other ongoing provision of information.

Client complaints regarding licensee activities can be directed to the Environment Line service where they are logged and tracked. Priorities of compliance campaigns are based on risk based approach with non-compliances handled according to the EPA Compliance Policy[41]. The Policy is based on risk-based regulation, matching regulatory responses on attitudes on compliance and providing transparency in decision making. Compliance and enforcement actions aim to raise awareness in safe pesticide use and encourage behavioural change.

[41] EPA Compliance Policy

Stage 4 – Licensing scheme is the best response

The proposed licensing scheme is the most appropriate response to the policy intention. It aligns with the harmonised licensing requirements of the endorsed National Policy Framework. Licensing is the appropriate response because of the high-risk nature of the chemical substances and quantities and locations in which these groups of users use pesticides.

Alternative options to the proposed licensing scheme are discussed in Section 4.1 of the RIS: base case (no licensing scheme) and remaking the Regulation with no changes (keeping only current licence categories). The costs and benefits discussed in Section 5. The benefits of the proposed legislation as a whole are detailed in Section 5.4. It is not possible to extract the specific benefits of licensing from the total, however, the cost benefit analysis found that overall remaking the Regulation would be desirable from an economic efficiency perspective.