Environmental Risk Management of Industrial Chemicals

Decision Regulation Impact Statement

June 2015

EXECUTIVE SUMMARY

This Decision Regulation Impact Statement (RIS) has been prepared by the Australian Government Department of the Environment on behalf of the Commonwealth, state and territory governments. The Council of Australian Governments (COAG) agreed to progress reforms related to the creation of a standards-setting body to make nationally consistent environmental risk management decisions in line with recommendations in the 2008 Productivity Commission Research Report on Chemicals and Plastics Regulation.

Following the release of the Consultation RIS in 2013, the purpose of this Decision RIS is to examine options to implement a nationally consistent approach to the environmental risk management of industrial chemicals within Australia, thereby addressing the current fragmented and inefficient approach that exists in Australia.

Without a consistent approach, there is the potential for infrequent or inconsistent implementation of environmental risk management leading to increased risk of environmental damage, increased costs and uncertainty for business, and erosion of public confidence.

The Problem

Industrial chemicals are used every day by everyone in a wide range of products and a range of uses including plastics and rubbers, paints, fuels, manufacturing, mining, household products, toiletries and cosmetics.

The majority of chemicals in everyday use are of low concern to the environment and human health. However, some chemicals can be harmful if exposed to the environment or people. If chemicals are not managed appropriately, they may result in environmental damage. Historical examples of environmental contamination indicate that remediating sites can take decades, cost hundreds of millions of dollars and impact the community through reduced access to resources. An example of this is the dioxin contamination in Sydney Harbour that has cost industry and government around $200 million in remediation to date and has resulted in a ban on commercial fishing in the harbour to protect the health of the public.

While the regulatory framework for chemicals has improved over the last two decades, the Australian regulatory framework for the management of risks to the environment from industrial chemical use remains complex. The management of environmental risks from industrial chemicals across jurisdictions is fragmented and inefficient, and less effective than other chemical risk management regimes, such as workplace health and safety and public health.

Industrial chemicals are assessed for health and environmental risks through the National Industrial Chemicals Notification and Assessment Scheme (NICNAS), under the *Industrial Chemicals (Notification and Assessment) Act* 1989 (ICNA Act). States and territories are responsible for implementing recommendations for managing the environmental risks of industrial chemicals in line with legislative frameworks. A significant amount of work is required to translate recommendations made by NICNAS into practical environmental risk management actions such as limiting release concentrations in certain locations. Consequently,

environmental risk management actions are often not implemented, or are only partially addressed on a jurisdictional basis.

Recommendations for environmental risk management of industrial chemicals are made to prevent harmful exposure of a chemical to the environment. If they are not consistently implemented, it leads to ineffective protection of the environment through a lack of knowledge of the environmental impacts of chemicals by both businesses and the community. The regulatory complexity and inconsistency also leads to confusion, gaps, duplication and increased costs and uncertainty for business. The key gap in the regulatory framework for environmental risk management of industrial chemicals is the lack of an institutional mechanism to coordinate the implementation of NICNAS's environmental recommendations by the states and territories.

The scale of the problem is realised with knowledge of the numbers of chemicals that undergo a NICNAS risk assessment. The current regulatory framework is inadequate to deal with the numbers of chemicals that are currently progressed through the system. Up to 20% of new industrial chemicals for which an environmental risk assessment is completed by NICNAS have the potential to have adverse effects on the environment if not appropriately managed. This number may be as high as 45% of the 38,500 existing industrial chemicals that were added to the Australian Inventory of Chemical Substances without assessment. Between 2012 and 2016, 3000 of these chemicals are being assessed for their risk to the environment and human health, adding to the volume of chemicals that may need risk management.

Policy Objectives

The reforms are being driven by two overarching objectives with the aim of addressing the environmental and business process concerns:

- To achieve better protection of the environment through improved management of the environmental risks posed by industrial chemicals.
- To provide a nationally consistent, transparent, predictable and streamlined approach to environmental risk management of industrial chemicals for governments, industry and the community.

Options for Action

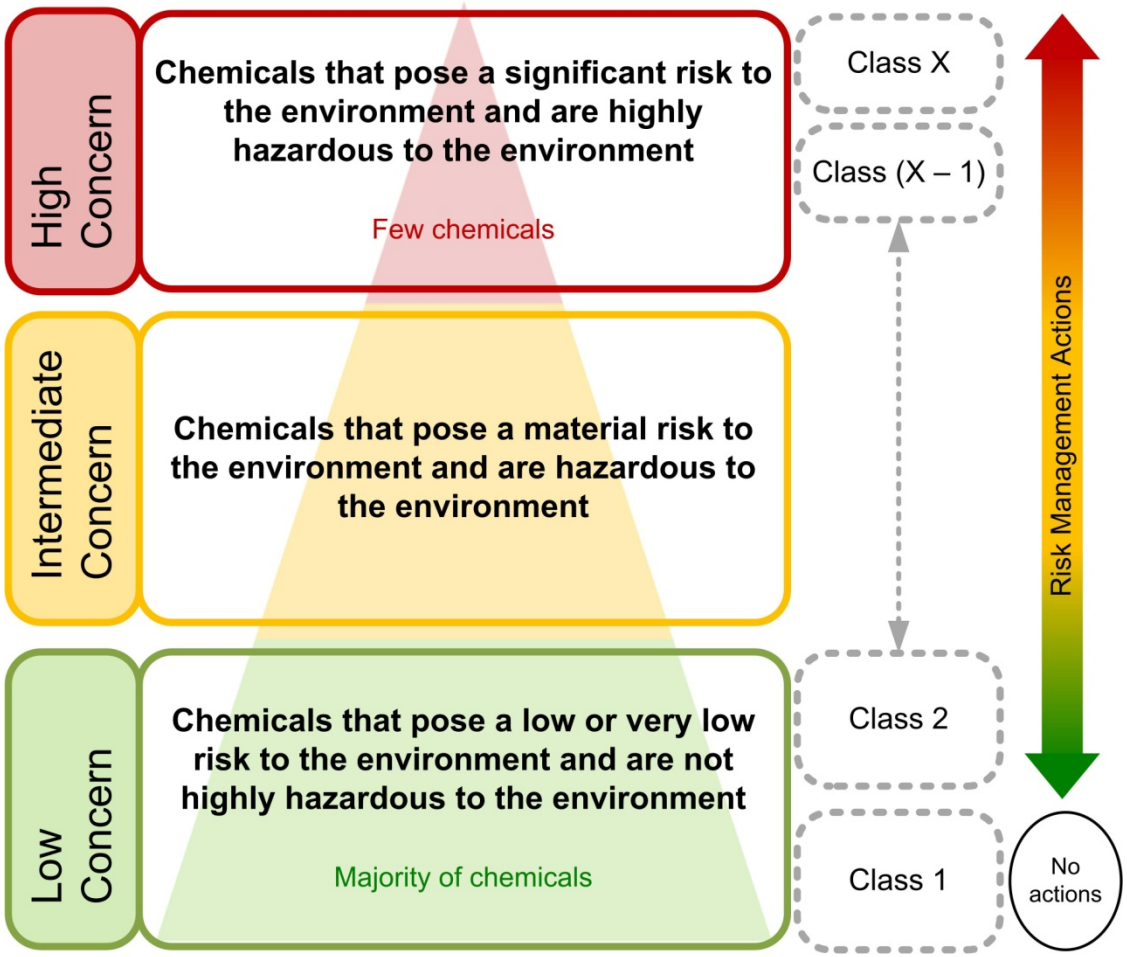
In order to address the objectives of the reforms, refinements to the proposed options in the Consultation RIS have been made. The proposed options establish arrangements equivalent to those that operate in other sectors such as poison scheduling, transport and workplace health and safety, and align with accepted international practices for environmental risk management.

The foundation of all of the policy options, apart from the base case, is the development of a National Standard for the environmental risk management of industrial chemicals. The Standard is designed to address the overarching objectives of the reforms; namely to increase environmental protection and to provide a streamlined, transparent, efficient and effective

framework for government, business and the community for the environmental risk management of industrial chemicals.

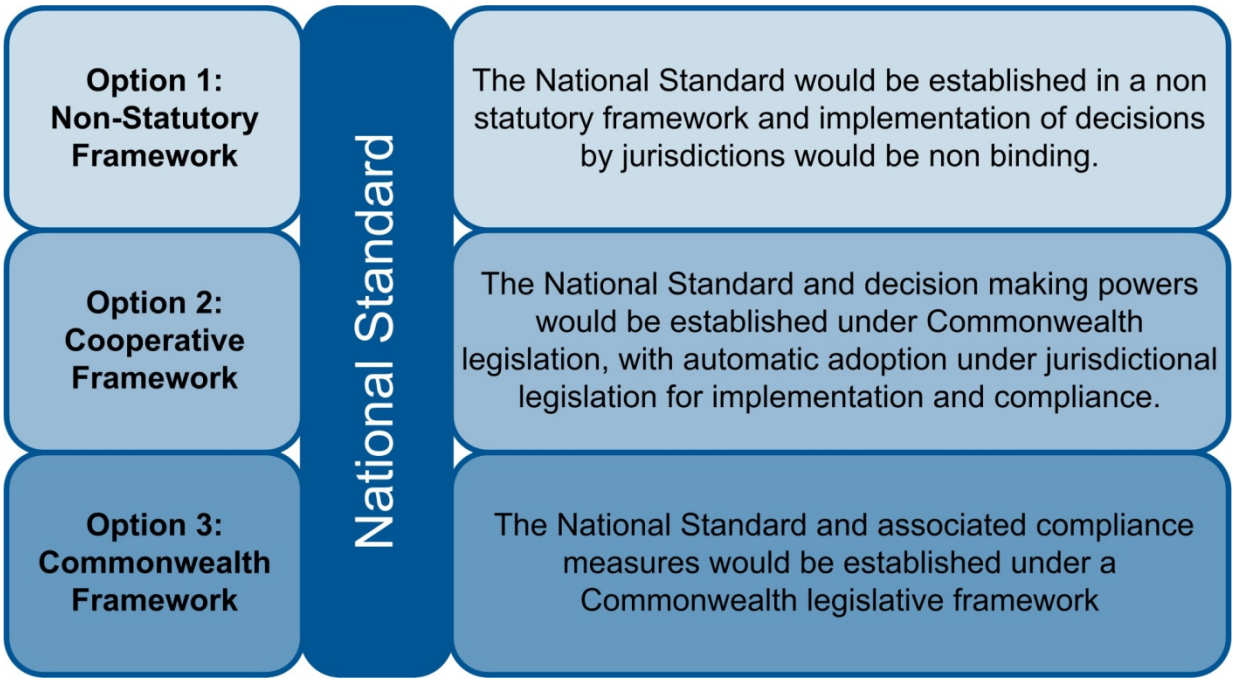
Each industrial chemical that is assessed in Australia for its impact on the environment is proposed to be scheduled under the National Standard according to the chemical's level of concern to the environment. The Standard will be developed upfront and have a set of pre-defined risk management outcomes appropriate to the chemicals' levels of concern to the environment, therefore keeping timeframes for decision making to a minimum. As the National Standard will be designed to be transparent and predictable, risk management decisions may be anticipated prior to chemical notification and this will also streamline the process. A conceptualisation of the Standard is outlined in the figure below.

THE NATIONAL STANDARD



NB: Concern Categories may be further broken down into a number of Classes or Schedules to allow for greater flexibility in the defined risk management actions.

In order to establish the proposed National Standard to strengthen the efficiency and effectiveness of the regulatory framework, three options for implementation are examined. These implementation options build from the base case and include a non-statutory approach, a cooperative approach and a system fully implemented by the Commonwealth.



Impact Analysis

The economic and social impact of environmental harm caused by certain industrial chemicals is well known and documented. In addition the fragmented nature of the current system means that businesses are potentially subject to different risk management and reporting requirements across jurisdictions.

Under all options, implementation of the National Standard is likely to result in increased protection of the environment and improve national consistency when compared to the base case. The extent to which these benefits are realised is dependent on the method of implementation of the National Standard. This is a reflection that consistency in the adoption of risk management decisions; the process by which decisions are made; and the mechanism for compliance and enforcement varies between the options.

To be able to quantify aspects of the proposed reforms that are not easily monetised, or extrapolated to a national scale over a large number of chemicals, two approaches were used to inform the conservative estimate presented below.

The two approaches were:

- A top down approach — this approach focused on looking at the overall size of the problem the proposal is trying to solve and then considering to what extent the Standard and associated processes will address this problem.
- A bottom up approach — this approach focused on establishing the net benefits/costs of changes to the status quo on an individual chemical basis and extrapolating across all chemicals assessed using the Standard every year.

The top down approach focused on determining the potential benefits from the National Standard including avoided contamination costs, avoided public health costs and increased national regulatory harmonisation for business. Case studies from the bottom up approach were used to inform the scaling of the top down approach by establishing the benefits and costs on an individual chemical basis. The top down approach is considered to be a conservative method of estimating the impact of the reforms and is based on the best available information for the costs of industrial chemicals on the community.

The analysis found that there was a significant net benefit under each of the options considered compared to the status quo. The greatest net benefit is achieved from Option 2 in the order of $112 million (over 10 years in present value terms). Options 1 and 3 had net benefits of $57 million and $105 million respectively.

	Option 1 $million	Option 2 $million	Option 3 $million
Impact on the community	109	181	181
Impact on business	-37	-59	-60
Impact on government	-15	-10	-16
Total net benefit	**57**	**112**	**105**

There is likely to be a significant benefit to the community from implementing this reform to the environmental risk management framework, from avoided site contamination and associated public health impacts. For example, based on known examples of site contamination, it is estimated that the benefit from cost avoided from this type of environmental incident could be up to $69 million (net present value over ten years). In addition, the community is likely to benefit from decreased risk of environmental exposure to industrial chemicals that have the potential to significantly impact on human health, in the order of $112 million (net present value over ten years).

The benefits to the community are likely to be realised under Option 2 and 3 as the rate of adoption and implementation is expected to be higher under a legislative framework. Option 1, being a non-statutory framework which will still require jurisdictions to consider legislation for each national decision individually, is estimated to only have a 60% uptake of environmental risk management recommendations. Therefore, the estimated benefit to the community is lower than compared to the other options.

The impact on industry as a result of the proposed options will depend on the assessed level of concern to the environment of the industrial chemicals used and whether businesses are subjected to changes in requirements for risk management. It is assumed that for the majority of chemicals scheduled under the Standard, businesses are likely to already be compliant as existing controls used by industry may already be sufficient to meet environmental risk management recommendations.

However, it is expected that the introduction of the Standard would increase the compliance costs for businesses operating in jurisdictions where risk management recommendations are

not readily or consistently adopted. These costs could be in the order of $59 million and $60 million (over 10 years in present value terms) for Options 2 and 3. The cost to industry is likely to be lower for Option 1 as it is less likely that risk management decisions will be adopted and implemented. This is set against the background of the chemicals and plastics industry which has an estimated value of $33 billion in annual turnover.

The Standard is proposed to be outcomes based. This approach allows industry the flexibility to determine how best to meet the required environment outcome for a particular chemical. It allows regulated entities to find the least cost solution to meeting the prescribed performance outcome and therefore encourages innovation.

Fragmented regulatory arrangements can increase complexity and can lead to duplication of effort for businesses operating across borders. It is expected that industry would benefit from the establishment of a nationally consistent approach to environmental risk management of industrial chemicals due to lower administrative and compliance costs associated with adhering to one National Standard rather than up to eight different requirements across all jurisdictions. It is estimated that this could lead to savings in the order of $3 million for business for options 2 and 3. This is likely to be lower for Option 1 as a lower level of national consistency is expected and businesses will still be subject to different risk management and reporting requirements across jurisdictions.

The proposed options would also provide industry with greater transparency, predictability and certainty as the proposed risk management actions would be publicly available and based on an existing, known Standard. Thus industry will be able to better understand and engage with the regulatory framework at an earlier stage. With the provision of self-assessment tools, the Standard would allow industry to make informed judgements about likely outcomes of the risk management process *prior* to applying for assessment under NICNAS and also provide an incentive to seek out ‘greener’ options.

In general, the government costs associated with developing and implementing the Standard are relatively modest. These costs will include the upfront costs associated with developing the National Standard and legislative and administrative arrangements necessary to implement the Standard; and the ongoing processes for administering the Standard. Option 2 is the least cost option for implementation at $10 million (net present value over 10 years). Option 1 and 3 are costed at $15 million and $16 million respectively.

The main difference in the costs is determined by the required level of involvement of the state, territory and Commonwealth governments to implement the Standard under the three options. A key ongoing cost to government under Option 1 is staff time required to facilitate the decision making process under the National Standard. This includes the time required by a Decision Maker or their delegate, operational costs for staff working on a secretariat of the National Standard, and jurisdictional resourcing of a Working Group for reviewing and commenting on risk management recommendations, as required. There would also be additional administrative costs to adopt each scheduling decision, through their own legislative framework on a case by case basis.

In contrast, under Options 2 and 3, the staffing requirements for jurisdictions is less than for Option 1 as the framework would establish an Advisory Committee rather than a Working Group composed of state and territory officials. Under Options 2 and 3, decisions would be automatically adopted and therefore there would be no consideration or regulation of chemicals by jurisdictions on a case by case basis. The increase in costs of Option 3 compared to Option 2 also reflects the potential for regulatory duplication and associated costs of establishing a new Commonwealth regulator.

Although the net benefits from changes to the way the environmental risks associated with industrial chemicals are managed are not easily quantified, it is highly likely that they will outweigh the costs associated with developing and implementing the Standard. Indeed, there are examples provided in the RIS that suggest that the benefits from just a few chemicals alone could potentially outweigh the costs of developing the Standard.

Conclusion

The reforms will facilitate a nationally consistent approach to environmental risk management of industrial chemicals by jurisdictions. The reforms will deliver positive benefits for business through a more streamlined, transparent, efficient and predictable approach to environmental risk management of chemicals. They also seek to align Australia's chemical management processes with accepted international practice for environmental risk management of industrial chemicals.

The Decision RIS has assessed Option 2 as being the preferred option for implementation of a national approach to environmental risk management of industrial chemicals. This conclusion is based on the following:

- The impact analysis indicates that there is likely to be a net benefit as a result of implementing any of the options relative to the base case.
- Option 1 is not expected to meet the overarching objective to provide a nationally consistent, transparent and predictable approach for environmental risk management of industrial chemicals to industry. Option 1 is also only expected to partially meet the objective of achieving better protection of the environment through improved management of the environmental risks posed by industrial chemicals. This is due to the non-binding nature of the option and potential for continued inconsistent implementation.
- Option 2 is expected to meet both of the overarching objectives of the reforms.
    - The net benefit for Option 2 is greater than Option 1 as consistency across jurisdictions is expected to be achieved and the environmental benefits of the reforms realised. The likely benefits are expected to be greater than Option 3, mainly due to expected efficiencies for Option 2 where regulatory efforts between the Commonwealth and states and territories are not expected to be duplicated.
- As with Option 2, Option 3 is expected to meet the overarching objectives of the reforms.

- As consistency across jurisdictions is anticipated to be achieved and the environmental benefits of the reforms realised, the likely benefits associated with Option 3 are greater than Option 1. However, the likely benefits for Option 3 would be less than Option 2, mainly due to duplication in regulatory effort between the Commonwealth and states and territories for Option 3 and the costs associated with establishing a new Commonwealth regulator.

- Option 2 is determined to be the least cost option for implementation of the National Standard in a manner that will achieve the described benefits. Therefore, Option 2 is considered to be the preferred option.

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ACRONYMS AND ABBREVIATIONS

ABS	Australian Bureau of Statistics
AICS	Australian Inventory of Chemical Substances
APS	Australian Public Service
BDE	Brominated diphenyl ether
BFR	Brominated flame retardant
CBA	Cost benefit analysis
CEPA	*Canadian Environmental Protection Act* 1999
COAG	Council of Australian Governments
CWS	Canada-wide Standards
EC	European Commission
ECHA	European Chemicals Agency
EPA	Environment protection agency/authority
EPHC	Environmental Protection and Heritage Council (the predecessor to SCEW)
EU	European Union
FRLI	Federal Register of Legislative Instruments
FTE	Full-time equivalent
GHS	Globally Harmonized System of Classification and Labelling of Chemicals
ICNA Act	The Commonwealth *Industrial Chemicals (Notification and Assessment) Act* 1989
IMAP	Inventory Multi-tiered Assessment and Prioritisation
MoU	Memorandum of Understanding
NChEM	National Framework for Chemicals Environmental Management
NICNAS	National Industrial Chemicals Notification and Assessment Scheme
NPV	Net present value
OECD	Organisation for Economic Co-operation and Development

PBDE	Polybrominated diphenyl ether
PBT	Persistent, Bioaccumulative and Toxic
Perc; PCE	Perchloroethylene
PEC	Priority Existing Chemical
PFOS	Perfluorooctane sulfonate
POP	Persistent Organic Pollutant
PV	Present value
REACH	Registration, Evaluation, Authorisation and Restriction of Chemicals
RIS	Regulation Impact Statement
SAICM	Strategic Approach to International Management of Chemicals
SCEW	Standing Council on Environment and Water (the successor to the EPHC)
TSCA	*Toxic Substances Control Act* (United States)
UN	United Nations
US(A)	United States (of America)

1 OVERVIEW OF THE REGULATION IMPACT STATEMENT

1.1 Purpose

This Regulation Impact Statement (RIS) examines options to implement a consistent approach to the environmental risk management of industrial chemicals within Australia, thereby addressing the current fragmented and inefficient framework. Without a consistent approach, there is the potential for infrequent or inconsistent implementation of the environmental risk management recommendations leading to increased risk of environmental damage, increased costs and uncertainty for business and decreased community confidence.

The purpose of the RIS is to provide options for efficient and effective approaches to environmental risk management of industrial chemicals for the protection of the environment and benefit of the community and business.

The RIS has been prepared by the Australian Government Department of the Environment on behalf of the Commonwealth, state and territory governments. It builds on the Consultation RIS released in April 2013 by the former Standing Council on Environment and Water on behalf of the Council of Australian Governments (COAG).

This RIS follows the COAG Best Practice Regulation Guidelines[1] for regulatory proposals made by Ministerial Councils and National Standards.

1.2 Report Structure

The RIS is structured as follows:

- Chapter 2 provides the background and policy context for the RIS
- Chapter 3 describes the problem that governments are seeking to address including current regulatory requirements and impacted stakeholders
- Chapter 4 establishes the principles and objectives for government action
- Chapter 5 describes the policy options being considered in the RIS
- Chapter 6 outlines the impact analysis that has been undertaken on each of the options described in Chapter 5
- Chapter 7 summarises consultation during the development of the RIS
- Chapter 8 summarises the implementation and review processes
- Chapter 9 evaluates the proposed reforms and summarises conclusions of the RIS

[1] Council of Australian Governments (2007), Best Practice Regulation – a guide for ministerial councils and national standard-setting bodies

2 BACKGROUND AND POLICY CONTEXT

2.1 Policy Context

In 2006, COAG identified chemicals and plastics as a 'regulatory hotspot' and requested that the Productivity Commission review Australia's system of regulating chemicals and plastics across all sectors. The Productivity Commission's *Research Report on Chemicals and Plastics Regulation*[2] highlighted that management of environmental risks from industrial chemicals across jurisdictions was fragmented and inefficient, and less effective than other chemical risk management regimes.

The Productivity Commission also recognised that existing national regulatory arrangements for industrial chemicals were not sufficient to provide adequate environmental protection.

The primary finding was that environmental risk management recommendations from the risk assessments of industrial chemicals conducted under the National Industrial Chemicals Notification and Assessment Scheme (NICNAS) were adopted infrequently and inconsistently by state and territory risk management regulators.

The Productivity Commission report made a number of recommendations to address the problems identified. With respect to environmental impacts of industrial chemicals, these recommendations included:

- an assessment of the costs and benefits of introducing environmental labelling of industrial chemicals (Recommendation 9.1)
- the establishment of a standards-setting body to develop national environmental risk management decisions for industrial chemicals (Recommendation 9.2)
- examination of the feasibility of developing a performance measurement framework for monitoring the impact of chemicals in the environment (Recommendation 9.3).

To address the recommendations in the Productivity Commission report, COAG agreed to the recommendations and tasked Environment Ministers with their implementation. The key reform is the creation of a standards-setting body to make national risk management decisions to protect the environment against harmful chemicals (Recommendation 9.2).

The standard-setting body would close a significant gap in current risk management arrangements for the environment and provide for a nationally consistent decision on the environmental risk management of industrial chemicals. This will address currently unmanaged risks which could result in adverse impacts, including inter-generational impacts, to the environment and associated affects on human health.

It will also deliver certainty and greater consistency in regulation for chemical producers and users in Australia. Where risk management responses are implemented, there are typically inconsistencies in approaches across jurisdictions, which can be confusing for the businesses

[2] Report available on the Productivity Commission's website

affected by the regulation. This can also lead to high compliance costs on those businesses operating across jurisdictions that have to adhere to the differing rules and regulations. Further, the differing regimes create the potential for imperfect competition where businesses are subject to differing compliance regimes and costs.

Progression of the reforms related to 9.1 and 9.3 will be determined once the form of the standards-setting body has been identified and agreement has been reached, to ensure all three recommendations are implemented efficiently.

2.2 Consultation Regulation Impact Statement

On 11 April 2013, the former Standing Council on Environment and Water (SCEW) released the COAG *Consultation Regulation Impact Statement: Chemical Environmental Risks*[3] (Consultation RIS). The Consultation RIS was prepared by PricewaterhouseCoopers on behalf of the Commonwealth, states and territories. It proposed three options to develop a standard-setting body to make national environmental risk management decisions for industrial chemicals.

The options in the Consultation RIS ranged from a non-statutory framework where adoption of national decisions by jurisdictions would be non binding (Option 1), through to a framework fully implemented by the Commonwealth (Option 3). The preferred option identified in the Consultation RIS based on the greatest net benefit (Option 2) was a co-operative model underpinned by Commonwealth legislation for decision making (or standard-setting) and jurisdictional legislation for implementation and enforcement.

The findings from the Consultation RIS are outlined in Appendix B.

2.3 Consultation Outcomes

PricewaterhouseCoopers facilitated public consultation on the options presented in the Consultation RIS. They held a series of focus groups across the country and invited written submissions over an eleven week period, ending on 28 June 2013. Approximately fifty people from government agencies, industry bodies, individual companies and non-government organisations attended the focus groups and eleven written submissions were received.

Stakeholders agreed that there is benefit in government reform to protect the environment and improve the effectiveness and efficiency of risk management actions for industrial chemicals that have the potential to cause environmental harm. Feedback received favoured an approach that harmonises implementation of national decisions, is economical and integrated with the proposed changes arising from the review of the NICNAS as well as existing risk management frameworks implemented by states and territories.

For further discussion on Consultation refer to Chapter 7.

[3] The Consultation RIS can be found on the Standing Council on Environment and Water website

3 NATURE AND EXTENT OF THE PROBLEM

This chapter of the RIS aims to identify the fundamental problem that the government is seeking to address in order to make a case for government action. In discussing these problems, this chapter will:

- present evidence on the magnitude of the problem
- document relevant existing regulation and demonstrate that it is not adequately addressing the problem
- identify the relevant risks and estimate the probability of an adverse outcome
- present a clear case for considering that additional government action may be warranted, taking account of existing regulation and any risks

3.1 The chemicals and plastics industry

The chemicals industry is one of the largest economic sectors in the world[4]. Chemicals are found in thousands of products used every day by the general public and the industrial sector. Nearly every manmade material contains one or more of the thousands of chemicals produced by the industry each year. Chemicals provide the community with a wide range of benefits. They are key drivers of industrial and agricultural productivity and facilitate advances in consumer products and medical treatments.

The global chemicals industry has grown steadily over the past several decades. Chemical industry data cited by OECD indicate that global chemical industry output was valued at US$ 171 billion in 1970. In 2010, industry sources valued global output at US$ 4.12 trillion with China being the largest chemical producing country with sales of US$ 754 billion. OECD countries currently account for around 63% of world production, and BRIICS (Brazil, Russia, India, Indonesia, China and South Africa) account for 28%[5].

The Australian chemicals and plastics industry is one of the largest manufacturing sectors in the country, contributing $11.5 billion to the gross domestic product and employing nearly 75,000 people (see Figure 3-1). The use of chemicals spans a range of industry sectors from cosmetics to mining, and textiles to construction (see Figure 3-2). Industrial chemical users also range from multinational conglomerates to family-owned small businesses.

This RIS will discuss environmental risk management of industrial chemicals[6]. Industrial chemicals are defined under the Commonwealth *Industrial Chemicals (Notification and Assessment) Act* 1989 (ICNA Act) and exclude chemicals used in agricultural products and veterinary medicines, therapeutic goods and medicines, and foods and food additives.

[4] OECD (2010) Cutting Costs in Chemicals Management – How OECD helps governments and industry, available on the Organisation for Economic Co-operation and Development website.

[5] UNEP (2013), Global Chemicals Outlook – Towards Sound Management of Chemicals.

[6] See Appendix A for a glossary of terms relating to risk management and industrial chemicals

Figure 3-1: Snapshot of the Australian chemicals and plastics industry[7]

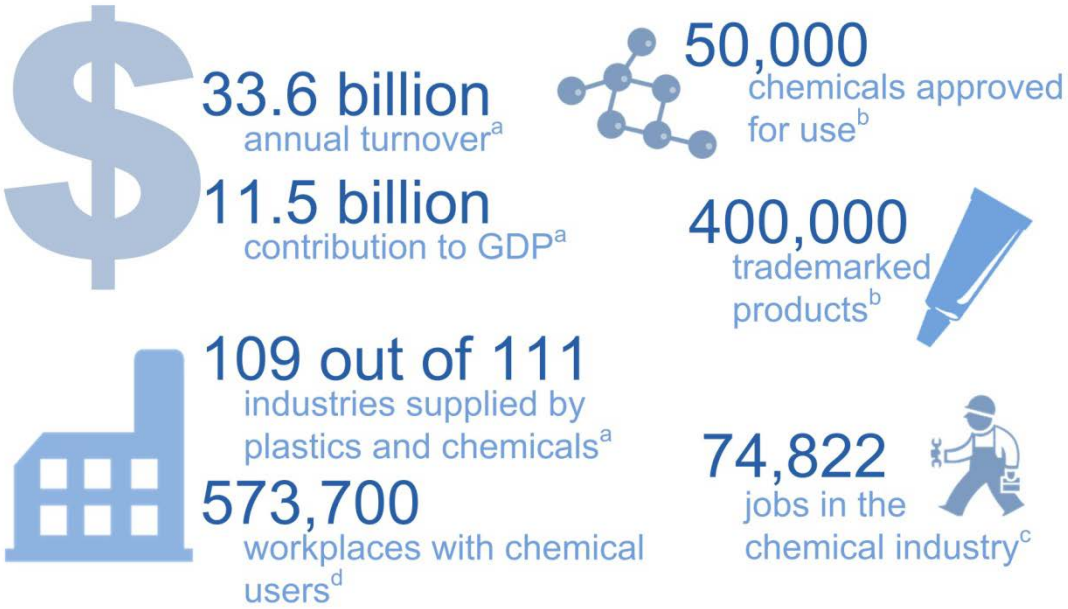
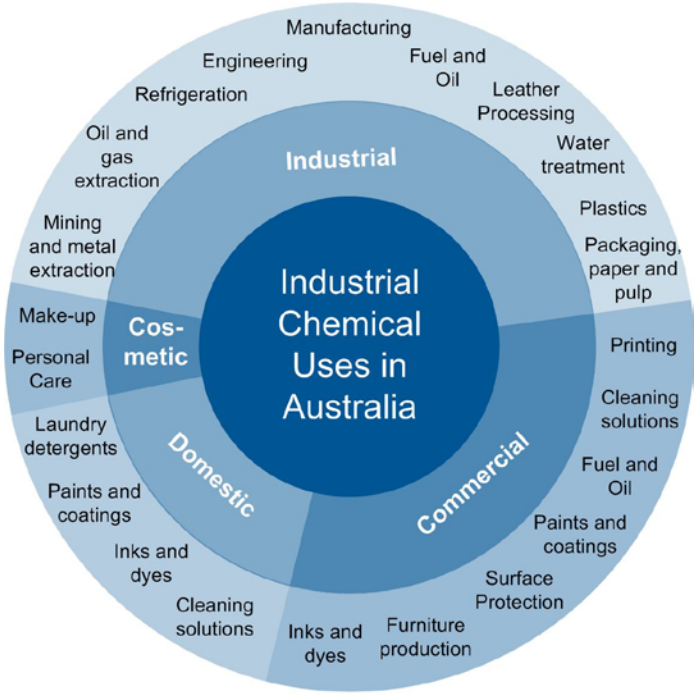


Figure 3-2: Examples of industrial chemical uses in Australia[8]**.**



Industrial use segments are generally consistent with the proportion of new industrial chemicals assessed under the ICNA Act in 2013-2014

[7] (a) Plastics and Chemicals Industry Association (2011), Annual Report; (b) COAG (2008), Report on the Control of Chemicals of Security Concern; (c) Australian Bureau of Statistics, 8155.0 Australian Industry 2011-12; (d) Australian Safety and Compensation Council (2006) Draft Regulation Impact Statement: Proposed Revisions to the National OHS Framework for the Control of Workplace Hazardous Substances and Dangerous Goods

[8] NICNAS Annual Report 2013-14.

3.2 The Need for Action

3.2.1 Chemicals can be harmful to the environment

The majority of chemicals in everyday use are of low concern to the environment and human health. However, if not appropriately managed some chemicals may be exposed to the environment at levels that cause adverse effects on the environment, including humans. Historical examples show that the scale of the problems caused by poor management of industrial chemicals can be large and long lasting. Remediation costs that could have been avoided with proper chemicals management can run into hundreds of millions of dollars[9] (See Box 1 and Appendix C).

Box 1

Dioxins in Sydney Harbour

Rhodes Peninsula sits on the Parramatta River near the site of the 2000 Sydney Olympic Games. The Peninsula was the site of industrial activity for over 100 years. This activity included the production of herbicides and pesticides such as 2,4-D, an ingredient that was used in Agent Orange in the Vietnam War. Wastes from the industrial activity were used for land reclamation and were also drained directly into Homebush Bay.

The wastes included toxic chemicals such as dioxins and furans that are listed on the Stockholm Convention for Persistent Organic Pollutants (POPs). POPs are a group of persistent environmental pollutants that accumulate in the food chain, are highly toxic and, in the case of dioxins, can cause reproductive and developmental problems, damage the immune system, interfere with hormones and cause cancer[10]. These chemicals have extended into the Parramatta River and Sydney Harbour resulting in some of the highest concentrations of dioxins in major cities around the world. Dioxin concentrations are approximately ten times higher than Tokyo Bay and 50 to 100 times higher than Hong Kong Harbour[11].

The New South Wales Environment Protection Authority (and its predecessor entities) has been regulating the clean-up of this area for over 20 years. Around $200 million has been spent by industry and the NSW government to clean up the contaminated sediments around the Peninsula[12].

Remediation of Sydney Harbour continues to this day and the NSW government has banned commercial fishing in Sydney Harbour due to high levels of dioxins that accumulate in fish. Recreational fishing is still allowed, however the NSW government recommends that fish caught to the west of the Sydney Harbour Bridge are not consumed[13].

[9] NSW Audit Office (2014) Managing Contaminated Sites; See Box 8. NSW EPA (2013), Regulatory Impact Statement – proposed Contaminated Land Management Regulation 2013.

[10] Stockholm Convention on Persistent Organic Pollutants.

[11] Environmental Protection Department, The Government of Hong Kong, Special Administrative Region

[12] New South Wales Auditor-General's Report – Managing Contaminated Sites (2014)

[13] New South Wales Department of Primary Industries.

Flame Retardants in Antarctica

Flame retardants are chemicals that are added to manufactured products to suppress or delay the production of flames and inhibit the spread of fire. They are found in every household in the country in articles such as furniture, clothing, electronics, plastics and building materials. Some flame retardants are persistent and can accumulate in the environment. Several flame retardants have been listed on the Stockholm Convention for Persistent Organic Pollutants due to their bioaccumulation potential, toxicity, persistence and potential for long range transport[14].

Apart from some flame retardants being detected in blood samples, breast milk and almost all indoor air, they have also been detected in the world's pristine environments such as Antarctica. Areas of Antarctica that are virtually untouched by human activity have detectable levels of flame retardants, confirming that some flame retardants are transported considerable distances from their source[15, 16]. Flame retardants have been detected in Antarctic lichens and mosses which are considered good indicators of atmospheric pollution as they absorb contaminants directly from the air[17]. They have also been detected in eggs of Antarctic seabirds such as chinstrap and gentoo penguins, which are non-migratory species endemic to Antarctica[18].

Globally, there are numerous examples of chemicals that were widely used for many years before it was realised that they were having serious adverse impacts on the environment and human health. Some of these toxic chemicals persist in the environment for many years, are distributed and transported in air and water worldwide and accumulate in the food chain harming wildlife and humans.

Risk of exposure of a chemical to the environment is the central consideration in the need for environmental management of chemicals. Chemicals may be released to the environment at any stage during their lifecycle. Figure 3-3 gives an overview of the lifecycle of chemicals as well as the exposure routes from different stages during the lifecycle, noting all stages have the potential for environmental exposure. Because of the breadth of industries that use industrial chemicals in Australia, these chemicals may be released at any number of locations across the nation every day. This could include release from industrial, commercial and domestic sources.

All chemicals that are managed appropriately should present a low risk to the environment. However, whether through a lack of knowledge or improper management, some hazardous chemicals are causing harm to the environment. Indeed, Australia has a legacy of environmental damage as a direct result of chemical use, industrial processes and waste disposal (See also Appendix C).

[14] Stockholm Convention on Persistent Organic Pollutants.

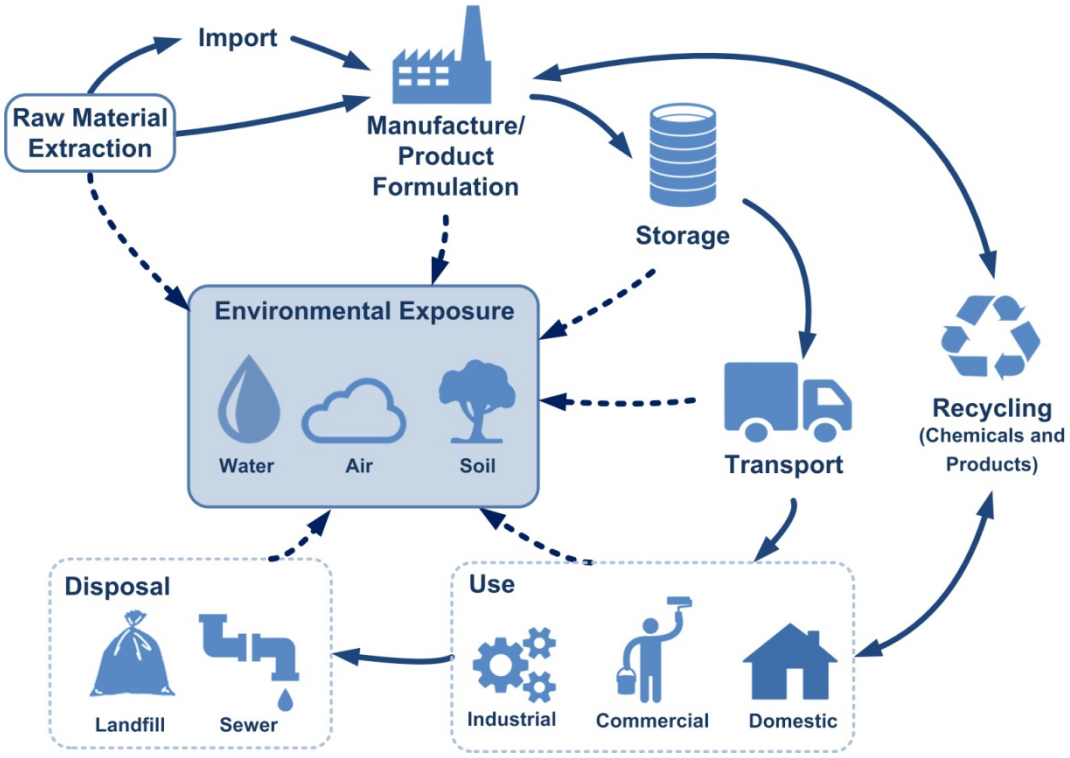
[15] Covaci, A. et al. (2011) Novel brominated flame retardants: A review of their analysis, environmental fate and behaviour. *Environment International*, 37, pp 532-556

[16] Moeller, A. et al. (2012) Brominated Flame Retardants and Dechlorane Plus in the Marine Atmosphere from Southeast Asia toward Antarctica. *Environmental Science and Technology*, *46* (6), pp 3141–3148

[17] Yogui, G.T. and Sericano, J.L. (2008) Polybrominated diphenyl ether flame retardants in lichens and mosses from King George Island, maritime Antarctica. *Chemosphere*, 73 (10), pp 1589-1593

[18] Yogui, G.T. and Sericano, J.L. (2009) Levels and pattern of polybrominated diphenyl ethers in eggs of Antarctic seabirds: Endemic versus migratory species. *Environmental Pollution*, 157, pp 975-980

Figure 3-3: Chemical lifecycle and exposure[19]



3.2.2 The current regulatory arrangements are not fully effective

In general, responsibility for the environmental management of chemicals is shared between jurisdictions. The Commonwealth undertakes most hazard and risk assessments at a national level and contributes to international chemicals management through provision of expertise and completion of joint assessment processes. Industrial chemicals are assessed for their risk to human health and the environment by the Commonwealth under the ICNA Act and National Industrial Chemicals Notification and Assessment Scheme (NICNAS). Further details regarding NICNAS and industrial chemicals regulations in Australia are provided in Appendix D. Risk management of industrial chemicals is outside the scope of the ICNA Act.

States and territories typically deal with implementation of risk management approaches and on ground compliance and enforcement. Each jurisdiction has its own regulations regarding the environmental management of industrial chemicals. The state and territory agencies and legislation for environmental risk management of industrial chemicals are outlined further in Appendix E.

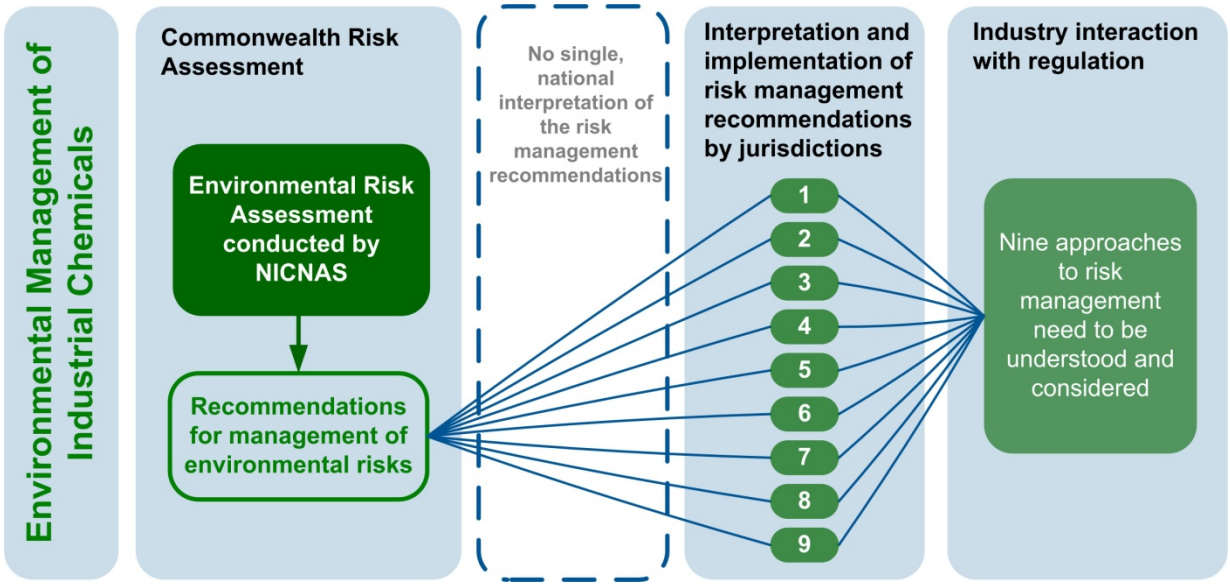
Under the ICNA Act, NICNAS make recommendations to risk managers in the Commonwealth, states and territories for appropriate management of chemicals. The aim of risk management is to limit exposure of some chemicals in the workplace, to the public or to the environment. In terms of environmental risk management, states and territories are

[19] Adapted from UNEP (2013), Global Chemicals Outlook – Towards Sound Management of Chemicals, page 10.

responsible for determining how best to develop appropriate and implementable risk management actions for businesses to comply with.

It is difficult to determine whether environmental damage as a result of chemical use as described in Box 1 would have occurred to a similar extent under the current chemicals framework. Assessing the effectiveness of environmental protection regulation in reducing the impact of chemicals on the environment is a difficult task. There are little data on environmental outcomes in Australia, let alone data specifically relating to the impact of chemicals[20]. The assessment of chemicals under NICNAS has increased the information about chemicals to governments, industry and the community, and the risk management of chemicals implemented by states and territories has lessened the risks of assessed chemicals to some degree. However, as noted by the Productivity Commission, "*there is no institutional mechanism to coordinate the implementation of ... NICNAS's environmental recommendations by the states and territories.*" The adverse effects on the environment of not appropriately managing industrial chemicals can be expected to continue if the current gap in the regulatory framework is not adequately addressed. Figure 3-4 outlines the current regulatory framework for environmental management of industrial chemicals, highlighting where the gap in the current regulatory framework exists.

Figure 3-4: Current framework for environmental management of industrial chemicals



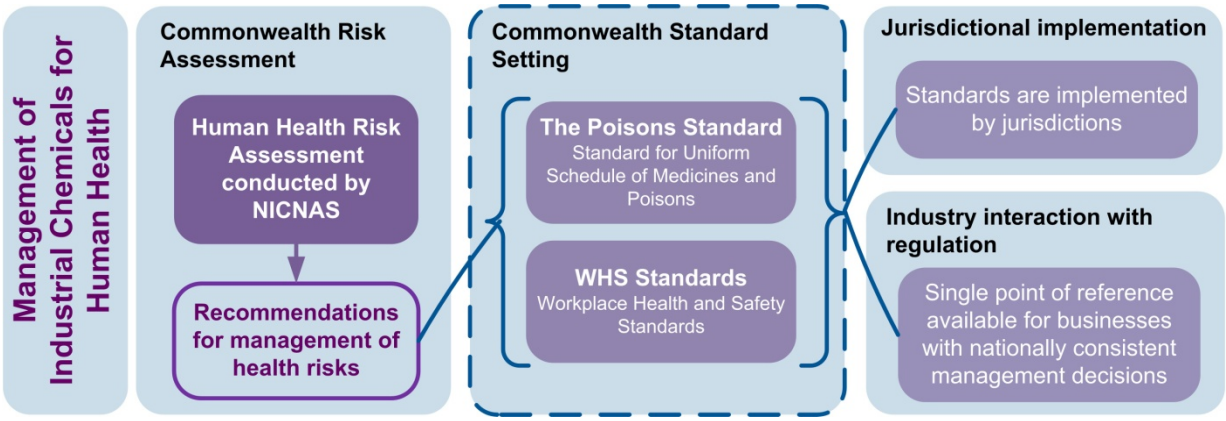
The central finding of the Productivity Commission report was that, while '[c]urrent regimes are broadly effective in managing risks to health and safety', they are 'less effective in managing risks to the environment'[21]. The current framework for the management of risks to human health involves the process of standard-setting at the Commonwealth level which provides the states and territories, businesses and the public a single reference point for management of industrial chemicals for the purposes of public health and workplace health and safety. For example, if a chemical is found to be hazardous to human health, it may be scheduled on the Standard for Uniform Scheduling of Medicines and Poisons (The Poisons Standard). Each

[20] Productivity Commission (2008), Plastics and Chemicals Regulation, Research Report

[21] Productivity Commission (2008), Plastics and Chemicals Regulation, Research Report

schedule has associated management requirements depending of the level of risk of the chemicals. The current framework for management of industrial chemicals for human health is outlined in Figure 3-5.

Figure 3-5: Current framework for management of industrial chemicals for human health



The current regulatory arrangements for environmental risk management of industrial chemicals are not providing a consistent, efficient and effective approach industrial chemicals management. This has the potential to result in negative externalities[22] that may impact the Australian environment and human health, such as increased costs to businesses and the community and erosion of public confidence.

NICNAS fulfils its statutory requirement to assess the risks to the environment of industrial chemicals based on advice from the Department of the Environment. States and territories fulfil their current requirements under their own legislation. The gap in the framework lies where states and territories determine the most appropriate risk management for chemicals, based on local conditions. As the Productivity Commission noted *"[t]here are some differences in the way that each state and territory regulates for environmental protection, including with respect to chemicals and plastics. This can reflect the different environments across jurisdictions and the manner in which different regulatory regimes have evolved*." However, this results in inconsistency which is discussed further in Section 3.2.2.1.

The scale of the problem is realised with knowledge of the numbers of chemicals for which a NICNAS risk management recommendation is made. On average, between 150 and 200 environmental risk assessment reports are prepared for new industrial chemicals by NICNAS per year. Typically 25 to 45 of these chemicals are estimated as potentially having environmental impacts if not appropriately managed.

The current framework is inadequate to deal with the volume of chemicals needing risk management. In the absence of a national framework for ensuring the uptake of environmental risk management recommendations, past actions to protect the environment have required special arrangements. These have been restricted to a few groups of chemicals, typically those with international implications. Examples include those dealt with under the National

[22] A negative externality is a cost to a party that did not choose to incur that cost, for example, contamination of a river and its fish, and subsequent consumption of the contaminated fish.

Strategy for the Management of Scheduled Wastes that was developed by the Australian and New Zealand Environment and Conservation Council from July 1991 to November 1992[23].

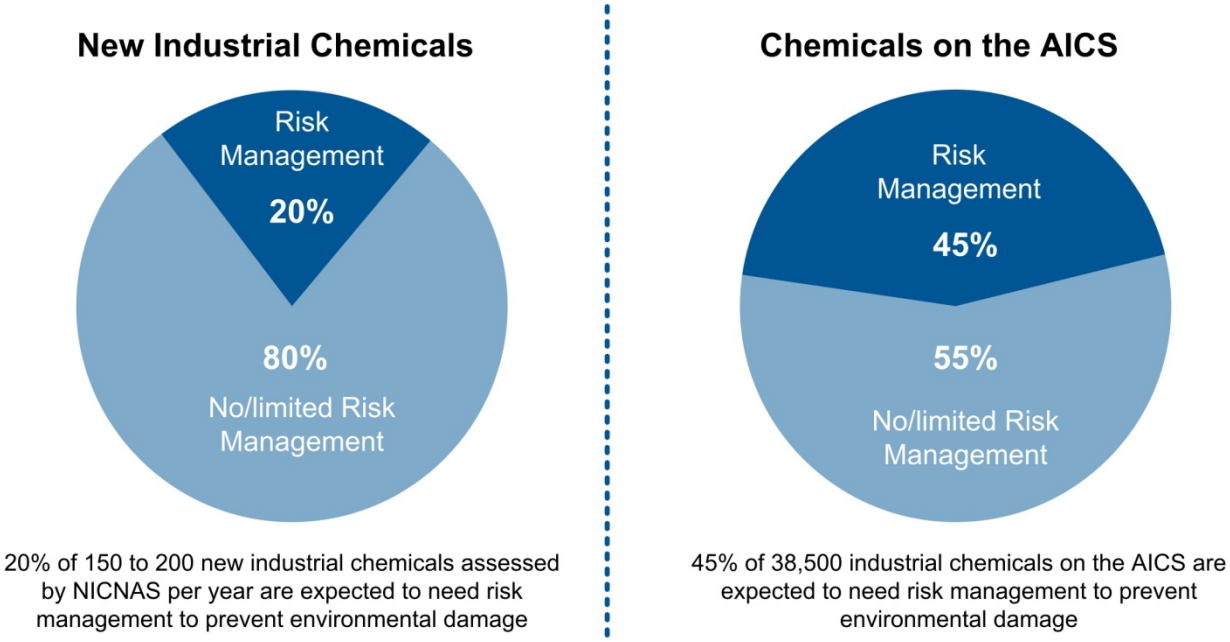
With the substantial development time needed for this approach, which did not have an existing structure to facilitate implementation, it is one which could only be used for a small number of high priority existing chemicals and can only accommodate decision making over years rather than days. Such an approach would not be appropriate for the number of new-to-market chemicals with potential environmental impacts which come through the NICNAS new chemicals process each year.

In addition to new chemicals requiring risk management, the number of industrial chemicals requiring action by jurisdictions may increase markedly over the next decade if NICNAS continues its assessment of the 38,500 industrial chemicals that were grandfathered onto the Australian Inventory of Chemical Substances (AICS). These chemicals, currently allowed to be used in Australia, have not previously been assessed for their risks to human health or the environment. Initial indications arising from the trial of the Inventory Multi-tiered Assessment and Prioritisation (IMAP) framework set up to assess the chemicals suggest that a portion would require some level of risk management. This portion is estimated to be up to 45%[24]. Figure 3-6 highlights the likely numbers of chemicals that may need management in order to protect the environment.

[23] The Strategy included three management plans PCB Waste Management Plan (prepared April 1994 to November 1995), Hexachlorobenzene Waste Management Plan (prepared August 1994 to November 1996) and Organochlorine Pesticides Waste Management Plan (prepared July 1996 to September 1997).

[24] This estimate is based on a review of historical assessments from 2012-2014, consideration of the hazards and risks to the environment and expert advice from risk assessors at the Department of the Environment

Figure 3-6: Proportions of industrial chemicals that may require environmental risk management to prevent damage to the environment[25]



Other major deficiencies for the environmental management of industrial chemicals that are resulting in an inefficient and ineffective regulatory framework are detailed below.

3.2.2.1 Duplication and Inconsistency

A significant amount of work is required for states and territories to translate NICNAS recommendations into practical risk management actions. Environmental risk management actions are often not implemented, or are only partially addressed on a jurisdictional basis. This regulatory complexity and inconsistency leads to confusion, gaps, duplication and increased costs and uncertainty for business. Businesses and the community do not have a single point of reference for coordinating decisions at a national level.

Each state and territory government is required to develop its own response to an interpretation of NICNAS recommendations. Overall, advice from state and territory governments notes this can have high administration costs that may lead to governments, which are resource-constrained, not prioritising action to protect the environment. This is particularly an issue in cases where action is shown to be necessary to avoid the risk of harm.

Where action does occur there are typically inconsistencies in approaches across jurisdictions, which can be confusing for the businesses affected by the regulation. The current system imposes unnecessarily high compliance costs on those businesses operating across jurisdictions that have to adhere to the differing rules and regulations. This can create the potential for imperfect competition where businesses are subject to differing compliance regimes and costs.

[25] Proportions are based on expert advice provided by risk assessors at the Department of the Environment and a review of historical assessments from 2012-2014. See also Appendix G.

The inconsistency in the uptake of environmental risk management recommendations from NICNAS is shown by the results of a survey that was sent to jurisdictions to inform the development of the Consultation RIS. Respondents were asked to indicate whether and how their jurisdiction had implemented a number of NICNAS recommendations. Only one of the recommendations was implemented by all jurisdictions (Table 3-1).

Table 3-1: Implementation of selected NICNAS environmental risk management recommendations[26]

NICNAS recommendation	Jurisdiction			
	A	B	C	D
Triclosan				
Recommendation 7	Yes	Yes	Yes	Yes
Recommendation 8a	Yes	No	No	Yes
Recommendation 8b	Yes	No	No	Yes
Recommendation 8c	Yes	No	No	No response
Sodium cyanide				
Recommendation 4a	Yes	Not directly	No	Not directly
Recommendation 4b	Yes	Not directly	No	Not directly
Recommendation 5a	Yes	Not directly	No	Not directly
Formaldehyde	No	No	Not applicable	Not directly
Methylcyclopentadienyl Manganese Tricarbonyl	Yes	Not directly	No	No response
Tetrachloroethylene	Yes	Not directly	Not applicable	No response

The majority of industrial chemicals are expected to be used in multiple jurisdictions or nationally. Consistency in uptake by affected jurisdictions is necessary for effective environmental protection and to avoid costs and confusion for businesses using the chemical in different jurisdictions. It is important that potentially harmful chemicals can be safely managed as use of these chemicals may offer significant benefits to the community and business innovation provided that their potential environmental impacts are avoided.

In 2008, NICNAS commissioned a study on the *Uptake of NICNAS's Priority Existing Chemical Recommendations by Government Chemical Management Bodies*[27]. The paper supports the Productivity Commission's findings and also found that recommendations 'were not generally directly adopted by states and territories' though it was noted that the intent of the

[26] PricewaterhouseCoopers survey sent to NChEM members for preparation of the Consultation Regulation Impact Statement on Management of Chemical Environmental Risks (2013).

[27] *Uptake of NICNAS's Priority Existing Chemical Recommendations by Government Chemical Management Bodies*

recommendations were at times addressed in broader projects, generic actions or legislation by states and territories.

The reasons identified by the Productivity Commission for the infrequent and inconsistent uptake of risk management measures based on NICNAS recommendations were:

- First, while the hazards and risks of new and existing chemicals can be assessed under NICNAS, its environmental risk management recommendations are not mandatory. It is left to the discretion of jurisdictions to implement risk management measures based on NICNAS recommendations.
- Second, unlike other policy areas (e.g. poisons scheduling, transport and workplace safety), there is no national body to consider NICNAS environmental risk management recommendations and develop detailed and appropriate risk management decisions for implementation by jurisdictions.
- Third, the provision for consultation with state and territory environment agencies during the development of the NICNAS risk management recommendations has been limited, which has resulted in recommendations that were impractical to implement in some jurisdictions (primarily due to the variance in control measures, policy settings and infrastructure available across jurisdictions). There is a Memorandum of Understanding (MOU) between the Ministers with responsibility for industrial relations in each jurisdiction relating to NICNAS, with a committee that meets to discuss implementation of NICNAS recommendations. While the intention was that the Ministers were signing on behalf of their jurisdiction, the PC noted that it has largely been ineffective with respect to environmental recommendations.

It is important to note that these gaps reflect the shorter history that chemical regulation has had to evolve to protect the environment compared with longer established sectors, such as workplace health and safety, which already have in place mechanisms to address similar problems. In effect, the regulatory system for environmental protection is not yet complete.

3.2.2.2 Information Failures

A key gap in environmental regulation is the lack of knowledge of the environmental impacts of chemicals. The Productivity Commission noted that: 'Assessing the effectiveness of environmental protection regulation in reducing the impact of chemicals on the environment is a difficult task. There are little data on environmental outcomes in Australia, let alone data specifically relating to the impact of chemicals'[28].

Regulators are limited in their capacity for ensuring that businesses handling, storing, using or disposing of industrial chemicals have ready information to assist them to minimise the risk of environmental damage from chemicals. This increases the risk that chemical hazards will not be correctly managed.

[28] Productivity Commission 2008, Chemicals and Plastics Regulation, Research Report, Melbourne, page 243.

Currently, there are no mechanisms for gathering and utilising information from existing environmental risk management approaches overseas. There are also no mechanisms for formal sharing of information on the impacts of industrial chemicals amongst experts in environmental risk managers within Australia. Therefore, there is reduced capacity for environmental risk managers to appropriately tailor risk management actions based on the level posed to the environment by different chemicals.

A hypothetical example of a chemical of significant environmental concern progressed through the current framework is presented in Box 2.

Box 2

A hypothetical example of the impact of inconsistency in the current regulatory framework [29]

A chemical company wishes to import a new chemical into Australia. They prepare the appropriate documentation and submit the notification complete with tests to NICNAS.

The Department of the Environment reviews the information and prepares advice for NICNAS. NICNAS finalises the report, seeks agreement on the outcome with the notifier, and publishes the report.

The report outlines that the chemical is of significant environmental concern based on the hazards of the chemical and the potential for environmental exposure. The report recommends that:

"Industry should comply with Commonwealth and state and territory legislation, and implement measures to ensure risks to the environment from releases of the chemical are not unreasonable. State and territory governments should monitor compliance" [30]

States and territories review the report and recommendation, and decide on an appropriate response for their jurisdiction.

For example, Jurisdiction A has a high level of industrial activity, high population density around the industrial areas and the chemical of concern is known to be used by a company in this area. Jurisdiction B has a small number of industrial sites, a lower population separate from the industrial area and the chemical is not likely to currently be used.

Jurisdiction A takes a stringent approach to risk management with highly prescriptive risk management requirements and an effective compliance and enforcement operation.

Jurisdiction B decides not to focus resourcing on this particular chemical.

In both jurisdictions, the chemical's level of concern to the environment remains the same. However, both jurisdictions have taken different approaches to managing the risks of the chemicals. The different approaches may not necessarily be an immediate issue, as they are based on current trends in the use of the chemical.

After five years, the chemical in listed on the Australian Inventory of Chemicals Substances (AICS). Once on the AICS, anyone can import the chemical to use for its assessed purpose. The chemical is now used by a different business in Jurisdiction B, but no one is aware of this and no risk management response is in place.

[30] Based on recommendations provided in Priority Existing Chemical reports. NICNAS are limited to make more specific risk management recommendations as each state and territory has different regulations and different infrastructure for risk management. There are currently no agreed and nationally implementable risk management arrangements.

The business is also unaware of the risk management requirements that Jurisdiction A is using, and assumes that releasing the chemical to the environment is not necessarily a problem. This results in environmental contamination that needs to be remediated.

Duplication in the system can also be an issue for businesses if both Jurisdiction A and B decide to take action but do so differently. For example, if they both prescribe different risk management requirements then a business operating in both jurisdictions would have to comply with both requirements, doubling their reporting and compliance efforts.

Filling the regulatory gap by setting standard risk management requirements will enable NICNAS to make focussed risk management recommendations, and provide a single point of reference for both governments and industry to directly reference that would be applicable now and in the future.

3.2.3 Australia must meet requirements under international obligations

Australia has a number of obligations to regulate chemical environmental risks under international law. These include Council Decisions produced under the Organisation for Economic Cooperation and Development (OECD) Chemicals Programme, the Stockholm Convention on Persistent Organic Pollutants, the Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade, the Minamata Convention on Mercury, and the Montreal Protocol on Substances that Deplete the Ozone Layer. Please refer to Appendix F for further details.

3.3 Summary

Industrial chemicals are used every day by everyone in a wide range of products and a range of uses including plastics and rubbers, paints, fuels, manufacturing, mining, household products, toiletries and cosmetics.

Some chemicals are harmful to the environment. If they are not managed appropriately, they may damage the environment. Historical examples of environmental contamination indicate that remediating sites can take decades, cost hundreds of millions of dollars and impact the community through reduced access to resources.

While the regulatory framework for chemicals has improved over the last two decades, the Australian regulatory framework for the management of risks to the environment from industrial chemical use remains complex. It is duplicative, nationally inconsistent, ineffective and inefficient. The key gap in the regulatory framework for environmental risk management of industrial chemicals is the lack of an institutional mechanism to coordinate the implementation of NICNAS's environmental recommendations by the states and territories.There are also information failures with the key gap being lack of knowledge of the environmental impacts of chemicals, both by businesses and the community. This results in negative impacts on the environment and community, and additional costs to businesses.

4 OBJECTIVES OF GOVERNMENT ACTION

The objectives of government action have been designed to address the problems associated with the current environmental chemicals management framework. The management of environmental risks from industrial chemicals across jurisdictions is fragmented and inefficient, and less effective than other chemical risk management regimes, such as workplace health and safety and public health. The overarching objectives of the reforms that address these problems are outlined in Box 3.

Box 3

Overarching Objectives

- To achieve better protection of the environment through improved management of the environmental risks posed by industrial chemicals
- To provide a nationally consistent, transparent and predictable approach for environmental risk management of industrial chemicals to governments, industry and the community

During the consultation process, a number of refinements to the chemical reforms were identified. The refinements to the reforms have been guided by the overarching objective and the following principles:

- Administration and compliance costs, both for government and industry, are kept as low as possible, and are appropriate for the scope of the regulation.
- The standard setting process should integrate smoothly with the NICNAS risk assessment process and relate appropriately to the other related risk-management frameworks (e.g. poisons scheduling, workplace health and safety, and dangerous goods transport).
- Implementation of the standards within jurisdictions should readily integrate with other existing jurisdictional processes, such as environmental licensing or hazardous waste regulation.
- The process and its outcomes should be as transparent and predictable as possible for industry and the community.
- The reform should generate positive outcomes for business by providing greater consistency across jurisdictions.

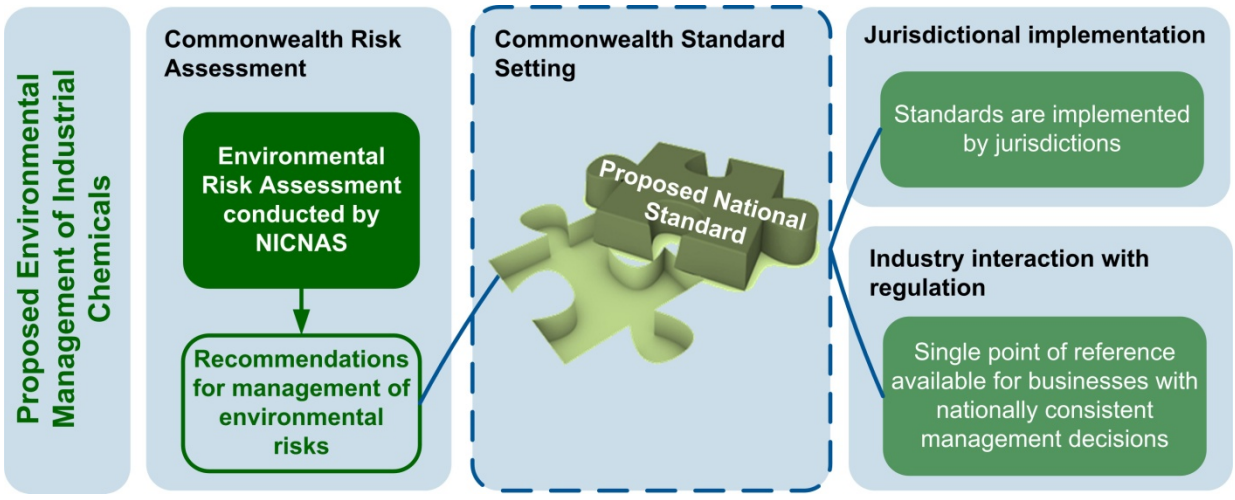
5 STATEMENT OF OPTIONS FOR ACTION

In order to address the objectives of the reforms and the principles outlined in Chapter 4, refinements have been made to the proposed options relative to those in the Consultation RIS. The options proposed establish arrangements equivalent to those that operate in the other sectors such as poison scheduling, transport and workplace health and safety and align with international practices for environmental risk management.

The principal area of policy refinement relates to how the 'standard-setting body' as described in the Consultation RIS would make decisions on risk management. The Consultation RIS suggested that the standard-setting body would translate high level environmental risk management recommendations from NICNAS into practical risk management actions by making individual decisions on a case by case basis.

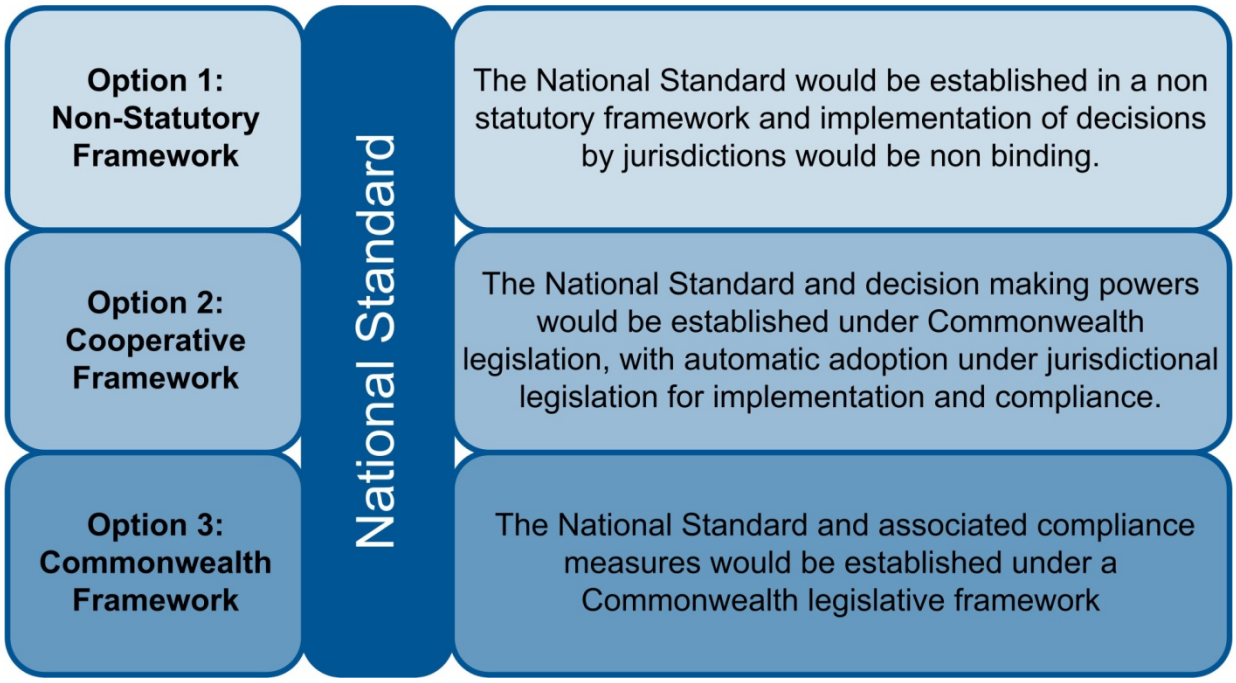
The refined approach is to develop a National Standard for the environmental risk management of industrial chemicals, further discussed in Section 5.1. A National Standard approach to environmental risk management of industrial chemicals is proposed to be the foundation for any of the proposed options, except the base case where current environmental risk management arrangements will remain unchanged. This will provide jurisdictions with one decision on required environmental risk management outcomes and will assist industry by having a nationally consistent approach (Figure 5-1).

Figure 5-1: Proposed framework for the environmental management of industrial chemicals



The three options for reform are differentiated in the same manner as those proposed in the Consultation RIS. However, the options have been refined to incorporate the Standard approach. It is proposed that this would be underpinned by a legislative instrument for Option 2 and Option 3, or via a non-statutory approach under Option 1.

Incorporating the Standard approach into each of the options is therefore an evolution of the work in the Consultation RIS and does not change the fundamental nature of the options presented in this RIS. The following sections outline the National Standard and the three options to amend the current regulatory arrangements. These options are:



5.1 The National Standard

A National Standard approach to environmental risk management of industrial chemicals is proposed, which is equivalent to frameworks already in place such as the management of industrial chemical risks to human health (see Section 3.2.2).

In this context the Standard refers to a mechanism by which a Decision Maker or delegate can 'schedule' or assign industrial chemicals to an established set of required risk management actions based on the chemical's level of concern[31]. This is to ensure that there are nationally consistent risk management outcomes.

The final National Standard will be developed and refined in consultation with stakeholders from government, industry and the community should the progression of one of Options 1 to 3 be agreed to by governments. Development of the Standard will include consideration of core principles driving the National Standard concept, and determining risk management outcomes and the required characteristics for each category, class or schedule of chemicals. The core principles of the National Standard are outlined in Box 4.

Box 4

Five core principles of the National Standard

The National Standard will:

1. assist in achieving protection of the environment though improved risk management of industrial chemicals
2. provide government, industry and the community with streamlined, transparent and consistent approaches to environmental risk management of industrial chemicals
3. categorise or classify chemicals based on their level of concern to the environment, taking into consideration environmental risks, inherent hazard characteristics and relevant socio-economic aspects
4. have risk management actions that are outcomes-based which are defined, yet flexible and publicly available.
5. provide opportunities for consultation on proposed risk management approaches, if required

5.1.1 Expected advantages of a National Standard

The National Standard has been designed to address the two overarching objectives of the reforms; namely to increase environmental protection and to provide a streamlined, efficient and effective framework for government, business and the community for environmental risk management of industrial chemicals.

[31] The level of concern incorporates consideration of a chemical's environmental risks, inherent hazard characteristics and any relevant socio-economic aspects to its use in Australia.

Some of the design features of the National Standard include:

- Uniformity across Australia of environmental risk management outcomes for industrial chemicals for ease of implementation and increased environmental protection
- Upfront development of the Standard to ensure greater transparency, predictability, certainty and consistency for industry and the community
- Alignment with international standards where appropriate, to inform the development of the National Standard
- A streamlined mechanism to address the increased number of existing chemicals that are likely to undergo risk assessments
- Alignment of processes for environmental scheduling to integrate with existing timeframes for NICNAS risk assessments, where possible, or follows seamlessly without imposing lengthy time burdens on industry
- An outcomes-based risk management approach to encourage continued innovation in environmental protection and also enable industry to keep costs related to risk management as low as possible
- Ensuring that scheduled decisions are easily accessible and searchable to enable businesses to make informed decisions
- Enabling the accelerated scheduling of low concern chemicals to ensure that an expert body and Decisions Maker's time is used more efficiently, focusing on chemicals of higher concern to the environment
- Potential for development of self assessment tools for industry leading to informed decision making and incentives to seek out 'greener' options

The benefits of the National Standard are explained further in Chapter 6: Impact Analysis.

5.1.2 Processes under the National Standard

During an industrial chemical risk assessment conducted by NICNAS, a recommendation is expected to be made to the Decision Maker under the National Standard as to the most appropriate categorisation and risk management actions for the chemical, based on its environmental risks and hazards.

The proposed scheduling process is outlined in Figure 5-2. For further information refer to Appendix G. Where possible, the Department of the Environment will work with NICNAS to align processes to ensure that the environmental risk management decision making process integrates with the existing timeframes or follows seamlessly whilst limiting time burdens on industry.

Appropriate timeframes will be determined during consultation with governments, industry and the community around implementation and may be dependent on the level of advice and consultation requested or required during the decision making process.

As the National Standard will have pre-defined risk management outcomes appropriate to the level of concern of a chemical, timeframes for decision making are expected to be minimal. As the National Standard will be transparent and predictable, risk management decisions may be anticipated prior to chemical notification and this will also streamline the process.

Figure 5-2: Proposed scheduling process under the National Standard

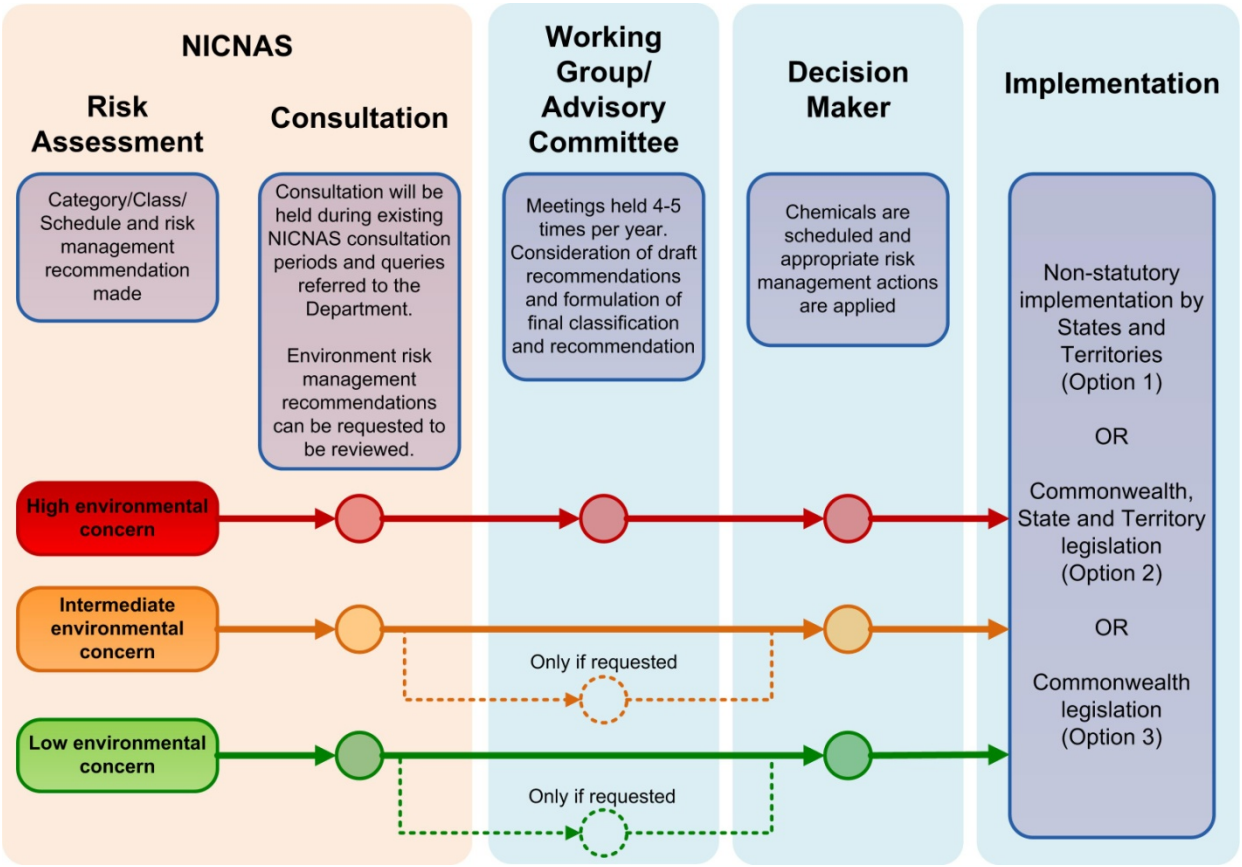
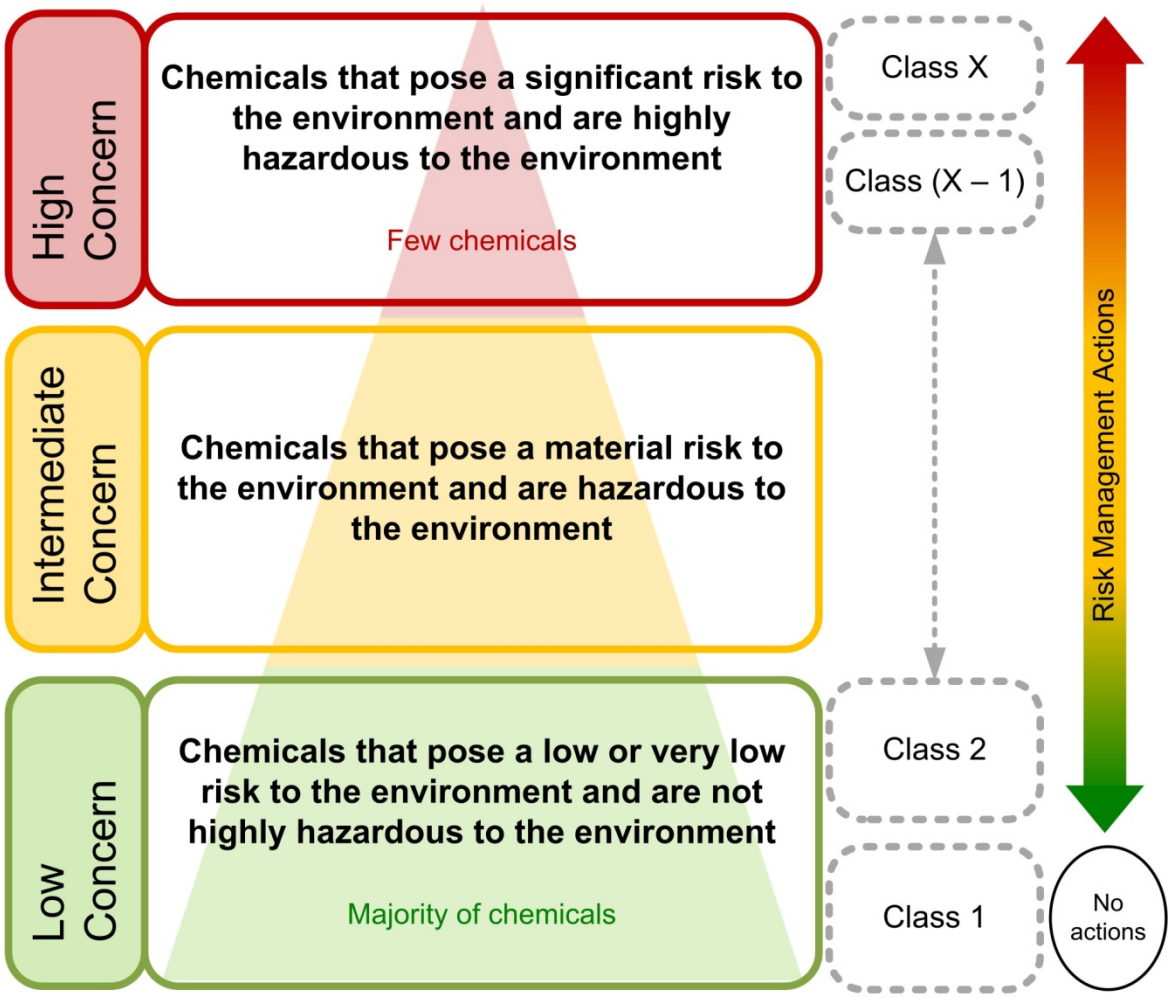


Figure 5-3 provides a high level outline of the proposed National Standard involving three primary categories of concern – High, Intermediate and Low Concern. The majority of chemicals are expected to fall in the Low Concern category where limited or no risk management actions are required. Few chemicals are expected to fall into the High Concern category. The percentages of chemicals assessed each year that are expected to fall into each concern category are outlined in Appendix H.

Figure 5-3: Conceptualisation of the National Standard[32]



NB: Concern Categories may be further broken down into a number of Classes or Schedules to allow for greater flexibility in the defined risk management actions.

[32] The National Standard will be further developed in consultation with stakeholders should one of Options 1 to 3 be agreed to by governments.

5.2 The Options for Action

In order to establish the proposed National Standard to strengthen the efficiency and effectiveness of the regulatory framework for the environmental risk management of industrial chemicals, three mechanisms for implementation are proposed. These implementation options build from the base case and include a non-statutory approach, a cooperative approach and a system fully implemented by the Commonwealth.

In all options, environmental risk management decision would be scheduled in accordance with the National Standard to ensure effective, transparent and consistent environmental risk management. However, as described in Figure 5-4 there are differences in the following areas:

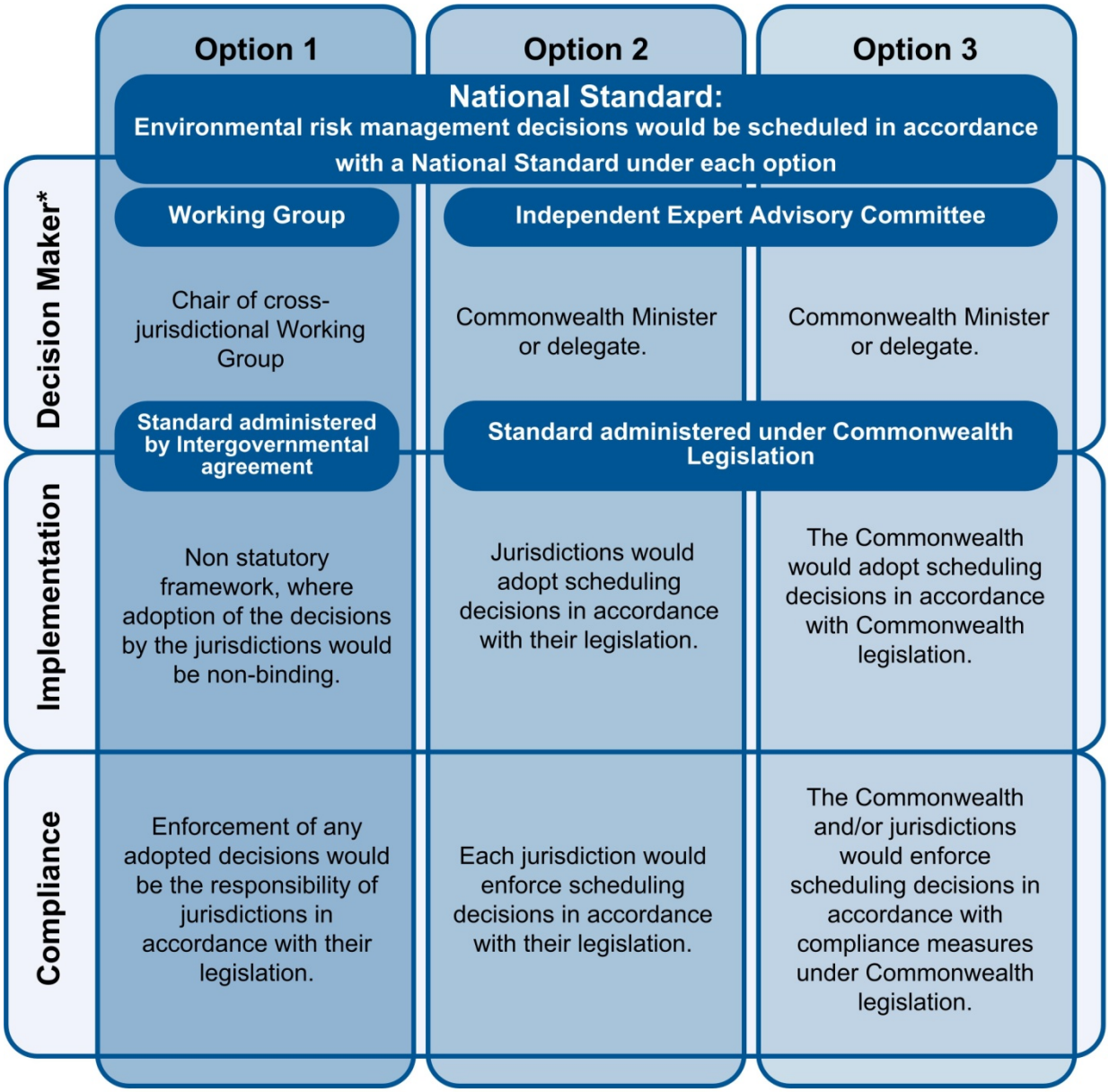
- The Decision Maker and the process by which decisions are made including associated expert bodies;
- Implementation in terms of how the framework for adoption of decisions would be established
- Responsibility for compliance and enforcement of decisions.

Under all options, industrial chemicals, both existing and new, would continue to be assessed in accordance with the ICNA Act and an environmental risk management recommendation would be made. Consistent with the Productivity Commission recommendations, the risk management of industrial chemicals would be a separate decision making framework to the existing NICNAS risk assessment framework. However, the processes would be integrated. There is no intent in any of the options to reconsider the hazard assessment, exposure assessment and risk characterisation conducted by the NICNAS.

All options include the upfront development of the National Standard, including the criteria for categorisation of chemicals. This would be a collaborative process between jurisdictions, in consultation with industry and the community.

It is proposed that all high concern chemicals would be reviewed by the Working Group (Option 1) or the Advisory Committee (Options 2 and 3). Low and intermediate concern chemicals would only be considered by these experts if the notifier requests a review. If no review is requested, the risk management recommendation would be streamlined to the Decision Maker for scheduling.

Figure 5-4: Comparison of the three options for environmental risk management of industrial chemicals



*responsible for making scheduling decisions under the National Standard

5.2.1 Base Case – Business-as-Usual

The base case assumes that all levels of government maintain the current framework for managing environmental risks associated with the handling, storage, use and disposal of industrial chemicals. In other words, the base case involves a continuation of the status quo. This is the baseline against which the three proposed options will be compared.

The base-case includes:

- NICNAS continuing to develop its high level environmental risk management recommendations as part of the risk assessment process
- environmental risk management recommendations implemented by the states and territories in accordance with existing frameworks

- maintaining the current efforts by jurisdictions to improve the interface between NICNAS and state and territory environmental agencies, through existing frameworks such as National Chemical Environmental Management Framework (NChEM).

The current regulatory arrangements for environmental risk management of industrial chemicals are described in detail in Section 3.2.2 and Appendix F.

5.2.2 Option 1 – Non-statutory framework

Option 1
The National Standard would be established in a non-statutory framework and implementation of decisions by jurisdictions would be non-binding.

Under Option 1, the National Standard, the process for making risk management decisions and implementation of risk management decisions, would not be underpinned by a statutory decision making framework. Environmental risk management decisions made under the National Standard would be non-binding on jurisdictions.

The primary features of this option would include the establishment of an Intergovernmental Agreement or a Ministerial Agreement between environment ministers which would include:

- establishment of the National Standard.
- establishing and outlining the roles and responsibilities of the working group and the Decision Maker.
    - The working group is proposed to be comprised of Commonwealth, state and territory representatives to review the NICNAS recommendations and make further recommendations if requested, based on the National Standard.
    - The Decision Maker, likely to be the chair of the working group as agreed by the jurisdictions, would consider advice from the working group and make a decision for scheduling.
- establish the framework by which jurisdictions would review and implement the decisions using appropriate mechanisms or maintain their status quo.

5.2.3 Option 2 – Cooperative framework

Option 2
The National Standard and decision making powers would be established under Commonwealth legislation, with jurisdictional legislation for implementation and compliance.

Under Option 2, the National Standard would be established under Commonwealth legislation to assist in national consistency. In line with the current responsibilities of states and territories for environmental risk management, each jurisdiction would adopt and enforce scheduling decisions in accordance with their legislative frameworks.

The primary features of this option would include:

- establishment of the National Standard in Commonwealth legislation
- establishing and outlining the roles and responsibilities of the advisory body and the Decision Maker.
    - The advisory body is proposed to be made up of individuals with relevant expertise with the environmental management of chemicals, including specific disciplines such as environmental toxicology, environmental risk management and chemistry.
    - The Decision Maker who is likely to be a delegate of the Commonwealth Minister for the Environment would consider advice from the advisory body and make a decision for scheduling.
- Decisions on environmental risk management actions would be made under new Commonwealth legislation, with states and territories automatically adopting and implementing decisions under their legislation for matters which they are responsible. The Commonwealth would only implement those components of the decision appropriate to its responsibilities.

5.2.4 Option 3 – Commonwealth framework

Option 3
The National Standard and associated compliance measures would be established under a Commonwealth legislative framework.

Under Option 3, Commonwealth legislation would be developed that establishes a National Standard. The new Commonwealth legislation will also specify compliance and enforcement measures to be applied nationally and it is likely that jurisdictional enforcement bodies and officials could be given relevant compliance and enforcement powers under the Commonwealth legislation.

Much like Option 2 the process for making risk management decisions will be underpinned by statutory decision making framework. However, under Option 3 a new national regulator would be established to enforce decisions in accordance with Commonwealth legislation.

The primary features of this option would include:

- establishment of the National Standard in Commonwealth legislation
- establishing and outlining the roles and responsibilities of the advisory body and the Decision Maker.
    - The advisory body is proposed to be made up of individuals with relevant expertise with the environmental management of chemicals, including specific disciplines such as environmental toxicology, environmental risk management and chemistry.
    - The Decision Maker who is likely to be a delegate of the Commonwealth Minister for the Environment would consider advice from the advisory body and make a decision for scheduling.
- establishment of a national regulator for compliance and enforcement

5.3 International Consistency

The proposed approach is consistent with the objectives of the Strategic Approach to International Chemicals Management (SAICM) and similar to approaches to environmental risk management of industrial chemicals adopted in other advanced economies. In particular, the National Standard aims to prioritise pollution prevention and minimise chemical risks to the environment while providing a transparent, efficient and effective approach to environmental risk management of industrial chemicals.

One of the overarching objectives of SAICM outlined in its Policy Strategy[33] is Risk Reduction with aims including the:

- minimisation of chemical risks to the environment and human health

[33] Strategic Approach to International Chemicals Management (SAICM) website

- implementing transparent, comprehensive, efficient and effective risk management strategies based on scientific understanding
- prioritising protection of vulnerable ecosystems
- ensuring chemicals with unreasonable and unmanageable risks are no longer produced or used
- prioritisation of pollution prevention
- application of a precautionary approach to chemicals management.

Many advanced economies have worked towards achieving the objectives of SAICM. Canada, the European Union, the United States of America and Japan have approaches to environmental risk management of industrial chemicals that mirror the objectives of SAICM and some, along with Australia, contribute to the United Nations Environment Programme (UNEP) and SAICM. Details of the approaches to environmental risk management of industrial chemicals of other advanced economies are detailed in Appendix I.

In October 2014, the Council of Australian Governments agreed to explore adopting, as a general principle, trusted international standards or risk assessment processes for systems, services and products, unless it can be demonstrated that there is good reason not to.

International standards in the area of sound chemicals management, such as SAICM, guidance from the OECD and ISO 31000:2009 (Risk management – principles and guidelines), outline principles and generic guidelines for risk management approaches. They are not intended to promote uniformity of risk management across organisations or governments.

The proposed options are aligned with international processes and relevant international environmental standards would be considered and utilised in the implementation stage of the National Standard.

The international standard approaches identify the importance of risk management plans and frameworks being designed and implemented to take into account the varying needs of the particular country. The importance for countries to develop and implement their own chemical frameworks is fundamentally due to differences between jurisdictions internationally. These differences include both physical environmental variations between countries and differences in policy settings and management infrastructure.

Australia, like other countries, has a unique environment and risk management actions need to be tailored to meet the specific risks for a particular location. Risks from industrial chemical use not only vary between countries, but also vary between cities/towns. In particular, environmental risk assessments consider a range of location specific exposure information, including population, waste water and sewage treatment capabilities and volumes of water in receiving environments such as rivers, ponds and lakes. Australia has a naturally dry environment and therefore the risk assessment methods used in Australia account for creeks having the potential to be composed entirely of effluent from industry. It should also be noted

that NICNAS already considers hazard assessments produced overseas and uses these assessments to inform the risk assessment (see Appendix A for definitions of hazard and risk).

Risk assessment recommendations specific for the Australian context will inform the risk management decisions, which will also be tailored to ensure states and territories have the infrastructure available for appropriate protection of the environment.

As described above, the proposed options for environmental risk management of industrial chemicals in Australia factor in these considerations and align with and incorporate the guidance and principles outlined in international standards.

5.4 Summary of Options for Action

As identified in the 2008 Productivity Commission Report, the base case has not delivered effective, nationally consistent and timely decisions to protect the environment that can be readily adopted and implemented within all jurisdictions. If the decision was made to continue the current framework, the identified weaknesses that have discouraged the national uptake of environmental risk management decisions would continue. This would therefore not meet the objectives of the proposed reforms as there would still be:

- an increased risk to the environment and potential adverse impacts to human health
- no mechanism for all jurisdictions to agree and implement national decisions on environmental risk management.

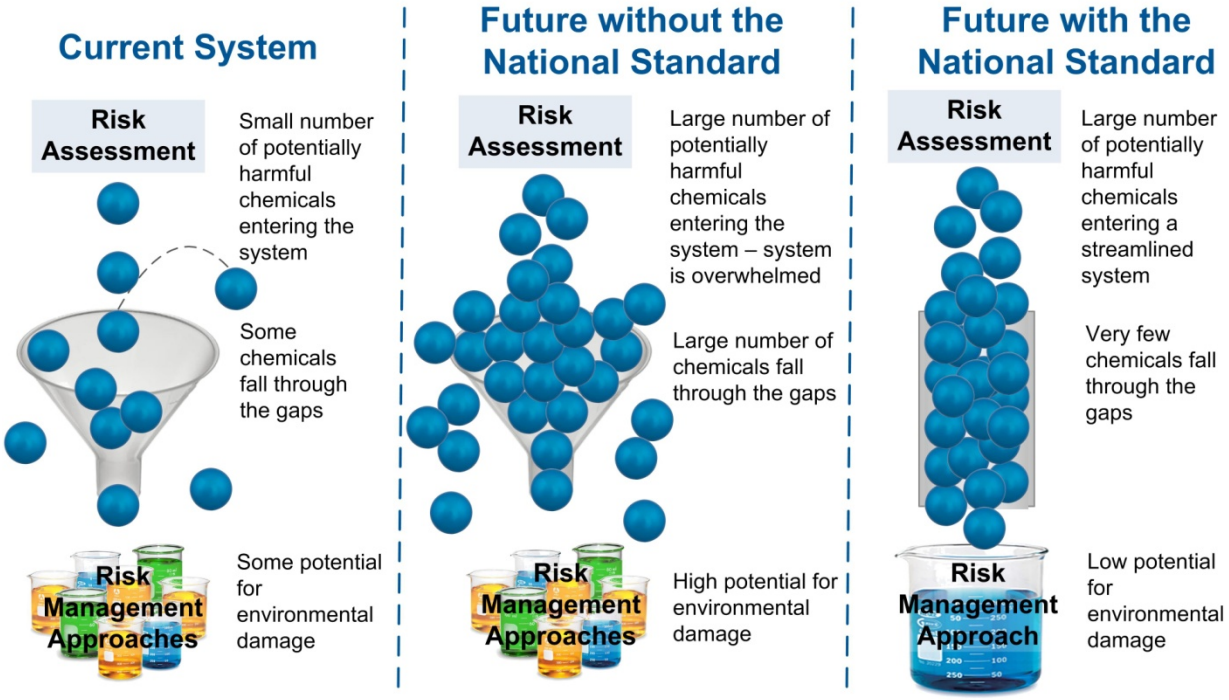
A further consideration is the likely increase in the number of new and existing chemicals that undergo a NICNAS risk assessment. This is likely to further increase the pressure on the fragmented and inefficient current framework (Figure 5-5 *infra*).

The proposed options to address the identified problems in the base case have been refined to each include the development of a National Standard approach to the environmental risk management of industrial chemicals.

The proposed options are differentiated in the same manner as the Consultation RIS and include a non-statutory framework, a cooperative model and a framework fully implemented by the Commonwealth.

In addition to the intention of achieving better protection of the environment through risk management of industrial chemicals, a Standard approach would provide greater transparency, predictability, certainty and consistency for industry and the community.

Figure 5-5: Environmental risk management of industrial chemicals in Australia



6 IMPACT ANALYSIS

An impact analysis seeks to identify and, where possible, quantify the costs and benefits of each of the options relative to the base case or status quo. The purpose of the impact analysis is to provide stakeholders with an indication of the likely impacts that would arise from implementing the options, and provide decision makers with an indication of the option that is likely to deliver the greatest benefit to the community as a whole.

In summary, the impact analysis indicates that there is likely to be a net benefit to the community as a result of implementing any of the options relative to the base case (Table 6.1).

- Option 2 is estimated to be the least costly option in order to deliver the described benefits.
- Compared to Option 2, Option 1 is estimated to be more costly to implement and only achieve some of the benefits of nationally consistent risk management for environmental protection and reduced burden on industry.
- Compared to Option 2, Option 3 is more costly to implement because it involves establishing new national legislation and a regulator, with no additional benefits.

Table 6-1: Estimated NPV costs over 10 years for each of the proposed options

	Option 1	Option 2	Option 3
	$million	$million	$million
Impact on the community	109	181	181
Impact on industry	-37	-59	-60
Impact on government	-15	-10	-16
Total net benefit	**57**	**112**	**105**

Note: Numbers may include rounding errors.

6.1 Methodology

The proposed National Standard would change the decision making and governance framework for environmental risk management of industrial chemicals from a fragmented inconsistent system to a nationally consistent approach. The Standard would result in consistent environmental risk management decisions which may change the way that industrial chemicals are regulated. It is these future regulatory requirements that are expected to have an impact on businesses, government, the community and the environment.

A cost benefit analysis was undertaken by the Centre for International Economics to update the impact analysis presented in the Consultation RIS based on the refinements to the options including the National Standard approach. A number of limitations to the data were identified that make it difficult to determine the potential impacts on business and the community from the proposed options, predict the impacts over the life of regulation and monetise the impacts by business sector, by jurisdiction and nationally. Appendix J has further discussion on the data limitations. These factors result in a greater than usual level of uncertainty in conducting a cost benefit analysis for regulatory change.

To be able to quantify aspects of the proposed reforms that are not easily monetised, or extrapolated to a national scale over a large number of chemicals, two approaches were used to inform the conservative estimate presented below.

The two approaches were:

- A top down approach — this approach focused on looking at the overall size of the problem the proposal is trying to solve and then considering to what extent the Standard and associated processes will address this problem.
- A bottom up approach — this approach focused on establishing the net benefits/costs of changes to the status quo on an individual chemical basis and extrapolating across all chemicals assessed using the Standard every year

The top down approach focused on determining the potential benefits from the National Standard including avoided contamination costs, avoided public health costs and increased national regulatory harmonisation for business. Case studies from the bottom up approach were used to inform the scaling of the top down approach by establishing the benefits and costs on an individual chemical basis. The top down approach is considered to be a conservative method of estimating the impact of the reforms and is based on the best available information for the costs of industrial chemicals on the community.

In both of these approaches, the overall result was a significant net benefit to the community. However, due to the uncertainty in being able to accurately characterise all the chemicals that will be considered under the Standard as noted previously, it is considered that the bottom up approach has significant limitations.

The following impact analysis will be presented using a combination of monetised costs, quantified but not monetised costs, and qualitative but not quantified or monetised benefits. This will enable decision makers to consider the best available information.

6.1.1 Baseline

There are thousands of chemicals in use in Australia, each used and regulated differently across the states and territories. Therefore, the baseline for the impact analysis differs depending on which industrial chemical is being considered, as well as across jurisdictions. For some chemicals there will be regulation in place in some jurisdictions but not others, and for other chemicals there is no regulation in place.

Currently, state and territory environmental risk managers regulate specific sites where chemicals are used through the environment protection provisions in legislation, rather than regulating specific chemicals for all sites that use them. There is currently no systematic process for considering environmental risk management recommendations presented by NICNAS, with environmental risk managers responding to environmental incidents as they emerge. This suggests that the following two baselines are relevant:

- For most new chemicals, the most relevant base case is that the proposed nationally consistent framework and the associated processes under the National Standard will be an

additional process that is not currently systematically undertaken – a uniformly '*no regulation*' base case.

- For existing chemicals that are known to be causing environmental problems, the relevant base case is '*fragmented regulation'*. That is, in the absence of a nationally consistent approach, state and territory environmental risk managers would undertake their own assessment and implement risk management actions. However, where the environmental impacts of existing chemicals are not currently known, the '*no regulation*' base case would be relevant.

6.2 Impact on the community

There is likely to be a significant benefit to the community from implementing this reform to the environmental risk management framework, from avoided site contaminated and associated public health impacts.

The economic and social impact of environmental harm caused by certain industrial chemicals is well known and documented as described in Box 5. There are examples where the remediation costs of one site alone are estimated to be $200 million.

Box 5

Economic impact of contaminated sites in Australia [34]

The number of contaminated sites in Australia is estimated to be around 80,000.

The Cooperative Research Centre for Contamination Assessment and Remediation of the Environment (CRC CARE) has estimated that the total cost of remediating known and potential contaminated sites in Australia at $3 to 4 billion.

The clean-up cost of dioxin contaminated sediments in Sydney Harbour alone is estimated at around $200 million.

In addition there are four major contaminated sites in NSW with estimated total remediation costs of $410 million to $540 million.

The cost of site inspections alone is significant with costs ranging from $20,000 for preliminary site investigations to more than $450,000 for more detailed investigations at complex sites. It is estimated that 1500 to 3000 detailed site assessments are required each year which could be at a cost of up to $135 million.

There are also expected to be health benefits to society from improved management of chemicals in the environment. Occupational, Health and Safety (OHS) regulations manage the risks to human health at the workplace. However, there are expected to be public health benefits from exposure outside the workplace.

[34] NSW EPA (2013), Regulatory Impact Statement – *proposed Contaminated Land Management Regulation* 2013.

Due to a lack of a knowledge-based, preventive approach to risk management throughout a chemical's life cycle, there are significant risks to human health and ecosystems, and associated economic costs for individuals, business and the community.

To put this in perspective, the World Health Organisation reported that globally in 2004, 4.9 million deaths (8.3% of the global total of deaths) and 86 million Disability-Adjusted Life Years (DALYs) (5.7% of the global total of DALYs) were attributable to environmental exposure and management of selected chemicals with available data.[35]

In the case of the European Union, the analysis on the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) program indicates that the net benefit of regulation of chemicals from an environmental and human health perspective is in the order of €150-500 million after 10 years of operation (Box 6).

Box 6

Findings from the European Union Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) programme[36]

REACH requires that manufacturers and importers of chemicals register their chemicals, that registrations are evaluated by authorities, that certain substances of very high concern are authorised and that restrictions are imposed in cases where risks cannot be adequately controlled by other means. REACH would replace and consolidate, into one single regulation, large parts of the chemicals legislation.

Numerous studies have been conducted by the Commission, by national authorities and various stakeholders on the possible impact of REACH. The analysis identified a number of costs that are currently incurred due to high level of chemicals in the environment including higher costs of:

- purification of drinking water
- disposal of dredged sediment and incineration of sewage sludge instead of disposing it on farmlands
- sewage treatment - In some instances larger sewage treatment plants are required to obtain room for excess nitrification capacity due to toxic effects of chemicals in sewage water

The costs of measures already implemented for mitigating the impact of releases were estimated to be up to €7 billion per year in 2005 for only those cases included in the study.

The analysis presented that with the implementation of REACH there was the opportunity to avoid certain costs in the future, for example for contaminated land, water treatment and human health impacts. REACH was assumed to be able to reduce these costs by 10 per cent which resulted in estimated benefits of between €150-500 million in year 2017 (approximately A$215-A$715 million in that year assuming €1 = A$1.43 as at November 2014).

[35] UNEP (2013) *Report on the Costs of Inaction on the Sound Management of Chemicals.*

[36] DHI Water and Environment (2005), *The impact of REACH on the environment and human health*

Under all options, implementation of the National Standard is likely to result in increased protection of the environment when compared to the base case. The extent to which this is achieved is dependent on the adoption of risk management decisions and the level of compliance; or in other words, on the extent to which the proposed reforms change the way chemicals are regulated. As for other types of impacts, this also depends on the baseline for each chemical.

Increased environmental protection is expected to be achieved through:

- risk management for chemicals that would not otherwise have had them (that is, compared against the 'no regulation' baseline); and
- more effective and consistent risk management undertaken (that is, compared to the 'fragmented regulation' baseline).

The decreased risk of environmental harm will depend on how effectively the reforms reduce the probability of environmental 'incidents' or sites becoming contaminated over time. The Standard is intended to result in management decisions that are tailored more accurately to the actual risk posed to the environment by a chemical. The probability of environmental incidents or sites becoming contaminated over time will differ between different types of chemicals, depending on the concern rating assumed for the chemical.

To be able to provide an estimate of the likely benefits of changes to the framework for environmental risk management, a top down approach was undertaken that includes: potential future site remediation costs avoided and potential public health benefits extrapolated from a European Union study into REACH.

Based on known examples of site contamination, it is estimated that the benefit from cost avoided from this type of environmental incident could be $92 million (net present value over ten years). In addition, the community is likely to benefit from decreased risk of environmental exposure to industrial chemicals that have the potential to significantly impact on human health, in the order of $172 million (net present value over ten years). However, for the purposes of this analysis, the conservative mid-point estimates of $69 million and $112 million have been included.

Table 6-2: Present value benefits of reduced remediation costs and public health exposure costs

	Low estimate $ million	Mid-point $ million	High estimate $ million
Present value[a]			
Reduced remediation costs	46	69	92
Public health	52	112	172
Total	**98**	**181**	**264**

[a] Estimated over a ten year period using a discount rate of 7 per cent, assuming the Standard is implemented from the third year onwards. Note: Numbers may include rounding errors.

Option 1 will establish a national schedule of environmental risk management actions and go some way towards protecting the environment and the Australian people by improving the efficiency of risk management actions for industrial chemicals that have the potential to cause environmental harm. However, as national decisions are non-binding, this approach could also maintain the current inconsistency in application of risk management actions for industrial chemicals thereby counteracting any effectiveness. It has been estimated that only 60% environmental risk management recommendations will be implemented under Option 1. Therefore, the estimated benefit to the community is lower than compared to the other options.

The benefits to the community are likely to be realised under Option 2 and 3 as the rate of adoption and implementation is expected to be higher under a legislative framework approach.

- Unlike Option 1, in Option 2 the process for making risk management decisions will be underpinned by a statutory decision making framework and all jurisdictions will agree to incorporate decisions into their legislative framework and ensure compliance. This approach has the potential to promote a consistent application of risk management actions nationally which would provide greater transparency, predictability and certainty for the community.
- Option 3 goes further than Option 2 in achieving not just a nationally agreed decision with a consistent environmental outcome, but also consistent nationwide implementation, including in regards to compliance and enforcement.

6.3 Impact on Industry

One of the key information gaps is quantitative data on the number of businesses that are using industrial chemicals, the types and volumes of industrial chemicals used and the existing risk management measures already in place. In the absence of this information, the following is a qualitative description of the potential impacts on business using individual examples rather than attempting to extrapolate this to the whole sector.

It is assumed that for the majority of chemicals scheduled under the Standard, businesses are likely to already be compliant as existing controls and work health and safety measures used by industry may already be sufficient to meet environmental risk management recommendations. The majority of chemicals for which industry may already be compliant include chemicals that are categorised as Low Concern and a portion of Intermediate Concern chemicals.

The introduction of the National Standard would impose a one off cost to industry in the form of staff time for businesses to educate themselves about the National Standard and the new regulatory arrangements. There would also be an expectation that for businesses that would need to meet new requirements, there would be an additional upfront training cost.

It is expected that the introduction of the Standard would increase the compliance costs for businesses operating in jurisdictions where risk management recommendations are not readily or consistently adopted by the jurisdiction in which they operate.

For existing chemicals, the costs/benefits from the proposed reforms depend on how the risk management actions imposed under the proposed reforms are different to those currently imposed by each jurisdiction. This could be either a benefit or a cost to industry. There may be some chemicals where additional compliance measures are required based on availability of new information about the potential hazards and risks to the environment.

Potential additional compliance costs may include:

- Purchase of materials or equipment to meet environmental risk recommendations
- Record keeping activities (staff time) to ensure documents are generated, current and stored according to legislative requirements
- Resources required to facilitate audits and inspections according to legislative requirements.

Box 7

Illustrative example of potential risk management recommendations under the National Standard - Perchloroethylene

Under the National Standard, once a chemical is scheduled it will have associated risk management actions based on its level of concern to the environment. For example using Perchloroethylene (Perc) as an illustrative example, a chemical with a similar hazard and risk profile may be subject to the following controls:

- DO NOT release the chemical to sewer
- DO NOT release the chemical directly to surface waters, storm water, soil or air
- Use chemical in a closed-loop system

The manufacture of Perc ceased in Australia in 1991 but it is still used as a cleaning solvent (as pure compound and chemical formulations), industrial solvent in product formulation, chemical reactant and analytical laboratory ingredient.

One method that business could choose to meet the illustrative requirements would be to change to an alternative chemical for dry cleaning. A study from the United States compared different technologies and provides an indication of potential associated costs. Hypothetically, it is estimated that to switch from Perc to non-chlorinated hydrocarbon cleaning would increase the cost to business by $1216 per year. This is primarily due to the increase in electricity required . This equates to a cost of $6470 in present value terms over 20 years (with a 7% discount rate). Of course, there may be other ways to meet the risk management requirements and industry is expected to choose the least costly action to meet the outcomes.

The clean-up costs associated with Perc contamination can be as high $10 million per site. As an example, it is assumed that each dry cleaning site has a probability of incurring such a clean-up cost after 20 years of 0.01. This implies the expected environmental benefit (avoided clean-up cost) of applying the Standard is around $27 600 in present value terms (using a discount rate of 7 per cent) per dry cleaner.

Therefore, on a per business basis as an illustrative example, the net benefit from the National Standard would be approximately $21,000 (net present value (NPV) over 20 years with a 7% discount rate). If this is extrapolated to 75% of the approximately 3600 dry cleaning business, the net present value of cost avoided would be approximately $57 million over the same period.

6.3.1 Advantages to industry as a result of increased national consistency

Currently, businesses may be subject to different regulatory requirements for the environmental risk management of industrial chemicals in each jurisdiction. One of the primary aims of the proposed options and the Standard is to provide greater consistency across jurisdictions so business is only required to adhere to one Standard. With better consistency, businesses operating in different jurisdictions will also benefit in terms of compliance costs and other savings such as lower administration and reporting costs.

It is expected that the Standard would be able to meet the aim of greater harmonisation that generally includes the following[37]:

- Lower compliance cost on business — fragmented regulatory arrangements can increase complexity and can lead to duplication of effort for businesses operating across state borders.
- Lower costs associated with administering multiple regulatory schemes — where each state and territory undertakes the same regulatory function separately, there is likely to be significant duplication of effort.
- Market fragmentation and the failure to capture the benefits from economies of scale — different regulatory regimes can have the effect of creating smaller markets as businesses and individuals focus their operation in a single jurisdiction, rather than looking to engage in a wider market.

6.3.2 Informed decisions and outcomes based actions undertaken by business

The Standard would allow for greater transparency, predictability and certainty for businesses as the various proposed risk management actions would be publicly available and based on an existing, known Standard. Thus the industry will be able to better understand and engage with the regulatory framework at an earlier stage.

With the provision of self-assessment tools, the Standard would allow industry to make informed judgements about likely outcomes of the risk management process *prior* to applying for assessment under NICNAS, and may in turn also provide an incentive to seek out 'greener' options.

[37] Victorian Competition and Efficiency Commission, *Part 1 — Strengthening Foundations for the Next Decade: An Inquiry into Victoria's regulatory framework*, A draft report for further consultation and input, February 2011, pp. 204-205.

In addition, the Standard is proposed to be outcomes based which is in accordance with the principle that: '*Regulation should have clearly identifiable outcomes and unless prescriptive requirements are unavoidable in order to ensure public safety in high-risk situations, performance-based requirements that specify outcomes rather than inputs or other prescriptive requirements should be used.'* [38]

This approach allows industry the flexibility to determine how best to meet the required environmental outcome for a particular chemical. It allows regulated entities to find the least cost solution to meeting the prescribed performance outcome and therefore also encourages innovation.

Feedback from industry to date has indicated their support for a nationally consistent approach to environmental risk management of industrial chemicals. They have also been supportive of a National Standard based on its ability to create a consistent and transparent approach to regulation for businesses.

6.3.3 Streamlined process and potential for reduced delay costs

Further benefits can flow from the development of the Standard if NICNAS considers the Standard during their chemical risk assessment process. The Standard is proposed to be used to allow NICNAS to publish a draft recommendation on which concern category the chemical should be assigned to and appropriate risk management outcomes, thereby creating efficiencies and facilitating integration between the assessment and risk management processes.

One advantage of the options is the potential benefit from reducing the delay costs that are incurred in bringing a chemical to the Australian market. In the current regulatory system, there is no national environmental risk management forum to which NICNAS can make targeted risk management recommendations. This can lead to uncertainty in assessment outcomes for both industry and NICNAS. There have been instances where NICNAS has had difficulty making appropriate environmental decisions in relation to certain chemicals where there is a level of environmental concern and the risk assessment has concluded that the long-term risk is unknown. In some circumstances, it has taken several years for these new chemical risk assessments to be completed, as additional data is collated by the chemical notifier to support the assessment. Some of these assessments have also resulted in the notifier reducing the import volume to ensure the assessment does not conclude that the chemical may pose an unreasonable risk to the environment.

This situation may be avoided with a National Standard as it should assist in providing transparency and certainty for the chemical industry. There is the potential that scheduling decisions and risk management actions could be estimated prior to the introduction of chemicals. This could allow industry to make conscious decisions about the chemicals they introduce into Australia, prepare for the potential risk management requirements, and predict the type of additional information to provide to NICNAS that may support the risk assessment.

[38] Council of Australian Governments, *Best Practice Regulation: A Guide for Ministerial Councils and National Standard Setting Bodies*, October 2007, p. 5.

Therefore, certainty in risk assessment and risk management outcomes for environmental risks could help reduce the costs related to delays in bringing a chemical to the Australian market.

6.3.4 Summary of net impact on industry

The impact on industry as a result of the proposed options will depend on the assessed level of concern to the environment of the industrial chemicals used and whether businesses are subject to changes in requirements for risk management. It is assumed that for the majority of chemicals scheduled under the Standard, businesses are likely to already be compliant as existing controls used by industry may already be sufficient to meet environmental risk management recommendations. These considerations are set against the background of the chemicals and plastics industry which has an estimated value of $33 billion in annual turnover.

However, it is expected that the introduction of the Standard would increase the compliance costs for businesses operating in jurisdictions where risk management recommendations are not readily or consistently adopted. These costs could be in the order of $59 million and $60 million (over 10 years in present value terms) for Options 2 and 3. The cost to industry is likely to be lower for Option 1 as it is less likely that risk management decisions will be adopted and implemented. Industry will also be subject to one-off upfront costs which will involve familiarisation with the new processes and training of staff to meet potential new risk management requirements.

The Standard is proposed to be outcomes based. This approach allows industry the flexibility to determine how best to meet the required environment outcome for a particular chemical. It allows regulated entities to find the least cost solution to meeting the prescribed performance outcome and therefore encourages innovation.

Fragmented regulatory arrangements can increase complexity and can lead to duplication of effort for businesses operating across borders. It is expected that industry would benefit from the establishment of a nationally consistent approach to environmental risk management from industrial chemicals due to lower administrative and compliance costs associated with adhering to one National Standard rather than up to eight different requirements across all jurisdictions. It is estimated that this could lead to a savings in the order of $3 million for business for Option 2 . This is likely to be lower for Option 1 as a lower level of national consistency of risk is expected and businesses could still be subject to different risk management and reporting requirements. This is also likely to be lower for Option 3 due to overlap between compliance activities for chemicals at the Commonwealth and state and territory levels (See duplication discussion in Section 6.4). This would result in businesses continuing to report multiple agencies which results in less time saved reporting to governments compared to Option 2.

The level of consistency in implementation of risk management recommendations expected from each option is considered to increase from Option 1 to Option 3. As the approach in Option 1 is that of non-binding national decisions, the uptake of risk management decisions by jurisdictions cannot be determined. There is the potential that industry will continue to be burdened by inconsistent implementation of risk management outcomes between jurisdictions.

Therefore, the benefit to industry from achieving national consistency for environmental risk management of industrial chemicals may not be as well recognised as under options 2 and 3. This will also decrease the ability of the Standard to provide a transparent decision making process.

Table 6-3: Total impact on business of proposed options (net present value over 10 years)

	Option 1 $million	Option 2 $million	Option 3 $million
Impact on industry			
Cost of understanding new framework	-4	-4	-4
Benefits of harmonisation	1.8	3.1	2.0
Cost of risk management actions	-35	-58	-58
Total impact on business	**-37**	**-59**	**-60**

Note: Numbers may include rounding errors.

6.4 Impact on Government

Implementing a National Standard will impose costs on the Commonwealth and state and territory governments as outlined in Table 6-4. These costs will include:

- the upfront costs associated with developing the National Standard
- the upfront costs associated with changes to the legislative and administrative arrangements necessary to implement the Standard
- ongoing costs associated with: functions of the Working Group (Option 1) or Advisory Committee (Option 2 and 3) and the Decision Maker
- compliance and enforcement costs.

In general, the costs associated with developing and implementing the Standard are relatively modest and are mostly incurred by the Commonwealth Government. Option 2 is the least cost option for implementation at $10 million (NPV over 10 years). Option 1 and 3 are costed at $15 million and $16 million respectively.

Although the (net) benefits from changes to the way the environmental risks associated with industrial chemicals are managed are not easily quantified, it is highly likely that they will outweigh the costs associated with developing and implementing the Standard. Indeed, the illustrative examples investigated suggest that the benefits from just a few chemicals could potentially outweigh the costs of developing the Standard on their own.

The main difference in the costs is determined by the required level of involvement of the state, territory and Commonwealth governments to implement the Standard under the three options. The increase in costs of Option 3 also reflects the potential for regulatory duplication and associated costs of establishing a new Commonwealth regulator. The assumptions that support these cost estimates are at Appendix J.

Table 6-4: Estimated NPV costs over 10 years of developing and administering the National Standard[39]

	Option 1	Option 2	Option 3
	$'000	$'000	$'000
Commonwealth Government			
National Standard development	613	613	613
Legislative and administrative changes	1227	1739	6523
Ongoing National Standard processes	2049	2751	4450
Total - Commonwealth Government	3889	5103	11,586
State and territory governments			
National Standard development	203	203	203
Legislative and administrative changes	1715	1172	703
Ongoing National Standard processes	9293	3653	3526
Total - state and territory Governments	11,211	5029	4432
Total	**15,100**	**10,132**	**16,019**

Note: Numbers may include rounding errors.

The existence of a Standard is expected to minimise the need to negotiate and prepare risk management actions for each chemical on a case-by-case basis. This would streamline the process, resulting in time savings as well as fewer resources used to make a decision, resulting in further cost savings.

For example a key ongoing cost to government under Option 1 is staff time required to facilitate the decision making process under the National Standard. This includes the time required by a Decision Maker or their delegate, operation costs for staff working on a secretariat of the National Standard, and jurisdictional resourcing of a Working Group for reviewing and commenting on risk management recommendations, as required. There would also be additional administrative costs to adopt each scheduling decision, potentially through legislation on a case by case basis.

In contrast, under Option 2 and 3, the staffing requirements for jurisdictions is less than for Option 1 as the framework would establish an Advisory Committee (as described in Appendix I) rather than a Working Group composed of state and territory officials.

The total cost to governments is higher under Option 3 due to the duplication of compliance and enforcement activities in the chemicals framework as a whole. States and territories do not currently undertake compliance activities separately for environmental risk management of industrial chemicals. Facilities are generally licensed to operate in the states and territories and this licence includes consideration of all relevant activities related to environmental compliance, not solely compliance for management of industrial chemicals. Therefore, under Option 3, should the powers in relation to environmental risk management of industrial chemicals be undertaken by the Commonwealth, the states and territories will continue to

[39] These estimates are based on the status quo number of all chemicals that are currently assessed by NICNAS. However, depending on the outcome of the NICNAS review, only industrial chemicals assessed by NICNAS as moderate to high risk are assessed for their concern rating. This would reduce the number of chemicals that are likely to be considered by the Working Group/Advisory Committee and the number of chemicals scheduled under the Standard.

undertake the majority of their environmental compliance and enforcement activities for facilities, in addition to the new compliance and enforcement activities undertaken by the Commonwealth specifically for environmental risk management of industrial chemicals. This would result in additional overall resourcing.

Another ongoing cost may include compliance and enforcement of risk management outcomes within the jurisdictions. The impact on existing environmental risk managers in terms of increased or decreased compliance costs will depend on the extent to which the proposed options change the way that industrial chemicals are regulated.

This could vary across chemicals and the baseline is of critical importance. For example if the existing regulator would not have regulated the chemicals at all (that is, the 'no regulation' baseline), then all of the compliance costs are attributed to the reforms. However, if the chemical would have been regulated in a different way, the change in cost is relevant. The cost could either increase or decrease. This increase or decrease in costs is also likely to be influenced by the current resourcing that jurisdictions have in place.

However, beyond the minimal additional resourcing outlined in Appendix J, states and territories are not expected to require significant additional resourcing as the compliance and enforcement effort under a Standard approach will be proportional and risk-based. This will better enable states and territories to focus their regulatory effort on chemicals of greatest concern to the environment.

Under Option 1, as the adoption of decisions under the Standard are non-binding, it is not known to what extent states and territories will implement environmental risk management decisions and the extent of compliance activities is therefore not known.

Under Option 2 compliance costs could remain the same, decrease or increase as a result of the National Standard. This will be dependent on how Option 2 is implemented within jurisdictions' existing frameworks. Under Option 3 it is likely that compliance costs would increase for the Commonwealth and decrease for the states and territories but ultimately have a greater total cost to governments.

6.5 Analysis of Options

Under all options, implementation of the National Standard is likely to result in increased protection of the environment and improve national consistency when compared to the base case. The extent to which these benefits are realised is dependent on the chosen option. This is a reflection that the consistent adoption of risk management decisions, the process by which decision are made and the mechanism for compliance and enforcement varies between the options.

The analysis found that there was a significant net benefit under each of the options considered compared to the status quo. The greatest net benefit is achieved from Option 2 in the order of $112 million (over 10 years in present value terms). Options 1 and 3 had net benefits of $57 million and $105 million respectively (Table 6-5).

Table 6-5: Estimated net benefits of the reforms

	Option 1 $million	Option 2 $million	Option 3 $million
Impact on the community			
Environmental benefits	41	69	69
Public health benefits	67	112	112
Total impact on the community	109	181	181
Impact on industry			
Cost of understanding new framework	-4	-4	-4
Benefits of harmonisation	1.8	3.1	2.0
Cost of risk management actions	-35	-58	-58
Total impact on business	-37	-59	-60
Impact on government			
National Standard development	-0.8	-0.8	-0.8
Legislative and administrative changes	-3	-3	-7
Ongoing processes for the National Standard	-11	-6	-8
Total impact on government	-15	-10	-16
Total net benefit	**57**	**112**	**105**

Note: Numbers may include rounding errors.

6.5.1 Summary of Option 1

Under Option 1, national environmental risk management decisions would be made in accordance with a National Standard. The National Standard would be established in a non-statutory framework and implementation of decisions by jurisdictions would be non-binding.

Due to the non-statutory nature of this option, the following conclusions about the efficacy or likelihood in achieving the stated objectives are:

- Option 1 is not expected to meet the overarching objective of the reforms providing a nationally consistent, transparent and predictable approach for environmental risk management of industrial chemicals to industry.
- Option 1 is only partially expected to meet the overarching objective of the reforms of achieving better protection of the environment through improved management of the environmental risks posed by industrial chemicals.

As the National Standard will continue to operate under this option, it has been determined that there will continue to be a net benefit from implementation of Option 1. However, the net benefit is not as great as Option 2 or 3 based on the non-binding nature of the option.

6.5.2 Summary of Option 2

Under Option 2, national environmental risk management decisions would be made in accordance with a National Standard. The National Standard and decision making powers would be established under Commonwealth legislation, with jurisdictional legislation for implementation and compliance.

The following conclusions about the efficacy or likelihood in achieving the stated objectives are:

- Option 2 is expected to meet the overarching objective of the reforms providing a nationally consistent, transparent and predictable approach for environmental risk management of industrial chemicals to industry.
- Option 2 is expected to meet the overarching objective of the reforms of achieving better protection of the environment through improved management of the environmental risks posed by industrial chemicals.

As consistency across jurisdictions is anticipated to be achieved and the environmental benefits of the reforms realised, the net benefit for Option 2 is greater than Option 1. The likely benefits are also expected to be greater than Option 3, mainly due to efficiencies of Options 2 compared to Option 3 as regulatory efforts between the Commonwealth and states and territories are not expected to be duplicated for Option 2.

Option 2 is determined to be the least cost implementation of the National Standard in order to achieve the described benefits. Therefore, Option 2 is considered to be the preferred option.

6.5.3 Summary of Option 3

Under Option 3, national environmental risk management decisions would be made in accordance with a National Standard. The National Standard and associated compliance measures would be established under a Commonwealth legislative framework.

The following conclusions about the efficacy or likelihood in achieving the stated objectives are:

- Option 3 is expected to meet the overarching objective of the reforms providing a nationally consistent, transparent and predictable approach for environmental risk management of industrial chemicals to industry.
- Option 3 is expected to meet the overarching objective of the reforms of achieving better protection of the environment through improved management of the environmental risks posed by industrial chemicals.

As consistency across jurisdictions is anticipated to be achieved and the environmental benefits of the reforms realised, the likely benefits associated with Option 3 is greater than Option 1. However, the likely benefits for Option 3 would be less than Option 2, mainly due to duplication in regulatory effort between the Commonwealth and states and territories for Option 3 and the costs associated with establishing a new Commonwealth regulator.

7 CONSULTATION

The purpose of consultation is to elicit stakeholder feedback on proposed regulatory action by government. The focus groups were designed to provide stakeholders with an opportunity to explore the Consultation RIS and, if required, to seek clarification about the identified problems, the three options under consideration, and the results of the impact analysis.

As the COAG Best Practice Regulation Guidelines note, such feedback can 'improve the quality of the solution adopted' by:

- ensuring that both those affected by regulation, and the actioning agencies, have a good understanding of what the problem is
- providing perspectives and suggestions, on alternative options to address the problem, from those parties that will be affected by the government action
- helping regulators assess competing interests
- 'providing a check on the regulator's assessment of costs (including compliance costs) and benefits and whether/how the proposed option will work in practice, thus
- reducing the risk of unintended consequences if a particular option is adopted
- identifying interactions between different types of regulations
- possibly enhancing voluntary compliance through greater understanding and acceptance of a proposal, thereby reducing reliance on enforcement and sanctions.

7.1 Consultation Regulation Impact Statement

The Consultation RIS was released for public comment for a period of 11 weeks (from 11 April 2013 to 28 June 2013). Stakeholders were invited:

- to attend a series of public forums that were held in Sydney, Brisbane, Melbourne, Adelaide and Perth to provide stakeholders with an opportunity to ask questions or provide feedback on the Consultation RIS.
- to request one-on-one meetings in case stakeholders wanted the opportunity to ask questions or provide feedback in a confidential setting.
- to lodge a written submission on the Consultation RIS.

The consultation process and public forums were published on the SCEW website. Targeted stakeholders from over 180 organisations and individuals identified by the National Chemicals Environmental Management Working Group (NChEM) were contacted by email inviting them to register their interest in attending the focus groups.

Stakeholders were also asked to forward the invitation to other interested people within their organisation, to members of their organisations, and any other parties that would be interested in attending. Written submissions were also invited to the Consultation RIS.

In all, 63 stakeholders registered their interest in attending the focus groups and 51 stakeholders actually attended the focus groups representing 34 different interested parties. No stakeholder requested a one-on-one meeting with PwC and government representatives. Eleven written submissions were received (See Figure 7-1 and Figure 7-2 for distribution of responses).

Table K-1 in Appendix K outlines the stakeholders who provided written submissions or attended focus groups.

Figure 7-1: Distribution of attendance at focus groups (34)

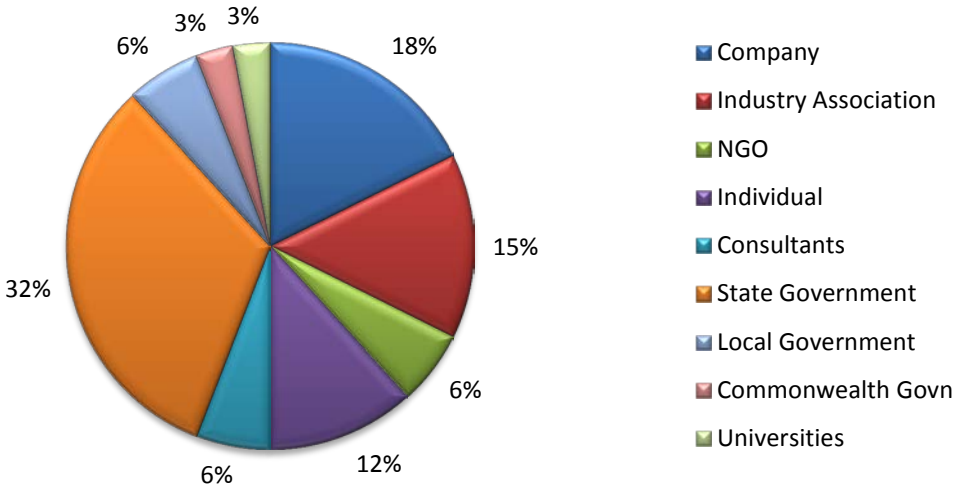
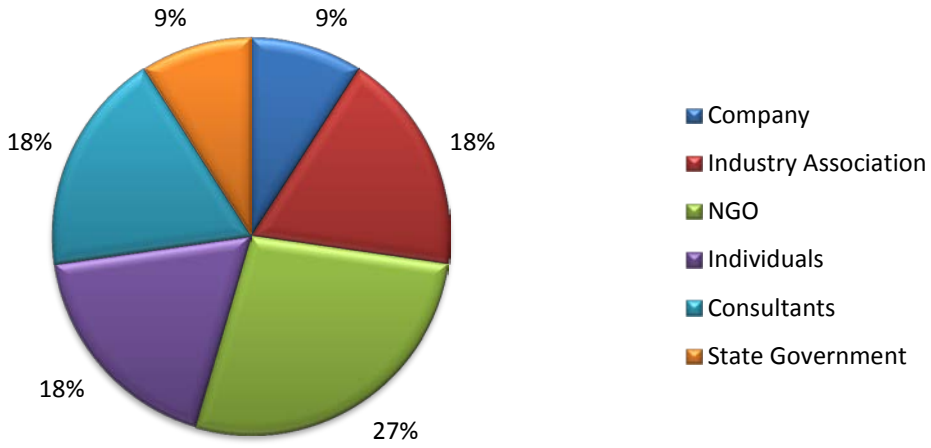


Figure 7-2: Distribution of submission of written responses (11)



7.1.1 Outcomes from consultation

From the focus groups and written submissions, no view was expressed that there was not the need for the proposed reforms. Stakeholders agreed that there is benefit in government reform to protect the environment and improve the effectiveness and efficiency of risk management actions for industrial chemicals that have the potential to cause environmental harm.

Feedback received favoured an approach that harmonises implementation of national decisions, is economical and integrated with the proposed changes arising from the review of NICNAS as well as existing risk management frameworks implemented by states and territories.

For example, stakeholders expressed that the options should be designed to limit increases in regulatory timeframes, duplication of effort and additional costs being added to the assessment of chemicals. It was considered that the consideration of environmental risk management should be integrated with the existing NICNAS processes and align with any changes as a result of the NICNAS review.

A majority of stakeholders did not state a preferred option for implementation of the proposed reforms. In some cases this was stated to be because further detail was required in order to visualise how environmental standards-setting would work in practice. This included on detailed implemented questions such as: which pieces of legislation would change under the options and the potential mechanism for funding the options.

However there was no contention on the nature of the problem presented. Broadly, the following observations were made on the options:

- Option 1 was not viewed favourably, primarily due to the voluntary and informal nature. The reliance on existing regulatory frameworks was seen as unlikely to be able to meet the stated objectives of the proposed reforms and would likely be a continuation of the status quo. It was considered that Option 1 would have limited transparency, efficiency and accountability

- Option 2 was viewed ‘the most feasible and effective option’ due to its streamlined and balanced nature and that it is similar to the existing working model for Poisons Scheduling. It was considered to be superior to Option 1 in consistent application of environmental risk management measures. However, it was considered by some that there is still the potential of lack of harmonisation if implementation is not consistent across all jurisdictions. It was viewed as a least costly alternative to compared to Option 3.

- Option 3 was viewed as the option that was most likely to achieve national consistency through the establishment of national and uniform regulatory system. However, concerns were raised about the duplication of legislation, cost of establishing a new regulatory body and time for industry to familiarise themselves with the framework and the ongoing timeframes and cost to support the new framework.

There were also a number of issues raised with reference to the impact analysis including:

- a limited focus on the public health benefits of the options (from both a qualitative and quantitative perspective)
- feedback from industry that a focus on existing chemical examples is likely to lead to an overstatement of the compliance costs to be incurred by government and industry as the costs of controls on new chemicals is likely to be less than on existing chemicals
- the relatively small size of the net benefits for the options
- the relatively high cost of the options on a per unit chemical basis.

7.2 Refinements to policy options

In response to stakeholder feedback a number of refinements to the options in the Consultation RIS have been developed for the Decision RIS in consultation with all jurisdictions. The refinement of the options has been guided by the overarching objective – to *achieve better protection of the environment through improved management of the environmental risks posed by industrial chemicals* – and the following principles:

- Administration and compliance costs, both for government and industry, are kept as low as possible, and are appropriate for the scope of the regulation.
- The standard setting process should integrate smoothly with the NICNAS risk assessment process and relate appropriately to the other related risk-management frameworks (e.g. poisons scheduling, workplace health and safety, and dangerous goods transport).
- Implementation of the standards within jurisdictions should readily integrate with other existing jurisdictional processes, such as environmental licensing or hazardous waste regulation.
- The process and its outcomes should be as transparent and predictable as possible for industry.
- The reform should generate positive outcomes for business by providing greater consistency across jurisdictions.

These refinements and principles were agreed to by all jurisdictions and have been used as the base for stakeholder consultation on the Decision RIS. The principal area of refinement responds to stakeholder preference for a regulatory regime that is simple, transparent and is as cost-effective as possible.

Each option in the Consultation RIS proposes that the standard setting body will translate high level environmental risk management recommendations from NICNAS into practical risk management actions by making individual decisions on each chemical assessed, with the differences between each option relating primarily to how the decision would be implemented.

The proposed alternative to making individual decisions on each chemical assessed is the development of a national Standard for the environmental management of industrial chemicals

as outlined in Section 5.1. The national standard is designed to be able to be easily understood by industry as this is what is in place for other sectors, such as the Poisons Standard. A standard would reduce the need to negotiate and draft individual decisions for each chemical on a case-by-case basis, thereby streamlining the process and reducing the time and resources required to make a decision.

In response to feedback, the Standard has been designed to ensure smooth integration with the NICNAS risk assessment process. There is also potential for NICNAS to consider the national standard during the chemical risk assessment process. NICNAS would recommend which risk category the chemical should be assigned to, thereby creating efficiencies and facilitating integration between the assessment and risk management processes. A streamlined and efficient process will be necessary to ensure timely decisions on appropriate risk management actions can be made.

This approach would also provide greater transparency, predictability and certainty for industry as risk management actions would be based on an existing, known, Standard. The criteria for each category or class of chemicals would be publicly available, as would the standardised controls that are likely to apply to chemicals in each of those categories or classes. This information will enable industry to better understand and engage with the regulatory framework.

For jurisdictions, implementation costs under a Standards approach should be kept as low as possible because the greater burden of responsibility for environmental risk management would shift from government agencies to chemical users. It is intended that the majority of risk management actions set out in the Standard will be practical and capable of being implemented by chemical users without further definition or explanation by jurisdictions. This responds to stakeholder feedback regarding the capacity of governments to implement reforms in a tight fiscal environment.

7.3 Decision Regulation Impact Statement

Following the refinements to the options as described above, targeted stakeholder consultation with key partners and stakeholder groups has been undertaken during the development of the Decision RIS.

These consultations have been focussed on the design of the National Standard and the associated scheduling process of industrial chemicals for environmental risk and the updated impact analysis which was completed by the Centre for International Economics.

Consultation on the broader policy considerations was conducted between March 2014 and January 2015. Consultation on the updated impact analysis was undertaken between July 2014 and January 2015.

These reforms have been developed in consultation with the ongoing process under the NICNAS review.

8 IMPLEMENTATION AND REVIEW

8.1 Implementation

From a constitutional perspective the Commonwealth has a range of legislative powers that may support national implementation of the options proposed for the regulation of industrial chemicals. Typically in the context of chemical and plastics regulation approaches to regulation where the states and territories retain their regulatory power, but cooperate with the Commonwealth have been more common. [40] A cooperative scheme is one in which each participating jurisdiction develops legislation to facilitate the application of a standard set of legislative provisions in that jurisdiction to regulate a matter of common concern.[41]

Other mechanisms used to formalise national arrangements include Intergovernmental Agreements, Memorandums of Understanding and Mutual Recognition Agreements. It is not uncommon for these mechanisms to be used in conjunction with the development of regulation. By seeking agreement on the specifics of implementation through the use of one of these mechanisms, the subsequent development of regulation can be more streamlined and only address those matters of the scheme that require legal force.

Following agreement to a proposed option for establishing the National Standard, further analysis and consultation will be required on the preferred mechanism for implementation. This would have regard to establishing appropriate constitutional and legislative support. All jurisdictions would be involved in this planning process to develop and implement the National Standard. An intergovernmental agreement could be used as one potential mechanism to progress the reforms to the detailed implementation phase.

One consideration when devising an approach to regulation will be the level of consistency required in the proposed outcome .For example, under option 1, this may take the form of an intergovernmental agreement, whereas under option 2 and 3 this would involve consideration of what existing legislation could be amended or the drafting of new legislation. Jurisdictional differences will be considered, however it will largely be up to the jurisdictions to determine what changes they need to make to effectively implement the agreed option.

Option 2 proposes that environmental risk management decisions will be implemented by the Commonwealth, and jurisdictional governments. All states and territories would adopt the decision and make it enforceable through primary or subordinate legislation. Compliance and enforcement of the national environmental risk management decisions would remain the responsibility of the jurisdictional governments where the components of the decision fall within their legislative purview. Similarly the Commonwealth would be responsible where the components pertained to its responsibility.

[40] Chemicals and Plastics Regulation – Lessons for National Approaches to Regulation – January 2009 p18

[41] John Ledda, *The Drafters Guide to Cooperative Schemes*, paper given at Drafting forum 2001, Melbourne

Option 3 environmental risk management decisions will be implemented by Commonwealth legislation. The new Commonwealth legislation will also specify compliance and enforcement measures to be applied nationally and it is likely that jurisdictional enforcement bodies and officials could be given relevant compliance and enforcement powers under the Commonwealth legislation.

8.1.1 Funding

The Consultation RIS and the Decision RIS do not explore funding options. A range of alternative options for resourcing the proposed risk management framework could be considered, including cost recovery arrangements.

Several alternatives could be considered, each supported by different arguments and with different advantages. For example, the Productivity Commission considered the following[42]:

- public good activities such as frameworks for risk management ('policy-relevant standards') might best be funded by governments, with Commonwealth, state and territory governments sharing the cost when a national body was preparing model or template regulations that the jurisdictions subsequently adopt; whereas
- 'technical standards' set on a chemical-by-chemical basis might be more appropriately funded through cost recovery from the firms that use those chemicals.

Should ministers agree to proceed with an option, there will be further consultation and engagement with states and territories and other impacted stakeholders on funding arrangements, as part of implementation.

8.2 Review

Under the COAG guidelines all standards and regulatory materials must be reviewed at periods of no more than ten years. To complement the COAG principles, it is recommended that legislation and/or regulations be reviewed at an interval of not less than five years after completion of development of the National Standard and required legislative changes (if required), from the date of implementation.

A timeline and key steps for implementation and review of government action will be developed pending a final decision on the preferred option.

[42] Productivity Commission, *Lessons for National Approaches to Regulation,* 2009.

9 EVALUATION AND CONCLUSION

The Decision RIS has assessed Option 2 as being the preferred option for implementation of a national approach to environmental risk management of industrial chemicals. Option 2 is determined to be the least cost implementation of the National Standard in order to achieve the described benefits.

- Under Option 1, national environmental risk management decisions would be made in accordance with a National Standard. The National Standard would be established in a non-statutory framework and implementation of decisions by jurisdictions would be non-binding.
    - Due to the non-statutory nature of Option 1, it is not expected to meet the overarching objective of the reforms providing a nationally consistent, transparent and predictable approach for environmental risk management of industrial chemicals to industry. It is also only partially expected to meet the overarching objective of the reforms of achieving better protection of the environment through improved management of the environmental risks posed by industrial chemicals.
    - As the National Standard will continue to operate under this option, it has been determined that there will continue to be a net benefit from implementation of Option 1. However, the net benefit is not as great as Option 2 or 3 based on the non-binding nature of the option.
- Under Option 3, national environmental risk management decisions would be made in accordance with a National Standard. The National Standard and associated compliance measures would be established under a Commonwealth legislative framework.
    - Option 3 is expected to meet the overarching objective of the reforms providing a nationally consistent, transparent and predictable approach for environmental risk management of industrial chemicals to industry, and of achieving better protection of the environment through improved management of the environmental risks posed by industrial chemicals.
    - As consistency across jurisdictions is anticipated to be achieved and the environmental benefits of the reforms realised, the likely benefits associated with Option 3 is greater than Option 1. However, the likely benefits for Option 3 would be less than Option 2, mainly due to duplication in regulatory effort between the Commonwealth and states and territories for Option 3 and the costs associated with establishing a new Commonwealth regulator.
- Under Option 2, national environmental risk management decisions would be made in accordance with a National Standard. The National Standard and decision making powers would be established under Commonwealth legislation, with jurisdictional legislation for implementation and compliance.
    - Option 2 is expected to meet the overarching objective of the reforms providing a nationally consistent, transparent and predictable approach for environmental risk

management of industrial chemicals to industry, and of achieving better protection of the environment through improved management of the environmental risks posed by industrial chemicals.

- As consistency across jurisdictions is expected to be achieved and the environmental benefits of the reforms realised, the net benefit for Option 2 is greater than Option 1. The likely benefits are also expected to be greater than Option 3, mainly due to efficient and streamlined nature of Option 2 compared to Option 3 as the National Standard would be established in Commonwealth legislation but implemented through state and territory legislation. Therefore, regulatory efforts between the Commonwealth and states and territories are not expected to be duplicated for Option 2 and the costs of establishing a new Commonwealth regulator are avoided.

Therefore, Option 2 is determined to be the least cost implementation of the National Standard in order to achieve the described benefits.

APPENDIX A GLOSSARY OF TERMS

Advisory Committee	An advisory committee in the context of this RIS is an independent statutory group responsible for providing advice to the Decision Maker for scheduling chemicals under the National Standard.
Chemical	For the purposes of this regulation impact statement, a chemical as defined by NICNAS[43] describes a: • chemical element, including a chemical element contained in a mixture, or • compound or complex of a chemical element, including such a compound or complex contained in a mixture, or • substance of unknown or variable composition, complex reaction products or biological materials (UVCB), or • naturally-occurring chemical but does not include: • an article, or • a radioactive chemical, or • a mixture. The use of 'Chemical' in the context of the RIS refers to an 'Industrial Chemical'.
Concern	Concern is a measure of the potential consequences of a chemical substance being approved for use in Australia. Potential consequences of a chemical's use could be positive or negative. They include considerations of the risk defined by the risk assessment, the inherent hazard characteristics of a chemical, and any relevant socioeconomic factors related to a chemical's use.
Decision Maker	The person with responsibility for scheduling or listing decisions made under the National Standard and the risk management actions assigned to an assessed industrial chemical
Environmentally hazardous substance	An environmentally hazardous substance is at least one of the following: • 'H400: Very toxic to aquatic life' under the GHS; or • 'H401: Toxic to aquatic life' under the GHS; or

[43] The NICNAS Handbook including definitions in Appendix A is available on the NICNAS website.

	• ‘H402: Harmful to aquatic life’ under the GHS; or • ‘H410: Very toxic to aquatic life with long lasting effects’ under the GHS; or • ‘H411: Toxic to aquatic life with long lasting effects’ under the GHS; or • ‘H412: Harmful to aquatic life with long lasting effects’ under the GHS; or • ‘H413: May cause long lasting harmful effects to aquatic life’ under the GHS; or • ‘H420: Harms public health and the environment by destroying ozone in the upper atmosphere’ under the GHS; or • is accessible to and adversely impacts on terrestrial life; or • persistent, bioaccumulative and toxic (PBT) according to national PBT criteria; or • PB, BT or PT based on the definitions of P, B and T in the national PBT criteria; or • shown to adversely affect the hormone systems in wildlife or humans
Existing industrial chemical	An existing chemical is one that is listed on the Australian Inventory of Chemical Substances and is permitted to be manufactured or imported into Australia in accordance with conditions of use, if any.
Exposure (environmental)	Exposure is the amount of chemical released to the environment and the route by which it is released. Environmental exposure assessments in assessments prepared by NICNAS characterise either the extent to which organisms may be exposed to a chemical stressor, or the concentration of a chemical in various environmental compartments (e.g. water, soil, air), which may then have the potential to affect organisms. The three main steps to an exposure assessment are; • Release estimation • Consideration of the environmental fate and partitioning behaviour • Derivation of a predicted environmental concentration.

	Additional information on environmental exposure assessment is presented in the Environmental Risk Assessment Guidance Manual for Industrial Chemicals[44].
Hazard (environmental)	The environmental hazards of a chemical are those characteristics of a substance, whether they be measured, observed or calculated, that have the potential to cause harm to an organism, or any other aspect of the environment, for example, the ozone layer. A chemical's properties, and therefore hazards, are characteristics that generally do not change, unless new data becomes available.
Industrial chemical	Under the *Industrial Chemicals (Notification and Assessment) Act* 1989 (Cth), an industrial chemical is any chemical that has an industrial use (s 7(1)). The term 'industrial use' is defined to mean a use other than an excluded use (s 7(2)). The term 'excluded use' is defined in s 7(2). Therefore, an industrial chemical is any chemical that is not: a. An agricultural chemical or a constituent of an agricultural chemical; or b. A veterinary chemical or a constituent of a veterinary chemical; or c. A therapeutic chemical or an ingredient or component in the preparation or manufacture of goods for therapeutic use; or d. A food intended for consumption by humans or animals or a constituent in such food; or e. A food additive in food referred to above.
National Standard	A standard is a set of established requirements in relation to, in this case, environmental risk management of industrial chemicals. The National Standard will establish a standard set of risk management requirements for industrial chemicals according to a chemical's level of concern to the environment.
National Standard Development Group	The National Standard Development Group is the group tasked with development of the design of the National Standard and the risk management actions that will be appropriate for each class or category of chemicals.

[44] The Environmental Risk Assessment Guidance Manual for Industrial Chemicals can be found on the Standing Council on Environment and Water website.

New industrial chemical	According to NICNAS, a new industrial chemical is either: • a chemical that is an industrial chemical listed on the AICS for which its introduction is subject to a condition of use under Section 13 of the Act – but only to the extent that the manufacturer or importer of the chemical introduces, or proposes to introduce, the chemical for any other use, or • an industrial chemical not listed as an industrial chemical on the AICS, but does not include: • a reaction intermediate, or • an incidentally-produced chemical. In the case of a synthetic polymer, a new industrial chemical is a chemical that is a new synthetic polymer.
Risk (environmental)	Risk is the likelihood that the hazard will be capable of causing harm to the environment. It is based on the hazard of a chemical and its level of exposure for a specific use and location. Risk is analysed during the risk assessment process and can be represented simplistically as: Risk = Hazard × Exposure
Risk assessment	Risk assessment is the systematic scientific evaluation of potential adverse effects resulting from exposure to a hazardous agent or situation. Risk assessment requires the integration of both quantitative as well as qualitative scientific information.
Risk management	Risk management refers to the process by which policy actions are chosen to control hazards identified in the risk assessment stage. Risk managers consider the scientific evidence and risk estimates – as well as engineering, economic, social and political factors – in evaluating options for risk management and choosing one of those options.
Working Group	The working group for the purposes of this RIS is a non-statutory group responsible for review of risk management recommendations under Option 1. The working group will be made up of government risk managers and technical experts in consultation with community and industry representatives.

APPENDIX B FINDINGS FROM THE CONSULTATION RIS

The Consultation RIS details the impact analysis of the three options examined, including the costs to industry and government, the benefits to society, and net benefit of each option. PricewaterhouseCoopers was engaged through the National Environment Protection Council to develop the Consultation RIS and conduct the consultation process.

The three options in the RIS were described as follows:

- Option 1: Non-statutory development of national environmental risk management decisions by a Working Group for the Standing Council on Environment and Water (SCEW), in the form of model legislative provisions
- Option 2: National decision would be made by a delegate of the SCEW, or Commonwealth environment minister, under Commonwealth legislation and adopted and implemented using Commonwealth, state and territory legislation
- Option 3: National environmental risk management decisions would be made under Commonwealth legislation. The Commonwealth legislation would also specify compliance and enforcement measures that would apply nationally.

It was found that all options, if they were consistently applied, would represent an improvement over the base case, as they would ensure that all environmental risks identified by the NICNAS risk assessment process are addressed in a national risk management decision. Relative to the base case, each option would also increase the extent to which risk management decisions are adopted consistently by jurisdictions – reducing, in turn, the potential for regulatory gaps between jurisdictions and the burden on some businesses that operate across more than one jurisdiction.

Table summarises the findings of the impact analysis presented in the Consultation RIS. Option 2 was found to deliver the greatest net benefit to the community and was therefore considered to be the preferred option.

Table B-1: Impact analysis summary from Consultation RIS

	Option 1	Option 2	Option 3
Costs			
Industry	$65.5 million	$108.9 million	$108.9 million
Government	$11.2 million	$18.3 million	$27.8 million
Total	$76.7 million	$127.2 million	$136.7 million
Benefits	$85.7 million	$142.8 million	$142.8 million
Net Benefit	**$9 million**	**$15.6 million**	**$6.1 million**

Note: Figures represent present value over 10 years, calculated using a discount rate of 7 per cent.

Feedback received on the Consultation RIS indicates that the industry costs are likely to have been overestimated. This is due to the methodologies focus on existing chemicals rather than on new chemicals. The costs also do not assume potential savings or efficiencies in the systems around education and compliance and do not take into account existing costs in jurisdictions for the management of chemicals.

Option 1 is the least costly of the options (at least in terms of quantified costs), however the voluntary nature of the regulatory framework is considered be less effective than Options 2 and 3. While jurisdictional adoption and implementation of risk management decisions are likely to be more frequent and consistent than the base case, inconsistencies are likely to remain. Therefore regulatory gaps may emerge between jurisdictions and delayed or inconsistent management of risks to the environment and to human health through the environment.

Option 2 and Option 3 would introduce regulatory frameworks that are markedly more effective than the base case because they ensure national adoption of a single risk management decision for each chemical. They would reduce the potential for regulatory gaps between jurisdictions, provide greater certainty for industry, reduce the regulatory burden for businesses operating in more than one jurisdiction and would better address the identified objective of protecting the environment and human health.

Option 3 would introduce a regulatory framework that would result in greater national consistency than Option 2 particularly in relation to implementation. However, Option 3 would impose additional costs to establish the new regulatory framework.

Option 2 would impose considerably fewer costs on government in terms of establishing and operating the new regulatory framework than Option 3 (which is reflected in the greater net benefit for Option 2 compared to Option 3).

APPENDIX C CHEMICALS AND THE ENVIRONMENT

C.1 Environmental exposure of industrial chemicals

Exposure of a chemical to the environment is a central consideration in the need for management of a chemical's environmental risks. Without exposure of a chemical to the environment, there is no risk to the environment. However, it is rare for a chemical to have no environmental exposure during its lifecycle. The routes of chemical release and a chemical's behaviour in the environment are important considerations for exposure. These aspects are briefly detailed below. The extent to which the environment is exposed to a chemical is determined through an exposure assessment during an environmental risk assessment.

C.1.1 Chemical release

Chemicals can be released to the environment during all stages of their lifecycle. The chemical lifecycle begins with extraction of raw materials – this includes mining, extraction of oil and gas and other activities. These raw materials are used in chemical manufacturing, processing or refining. Manufactured bulk chemicals are then combined and used to make a wide variety of downstream chemical products. These chemical products may, in turn:

- be used as feedstock for chemical products further downstream
- be used for a variety of industrial activities and services as individual chemicals or in preparations; or
- may be used to make consumer products.

At the end of the lifecycle, chemicals may be released into the environment, recycled for continued use, disposed of in hazardous waste facilities, or disposed of in other ways. Products containing chemicals, similarly, may be reused, recycled, or disposed of in municipal solid waste, in hazardous waste facilities, or through other approved disposal processes.

The processing of the raw materials and feedstocks can result in the release of chemicals to the environment from emission stacks, discharge pipes, waste ponds, storage tanks and other equipment. Bulk chemicals are usually produced in high volumes at large plants and this can result in the large releases of chemicals from manufacturing plants. Similar routes of chemical release to the environment can be expected during product formulation, but the volumes used by plants for product formulation are generally smaller than raw chemical manufacture[45].

Chemicals and chemical products generally need to be transported to another location, either for further processing or use of a chemical product. Transport can be by pipeline, rail, tanker or truck. Generally, environmental exposure during transport is limited, unless an accident occurs or chemicals and products are not properly packaged.

Delayed releases of a chemical after exposure may also result. Chemicals incorporated into plastics and articles may leach from these products and enter the soil, groundwater and air

[45] UNEP (2013), Global Chemicals Outlook – Towards Sound Management of Chemicals, available on the United Nations Environment Programme website.

around a waste disposal facility. This release may occur over a long period of time as the plastic or article is exposed to environmental conditions and breaks down.

In general, discharge into waterways represents the majority of chemical release in Australia. Release is predominantly expected through drainage systems leading to sewage treatment plants, which ultimately discharge to marine and fresh water environments.

C.1.2 Environmental fate and partitioning behaviour

The second aspect to determining the extent to which the environment is exposed to a chemical is the chemical's fate in the environment and its partitioning behaviour – that is, where the chemical ends up in the environment if released, in what forms, and how long it takes to degrade or reach its final location. Chemicals can degrade into their component elements or into simple molecules such as water and carbon dioxide. Chemicals may also partition to different compartments in the environment. After entering the environment and depending on a chemical's properties and characteristics, it may transfer from the compartment into which it is released – such as water – into another compartment – such as air or sediment. The likelihood and ease to which degradation and partitioning occurs depends on the characteristics of the chemical and the conditions in the environment[46].

C.2 Environmental effects of chemicals in Australia

The main externalities of industrial chemical use arise when a chemical is exposed to the environment at levels that may cause adverse effects on any aspect of the environment, including humans. A chemical may be exposed to the environment from a single source or multiple points of release that combine to cause adverse environmental effects.

Globally, there are numerous examples of chemicals that were widely used for many years before it was realised that they were having serious adverse impacts on the environment and human health. Some of these toxic chemicals persist in the environment for many years, are distributed and transported in air and water worldwide and accumulate in the food chain harming wildlife and humans. Examples of some of these types of chemicals are listed on the Stockholm Convention on Persistent Organic Pollutants (POPs). The Montreal Protocol on Substances that Deplete the Ozone Layer is another treaty that was designed to manage the risk of certain chemicals damaging the Ozone Layer. The *Ozone Protection and Synthetic Greenhouse Gas Management Act 1989* (Cwth) is one of the successful national approaches to chemicals management that has resulted in a reduction in emission of Ozone Depleting Substances and Synthetic Greenhouse Gases, and consequential protection of the environment.

The majority of chemicals used in Australia are generally of low concern as they do not cause harm to the environment or human health in the manner in which they are used. In some circumstances, some chemicals can cause harm and have adverse impacts on the environment. All chemicals that are managed appropriately should present a low risk to the environment. However, whether through a lack of knowledge or improper management, some

[46] EPHC (2009), Environmental Risk Assessment Guidance Manual for Industrial Chemicals available on the Standing Council on Environment and Water website.

hazardous chemicals are causing harm to the environment. Indeed, Australia has a legacy of environmental damage as a direct result of chemical use, industrial processes and waste disposal.

Historical examples show that the scale of the problems caused by poor management of industrial chemicals can be large and long lasting. Examples include:

- Remediation facilities have been established at Royal Australian Air Force sites in Edinburgh (SA), Pearce (WA) and Townsville (Qld) that are contaminated with perfluorinated chemicals from fire-fighting foams.[47]
- At Rhodes Peninsula, the cost to remediate land contaminated with numerous chemicals, particularly dioxins, is said to have been over $190 million for both industry and government combined.[48]
- Sydney Harbour sediments are so contaminated with dioxins, furans, heavy metals and other toxic chemicals that there is a ban on commercial fishing in the harbour and there are significant restrictions on the consumption of fish caught recreationally.[49]
- In the Botany Bay area, pumping up and remediating groundwater contaminated with chlorinated hydrocarbons has involved building a treatment plant at a cost of $167 million.[50]
- Fifteen thousand tonnes of hexachlorobenzene waste have been stockpiled since 1991 at Botany with Australia lacking any facility to safely dispose of the waste and no overseas country with a suitable facility prepared to accept it for destruction.[51]
- Most recently in 2014, thirty homes in Adelaide's suburbs have been evacuated due to trichloroethylene contamination concerns in the air, soil and groundwater. Testing affecting another 1400 residents has been ordered. This contamination is believed to be a legacy issue from a former car manufacturing facility.[52]

Most of the chemicals involved in these historical examples are highly toxic, become more concentrated over time and up the food chain (bioaccumulate) and persist in the environment for many years – persistent, bioaccumulative and toxic (PBT) chemicals. Once released into the environment, even at very low concentrations below their measured level of toxicity, PBT chemicals pose an increased risk of accumulating in exposed organisms and of causing adverse effects. They may also biomagnify through the food chain resulting in very high

[47] CRC Care (2014) Fighting Fire-Fighting Foams. Available on the Cooperative Research Centre for Contamination Assessment and Remediation of the Environment website.

[48] NSW Audit Office (2014) Managing Contaminated Sites website.

[49] NSW Food Authority (2013) Sydney Harbour Seafood website and NSW Department of Primary Industries, Fishing in Sydney Harbour website.

[50] National Water Commission (2012), Groundwater Essentials pdf document.

[51] Orica (2012), Hexachlorobenzene (HCB) waste at the Botany Industrial Park, Sydney – A concise history of management and disposal efforts

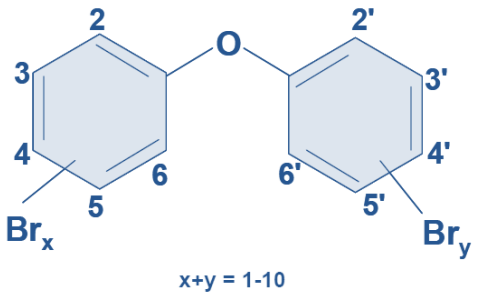
[52] South Australia Environment Protection Authority (2014), EPA Assessment Areas – Clovelly Park-Mitchell Park website.

internal concentrations, especially in top predators. Importantly, it is difficult or impossible to reverse the adverse effects of PBT chemicals once they have been released to the environment and they persist for many generations.

C.3 Chemicals case study

Pentabromodiphenyl ether (BDE) and octaBDE (see Figure C-1) were assessed by the NICNAS as priority existing chemicals. They were prioritised for assessment because of their persistent, bioaccumulative and toxic properties. Their effects are of global concern and both are now listed on the Stockholm Convention as Persistent Organic Pollutants (POPs). Australia is undertaking a domestic treaty making process to allow the Government to decide if it will ratify their listing. The Australian Government Department of the Environment is evaluating potential domestic management options and implementation arrangements.

Figure C-1: Structure of PBDEs



Penta- and octaBDE are brominated flame retardants (BFRs) that are used to help inhibit the ignition of combustible materials. They have been used in a variety of commercial products around the world to minimise the spread of fires in homes and commercial spaces. PentaBDE is mainly used in polyurethane foams, for example in furnishings, while octaBDE is used in acrylonitrile/butadiene/styrene hard plastics that are used in applications such as electrical equipment casings[53].

Penta- and octaBDE are widely found in office, household and urban environments. They are reproductive and neurodevelopmental toxins. Vulnerable groups include pregnant women and infants, as they may affect the embryo's central nervous system development. OctaBDE may also cause impaired fertility.

In the environment, penta- and octaBDE is present in waste water, surface waters and sediment. In Australia, they have been measured in indoor air, dust and the surface wipes of televisions, refrigerators, stereo equipment and DVD players, in aquatic environments and in human blood and breast milk. Penta- and octaBDE, and other brominated flame retardants, have been detected in many Australian animals, including Tasmanian Devils, fish, squid and crabs from Sydney Harbour and other Australian waterways, in Eastern Grey kangaroos and in the eggs of birds such as Silver Gulls, White Ibis and Little Penguin.[54]

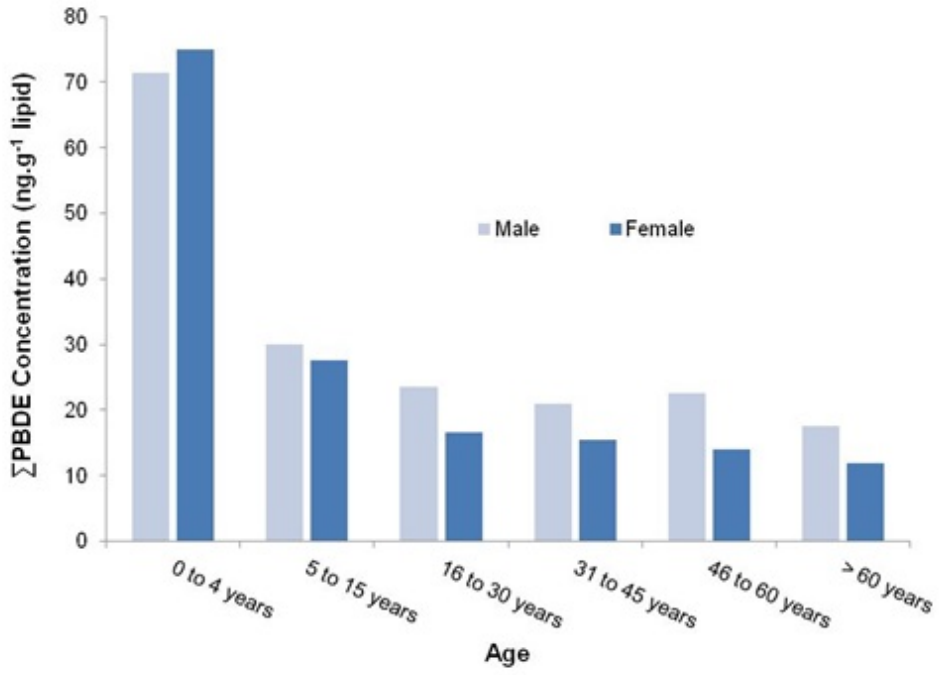
[53] NICNAS (2007) Interim Public Health Risk assessment of Certain PBDE congeners pdf document.

[54] Roach A., et al. (2008) in Organohalogen Compounds 70; Losada S., et al (2009) in Environment International 35; Toms L., et al. (2006) Assessment of concentrations of polybrominated diphenyl ether flame retardants in indoor environments in Australia. Available on the Department of Environment website; Harden, F., et al. (2005) Organochlorine Pesticides (OCPs) and Polybrominated Diphenyl Ethers (PBDEs) in the Australian Population: Levels in Human Milk, Environment Protection and Heritage Council of Australia and New Zealand

Penta- and octaBDE cause adverse effects on a number of aquatic and terrestrial organisms including everything from plankton to mammals and birds. They bioaccumulate in organisms and can be found in high concentrations in top predatory birds and mammals in pristine environments such as the Arctic. Their pollution of remote areas reflects their capability for long range transport and transboundary movement.[55, 56]

Penta- and octaBDE are only two of the poly-brominated diphenyl ether (PBDE) flame retardant chemicals widely present in the Australian population. Studies by the Australian Government Department of the Environment in 2006 demonstrated that concentrations of these chemicals are highest in children under five years old. Similar findings on the concentrations of PBDEs in human breast milk were reported in a 2014 documentary by Genepool Productions – *The Secret Life of Breasts* – that demonstrates that PBDEs continue to be detected in the Australian population. While there is no direct evidence linking these levels to impacts on human health, action is being taken by most countries to prevent further increases in PBDEs such as penta- and octaBDE.

Figure C-2: Mean ΣPBDE concentration (ng.g^{-1} lipid) by gender and age, 2004-05



Source: Toms et al (2006), 'Assessment of the concentrations of polybrominated diphenyl ether flame retardants in the Australian population: levels in blood', prepared for the Department of the Environment and Heritage, November.

Risk management actions have been taken to curtail the further use of penta- and octaBDE in Australia, but the steps taken illustrate the limitations of the regulatory system. Assessments on both chemicals were undertaken under the NICNAS as priority existing chemicals. As there

[55] US EPA (2014) website; Environment Canada (2013) website; NICNAS (2007) Interim Public Health Risk assessment of Certain PBDE congeners, pdf document.

[56] NICNAS (2007) Interim Public Health Risk assessment of Certain PBDE congeners, pdf document.

was no current importer or manufacturer of octaBDE, the Director of NICNAS was able to withdraw octaBDE from the Australian Inventory of Chemical Substances (AICS) in 2007, thereby preventing its domestic manufacture or import as a chemical[57]. This does not prevent a new application for use and entry into the AICS, and therefore does not prevent the associated environmental effects of OctaBDE. PentaBDE is the subject of a temporary ministerial ban under Section s 61(2) of the ICNA Act, preventing its import into Australia or its domestic manufacture but this remains in force only until the Director of NICNAS publishes a final assessment report under s 60F of the ICNA Act.

One of the greatest problems in relation to environmental exposure of pentaBDE and octaBDE is available information on the appropriate end-of-life disposal of the chemicals and products containing the chemicals to prevent release to the environment. These examples highlight that substantial cooperation from state and territory environment agencies will be needed to deal with the waste management issues for chemicals, again emphasising the need for effective cooperative mechanisms. However, each jurisdiction, and sometimes each local government, has its own regulations for waste management. Because of the potential for the long range transport of these chemicals, the environmental exposure is not limited to a single locality within a jurisdiction. Therefore, a national approach for the management of these chemicals is needed for appropriate protection of the Australian and global environment.

The National Standard described earlier in the document would provide a mechanism for consideration of a consistent, national approach for the waste disposal issues associated with chemicals and provide a statutory framework for making streamlined, national risk management decision. Options 2 and 3 would take this further and ensure national adoption of risk management decisions (adoption of risk management decisions under Option 1 would be at the discretion of the states and territories).

It is likely that Australia's regulatory arrangements will also continue to face industrial chemicals similar to PBDEs with the potential for significant impacts on the environment and, through environmental exposure, could significantly affect human health. The National Standard would assist in ensuring a consistent approach to management of these chemicals nationally for the benefit of the environment, human health and industry.

[57] Under Section 63 of the Industrial Chemicals (Notification and Assessment) Act 1989, a priority existing chemical must be removed from the Australian Inventory of Chemical Substances where it has been a priority existing chemical for at least 12 months, an application for assessment of the chemical has not been received and the Director has not caused the chemical to be assessed. Octa-BDE was removed from the inventory as no applications for assessment were received. Penta-BDE could not be removed from the inventory under this provision as applications for assessment were received.

APPENDIX D NATIONAL REGULATORY PROCESSES

D.1 NICNAS

The National Industrial Chemicals Notification and Assessment Scheme (NICNAS) is a statutory scheme within the portfolio of the Minister for Health, established by the *Industrial Chemicals (Notification and Assessment) Act* 1989 (the ICNA Act). The scheme was established under the ICNA Act to aid in the protection of the Australian people and the environment by assessing the risks of industrial chemicals, providing information and making recommendations to promote their safe use. Assessments undertaken by NICNAS are evidence-based evaluations of risk to public health, occupational health and safety and the environment of specified industrial chemicals. All NICNAS activities are cost-recovered.

NICNAS makes risk management recommendations to Commonwealth, state and territory and local government agencies. The risk managers are then responsible for considering the NICNAS recommendations and determining any necessary risk management conditions to control the use, release and disposal of industrial chemicals. These recommendations are not binding and implementation of the recommendations is at the discretion of each risk manager.

Following a review in 2012, the Department of Health has prepared a Regulation Impact Statement on options for reforming the National Industrial Chemicals Notification and Assessment Scheme that recommended a more targeted combination of pre- and post-market regulatory controls for new chemicals, and post-market regulatory controls for existing chemicals, with the assessment requirements informed by hazard and exposure[58].

D.2 The AICS

NICNAS maintains the Australian Inventory of Chemical Substances (AICS)[59], a legal device that distinguishes new from existing chemicals. The AICS commenced as a listing of all industrial chemicals that were in use in Australia between 1 January 1977 and 28 February 1990. In addition, it includes new assessed chemicals for which a certificate has been issued by NICNAS and corrections as required, as well as chemicals that were regulated by other Australian regulators and have since become industrial chemicals. Listing on AICS as an existing chemical means that chemical can be imported or manufactured in Australia for the proposed use without further notification to or assessment by NICNAS.

The AICS contains around 40,000 chemicals and lists their chemical identity data; it does not contain information on toxicity, use, manufacturers or importers. There is a non-confidential (public) section and a confidential section.

Any chemical not included in AICS is regarded as a new industrial chemical unless it is outside the scope of the ICNA Act or is otherwise exempt from notification. New industrial chemicals must be notified and assessed before being manufactured in, or imported into, Australia.

[58] The Regulation Impact Statement is available on the Department of the Prime Minister and Cabinet website.

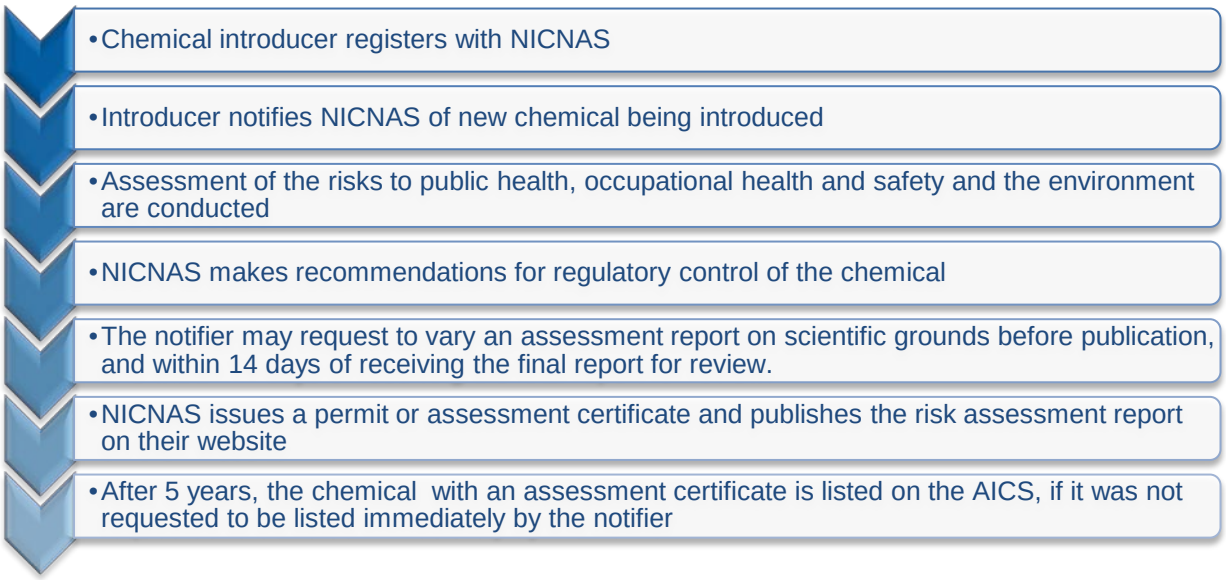
[59] Australian Inventory of Chemical Substances, National Industrial Chemicals Notification and Assessment Scheme website.

Chemicals on the AICS can be imported or manufactured in Australia without first being notified to the NICNAS as new chemicals, regardless of whether a risk assessment has been conducted on the chemical for the NICNAS.

D.3 Assessment processes

Any company or person proposing to introduce (import and/or manufacture) a new industrial chemical in Australia must notify NICNAS, unless exempt under the ICNA Act. All importers and/or manufacturers of industrial chemicals for commercial purposes must also register with NICNAS regardless of the amount of industrial chemicals imported and/or manufactured in that registration year. After notification, the notifier supplies a data package to NICNAS outlining the chemical's information including chemical identity, volume, use and exposure information, and hazard data. The information provided by the notifier is assessed for the chemical's risk to public health, occupational health and safety and the environment. An assessment report is published on the NICNAS website. The report may include recommendations for further regulatory control of the chemical. Either an assessment certificate or permit is issued by NICNAS for the chemical. All chemicals that are assessed by NICNAS and issued an assessment certificate are included on the AICS five years after the certificate date unless the notifier exercises the option for immediate listing. The new chemical assessment process is outlined in Figure D-1.

Figure D-1: New chemical assessment process for the NICNAS



Chemicals listed on the AICS are defined as existing chemicals under the ICNA Act. Around 38,500 of the approximately 40,000 chemicals were grandfathered onto the AICS when the ICNA Act came into force in 1990. Most of these chemicals have not been assessed for their risk to human health or the environment. There are two processes under which an existing chemical may be assessed by the NICNAS – as Priority Existing Chemical (PEC) assessments or part of the Inventory Multi-Tiered Assessment and Prioritisation (IMAP) programme.

A Priority Existing Chemical is an industrial chemical that has been identified as requiring an assessment because there are reasonable grounds that the manufacture, handling, storage, use or disposal of the chemical gives rise, or may give rise, to a risk of adverse health and/or environmental effects[60]. Chemicals are prioritised and assessed under a staged process for completion of a PEC report.

Since NICNAS was established, less than 100 PEC assessments have been completed. The PEC process has been highlighted as being costly and time consuming. NICNAS has implemented a new framework known as IMAP for the assessment and prioritisation of chemicals on the AICS. This arose from recommendations from an independent review of the NICNAS Existing Chemicals Program and subsequent 2008 Productivity Commission review on chemicals and plastics regulation. The new framework provides more timely information about the hazards and risks associated with the use of industrial chemicals. The objectives of the IMAP framework are the identification and rapid assessment of existing chemicals of concern, leading to enhancements in chemical safety information flow and chemicals management. It is a more flexible and transparent approach to the assessment of the large number of chemicals on the AICS and is responsive to the needs of industry, community and government. To date, the government has approved the assessment of 3000 prioritised chemicals, due for completion within four years of the framework's commencement in 2012.

[60] NICNAS PEC assessments available on the NICNAS website.

APPENDIX E STATE AND TERRITORY LEGISLATION

Table E-1: Legislation relating to environmental management of industrial chemicals

Jurisdiction	Legislation, responsible agency and legislative instruments	
Australian Capital Territory	*Legislation*	*Environment Protection Act 1997*
	Responsible agencies	Environment Protection Authority
	Legislative instruments	Environmental authorisation, environmental improvement plans, emergency plans, codes of practice, environmental protection agreements, protection orders, audits
New South Wales	*Legislation*	*Environmentally Hazardous Chemicals Act* 1985 *Protection of the Environment Operations Act* 1997 *Contaminated Land Management Act* 1997
	Responsible agencies	Environment Protection Authority
	Legislative instruments	Chemical Control Orders, licensing, technology assessment, pollution reduction programmes, management orders, remedial restoration, preliminary investigation orders, voluntary management proposals
Northern Territory	*Legislation*	*Waste Management and Pollution Control Act*
	Responsible agencies	Environment Protection Authority
	Legislative instruments	Approvals licences, best practice licences, compliance plans, performance agreements, environmental audits, pollution abatement notices
Queensland	*Legislation*	*Environmental Protection Act 1994* *Waste Reduction and Recycling Act 2011*
	Responsible agencies	Department of Environment and Heritage Protection
	Legislative instruments	Licensing of environmental relevant activities, environmental impact statement, environmental risk management plan, environmental contamination, environmental harm and nuisance, transitional environmental program, environmental protection order, clean up notices, remediation of land, site management plan, waste management strategy, product stewardship schemes, disposal bans, waste reduction and recycling
South Australia	*Legislation*	*Environment Protection Act* 1993
	Responsible agencies	Environment Protection Authority

Jurisdiction	Legislation, responsible agency and legislative instruments	
	Legislative instruments	Licensing, works approvals, environment protection policies, environment improvement programs, voluntary audits, environment performance agreements, environment protection orders, clean-up orders, site contamination assessment orders and site remediation orders
Tasmania	*Legislation*	*Environment Management and Pollution Control Act 1994* *Land Use Planning and approvals Act 1993*
	Responsible agencies	Department of Primary Industries, Parks, Water and Environment Department of Justice
	Legislative instruments	Conditions on planning permits, Environmental Protection Notices, contaminated site notices
Victoria	*Legislation*	*Environment Protection Act 1970* *Environment Protection (Scheduled Premises and Exemptions) Regulations 2007* *Environment Protection (Industrial Waste Resource) Regulations 2009* *Dangerous Goods Act 1985* *Dangerous Goods (Storage and Handling) Regulations 2012*
	Responsible agencies	Environment Protection Authority Department of Environment and Primary Industries Victorian WorkCover Authority
	Legislative instruments	Licensing, restriction, work approvals, permits, pollution abatement notices, discharge controls, waste prevention and management
Western Australia	*Legislation*	*Environment Protection Act* 1986 *Environmental Protection Regulations 1987* *Environmental Protection (Controlled Waste) Regulations 2004* *Environmental Protection (Unauthorised Discharges) Regulations 2004* *Contaminated Sites Act 2003 and Contaminated Sites Regulations 2006* *Dangerous Goods Safety Act 2004*
	Responsible agencies	Department of Environment Regulation Office of the Environmental Protection Authority Department of Mines and Petroleum
	Legislative instruments	Works approvals, licences, guidance notes and environmental protection policies under the Environmental Protection Act 1986. Identification, recording, management and remediation of contaminated sites under the Contaminated Sites Act 2003.

APPENDIX F INTERNATIONAL OBLIGATIONS

F.1 OECD Council Decisions[61]

The OECD Council is the focal point of a continuing review by Member governments – of which Australia is one – of the work of OECD, including the Chemicals Programme. When appropriate, the Council may also agree on Decisions which are legally binding under international law. Alternatively, Member governments, through the Council, may agree on Recommendations, which are expressions of political will to follow certain policies.

The following Council Decisions are relevant to risk management of industrial chemicals.

1. Decision of the Council on the Exchange of Information concerning Accidents Capable of Causing Transfrontier Damage
2. Decision-Recommendation on Further Measures for the Protection of the Environment by Control of Polychlorinated Biphenyls
3. Decision-Recommendation concerning Provision of Information to the Public and Public Participation in Decision-making Processes related to the Prevention of, and Response to, Accidents Involving Hazardous Substances
4. Decision-Recommendation on the Co-operative Investigation and Risk Reduction of Existing Chemicals.

F.2 Stockholm Convention[62]

The Stockholm Convention on Persistent Organic Pollutants is a global treaty to protect human health and the environment from chemicals that remain intact in the environment for long periods, become widely distributed geographically, accumulate in the fatty tissue of humans and wildlife, and have harmful impacts on human health or on the environment.

Exposure to POPs can lead to serious health effects including certain cancers, birth defects, dysfunctional immune and reproductive systems, greater susceptibility to disease and damages to the central and peripheral nervous systems.

Given their long range transport, no one government acting alone can protect its citizens or its environment from POPs. In response to this global problem, the Stockholm Convention, which was adopted in 2001 and entered into force in 2004, requires its parties to take measures to eliminate or reduce the release of POPs into the environment. The POPs listed on the Convention are in Table F-1.

The main provisions of the Convention require each party to:

[61] The full list of OECD Council Acts related to chemicals, including decisions and recommendations can be found on the OECD website.

[62] UNEP (2014) The Stockholm Convention.

- Prohibit and/or eliminate the production and use, as well as the import and export, of the intentionally produced POPs that are listed in Annex A to the Convention (Article 3)
- Restrict the production and use, as well as the import and export, of the intentionally produced POPs that are listed in Annex B to the Convention (Article 3)
- Reduce or eliminate releases from unintentionally produced POPs that are listed in Annex C to the Convention (Article 5)
- Ensure that stockpiles and wastes consisting of, containing or contaminated with POPs are managed safely and in an environmentally sound manner (Article 6)
- To target additional POPs (Article 8)

Table F-1: POPs listed on the Stockholm Convention

Chemicals		Year listed
Aldrin Chlordane DDT Dieldrin Endrin Heptachlor	Mirex Toxaphene Polychlorinated biphenyls Dioxins Furans Hexachlorobenzene (HCB)	2004
α-Hexachlorocyclohexane β-Hexachlorocyclohexane Chlordecone Hexabromobiphenyl Lindane	Pentachlorobenzene PFOS and its salts Commercial octabromodiphenyl ether Commercial pentabromodiphenyl ether	2009
Endosulfan		2011
Hexabromocyclododecane (HBCD)		2013

F.3 Rotterdam Convention[63]

The Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade adopted on 10 September 1998 and entered into force on 24 February 2004.

The objectives of the Convention are:

- to promote shared responsibility and cooperative efforts among Parties in the international trade of certain hazardous chemicals in order to protect human health and the environment from potential harm;
- to contribute to the environmentally sound use of those hazardous chemicals, by facilitating information exchange about their characteristics, by providing for a national

[63] UNEP (2014) The Rotterdam Convention.

decision-making process on their import and export and by disseminating these decisions to Parties.

The Convention creates legally binding obligations for the implementation of the Prior Informed Consent (PIC) procedure. The Convention covers pesticides and industrial chemicals that have been banned or severely restricted for health or environmental reasons by Parties and which have been notified by Parties for inclusion in the PIC procedure. One notification from each of two specified regions under the convention triggers consideration of addition of a chemical to Annex III of the Convention. Severely hazardous pesticide formulations that present a risk under conditions of use in developing countries or countries with economies in transition may also be proposed for inclusion in Annex III.

Once a chemical is included in Annex III, a "decision guidance document" (DGD) containing information concerning the chemical and the regulatory decisions to ban or severely restrict the chemical for health or environmental reasons, is circulated to all Parties.

Parties have nine months to prepare a response concerning the future import of the chemical. The response can consist of either a final decision (to allow import of the chemical, not to allow import, or to allow import subject to specified conditions) or an interim response. Decisions by an importing country must be trade neutral (that is, decisions must apply equally to domestic production for domestic use as well as to imports from any source).

The import decisions are circulated and exporting country Parties are obligated under the Convention to take appropriate measure to ensure that exporters within its jurisdiction comply with the decisions.

The Convention promotes the exchange of information on a very broad range of chemicals. It does so through:

- the requirement for a Party to inform other Parties of each national ban or severe restriction of a chemical;
- the requirement for a Party that plans to export a chemical that is banned or severely restricted for use within its territory, to inform the importing Party that such export will take place, before the first shipment and annually thereafter;
- the requirement for an exporting Party, when exporting chemicals that are to be used for occupational purposes, to ensure that an up-to-date safety data sheet is sent to the importer; and
- labeling requirements for exports of chemicals included in the PIC procedure, as well as for other chemicals that are banned or severely restricted in the exporting country.

F.4 Basel Convention[64]

The Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal is the main international instrument for controlling the movement of hazardous waste between countries and it encourages countries to minimise the generation of hazardous waste. The Convention came into force in 1992 and 181 countries are currently parties to the Convention with 53 signatories.

The Convention places obligations on countries that are party to the Convention. These obligations are to:

- minimise generation of hazardous waste
- ensure adequate disposal facilities are available
- control and reduce international movements of hazardous waste
- ensure environmentally sound management of wastes
- prevent and punish illegal traffic.

Parties to the Convention report annually against Convention classifications through the Convention Secretariat on a range of issues including hazardous waste generation. In Australia, the Basel Convention is implemented through the *Hazardous Waste (Regulation of Exports and Imports) Act 1989.* This Act regulates the export, import and transit of hazardous waste to ensure that hazardous waste is disposed of safely so that human beings and the environment, both within and outside Australia, are protected from the harmful effects of the waste.

F.5 Minamata Convention[65]

The Minamata Convention on Mercury is a global treaty to protect human health and the environment from the adverse effects of mercury. It was agreed on 19 January 2013 and has 128 signatories, including Australia, and 12 countries have ratified the Convention.

The Convention draws attention to a global and ubiquitous metal that, while naturally occurring, has broad uses in everyday objects and is released to the atmosphere, soil and water from a variety of sources. Controlling the anthropogenic releases of mercury throughout its lifecycle has been a key factor in shaping the obligations under the Convention.

Key elements of the Minamata Convention are:

- restrictions on the international trade of elemental mercury
- phase-out by 2020 of the manufacture, import and export of mercury-added products listed in the relevant annex (most batteries, some classes of lamps, some classes of switches

[64] UNEP (2014) The Basel Convention.

[65] UNEP (2014) The Minamata Convention on Mercury.

and relays, soaps and cosmetics, pesticides and biocides, and topical antiseptics), with the provision of extending this phase-out date through exemptions.

- requirement for Parties to address the main sources of atmospheric emissions of mercury (such as coal combustion, mining and smelting of minerals, and cement production)
- development of guidelines on the environmentally sound management of mercury-containing wastes and on the environmentally sound storage of mercury.

F.6 Montreal Protocol[66]

The Montreal Protocol on Substances that Deplete the Ozone Layer phases out the production and consumption of ozone depleting substances in order to reduce their abundance in the atmosphere, and thereby protect the earth's Ozone Layer. The Montreal Protocol was agreed on 16 September 1987 and entered into force on 1 January 1989.

All Parties to the Montreal Protocol take on legally binding obligations to phase out production and consumption of ozone depleting substances. Developed countries Party to the Montreal Protocol are required to phase out the entire production and consumption of the following ozone depleting chemicals (some exemptions are allowed for essential uses or where the chemical is to be used as a feedstock):

- Chlorofluorocarbons (CFC-11, CFC-12, CFC-113, CFC-114 and CFC-115) by January 1996
- Halons (halon 1211, halon 1301 and halon 2402) by January 1994
- Other fully halogenated CFCs (CFC-13, CFC-111, CFC-112, CFC-211, CFC-212, CFC-213, CFC-214, CFC-215, CFC-216, CFC-217) by January 1996
- Carbon tetrachloride by January 1996
- 1,1,1-trichloroethane (methyl chloroform) by January 1996
- HCFCs (consumption) by January 2030
- HCFCs (production) by January 2030
- HBFCs by January 1996
- Bromochloromethane by January 2002
- Methyl bromide by January 2005.

Developing countries have the same obligations to phase out ozone depleting substances but are given longer timeframes (generally ten or more years) to achieve phase out targets.

[66] UNEP (2011) The Montreal Protocol on Substances that Deplete the Ozone Layer.

APPENDIX G THE NATIONAL STANDARD

A National Standard approach to environmental risk management of industrial chemicals is proposed to be the foundation for any of the proposed options, except the base case where current environmental risk management arrangements will remain unchanged. The meaning of Standard in this context is a mechanism by which a Decision Maker or delegate can 'schedule' or assign industrial chemicals to an established set of required risk management actions. This is to ensure that there are nationally consistent risk management outcomes. It is proposed that this would be underpinned by a legislative instrument for Option 2 or Option 3; or via a non-statutory approach under Option 1.

Each industrial chemical that is assessed in Australia for its impact on the environment is proposed to be scheduled or assigned by a Decision Maker to a category, class or schedule under the National Standard based on the chemical's level of concern. The level of concern incorporates consideration of a chemical's environmental risks, inherent hazard characteristics and any relevant socio-economic aspects to its use in Australia. The number of categories, classes or schedules will be developed to allow for a suitably broad scope and flexibility in risk management approaches.

Aside from the intention of achieving better protection of the environment through risk management of industrial chemicals, a Standard approach would provide greater transparency, predictability, certainty and consistency for industry and the community. Specific risk management actions that may apply to chemicals falling into each category would be publicly available and standardised, but maintaining flexibility where required (e.g. "Do not release the chemical to the environment above [a specified concentration]"). This information will enable industry to better understand and engage with the regulatory framework at an early stage.

NICNAS is anticipated to consider the Standard during the chemical risk assessment process and make recommendations on a suitable category, class or schedule for a chemical. Information currently available in an industrial chemical risk assessment will be sufficient to inform a risk management decision. Only chemicals that have been referred by the NICNAS will be considered by the Decision Maker for scheduling under the Standard.

Figure 5-1 in Section 5.1 provides a high level outline of the proposed National Standard involving three primary categories of concern – High, Intermediate and Low Concern. The majority of chemicals are expected to fall in the Low Concern category where limited or no risk management actions are required. Few chemicals are expected to fall into the High Concern category. The percentages of chemicals assessed each year that are expected to fall into each concern category are outlined in Appendix H. General characteristics of chemicals in each concern category are as follows:

Low Concern	• Chemicals that require limited or no risk management for their assessed use • Non-hazardous or low hazard chemicals according to the ICNA Act • Chemicals that are environmentally hazardous[67] to some degree but have low environmental exposure and are low risk • Low concern excludes highly hazardous substances[68]
Intermediate Concern	• Chemicals that require some level of management for their assessed use to prevent potential damage to the environment • Chemicals that are environmentally hazardous and pose a material risk[69] to the environment • Chemicals with potentially hazardous characteristics where the risk to the environment is unknown or unable to be determined with the available information • Intermediate concern excludes PBT chemicals
High Concern	• Chemicals that require stringent risk management to prevent significant, irreversible or costly environmental damage for their assessed use • Chemicals that are PBT • Chemicals that are highly hazardous and have high environmental exposure

Chemicals will be assigned to a particular category, class or schedule in response to a decision on the recommendation made in the chemical's risk assessment. The assignment to a category, class or schedule will be defined based on the assessed use of the chemical. Therefore, it is possible that a chemical with several risk assessments for different uses/exposures may be assigned to different categories, classes or schedules.

G.1 Chemical categorisation and decision making

During an industrial chemical risk assessment conducted by NICNAS, a recommendation is expected to be made to the Decision Maker under the National Standard as to the most appropriate categorisation and risk management actions for the chemical, based on its environmental risks and hazards. The categorisation process will be developed upfront along

[67] Environmentally hazardous substances are those that align with H400, H401, H402, H410, H411, H412, H413 or H420 under the Globally Harmonized System of Classification and Labelling of Chemicals (GHS); or shown to adversely affect the hormone systems in wildlife or humans; or are PB, BT, PT or PBT chemicals; or adversely affect terrestrial life

[68] Highly hazardous substances include, for example, persistent, bioaccumulative and toxic (PBT), PB, BT, PT or very toxic chemicals or chemicals with the potential to destroy ozone in the upper atmosphere.

[69] A 'material risk' in this context is an environmental risk that is considered of substantial import, that is, chemicals for which the environmental risk is considered to be more substantial than 'low risk'

with the Standard. Recommendations in the NICNAS risk assessment reports are expected to be made using the defined categorisation process. The proposed scheduling process is outlined in Figure 5-2 in Section 5.1. Where possible, the Department of the Environment will work with NICNAS to align processes to ensure that the environmental risk management decision making process integrates with the existing timeframes or follows seamlessly whilst limiting time burdens on industry.

To streamline the scheduling process, the consultation period for categorisation and scheduling under the National Standard are expected to coincide with the NICNAS consultation processes that are already in place for both new and existing chemicals following risk assessment:

- For new chemicals, the entity/person notifying the chemical to NICNAS (the notifier) is given fourteen days to request variations to the report on scientific grounds prior to publication. The notifier generally gives written consent to the Director of NICNAS to publish the risk assessment report. However, the Director may also publish the report if no consent is given within 28 days.
- For existing chemicals, full public consultation is undertaken for both priority existing chemicals and chemicals assessed under the IMAP framework.

As the final design of the Standard and processes for chemical categorisation will be publicly available, those being consulted will be able to determine whether the categorisation and risk management actions are appropriate and in line with the Standard.

Following consultation, all High Concern chemicals are expected to be referred to an intergovernmental Working Group (Option 1) or statutory Advisory Committee (for Options 2 and 3) who will review the draft categorisation recommendation, taking into account the environmental risks, the hazards, any other appropriate information, and comments received during consultation. The Working Group/Advisory Committee is expected to meet four to five times per year, on agreed and publicly available dates.

Intermediate and Low Concern chemicals may also be reviewed by the Working Group/Advisory Committee, if requested by industry, the community or governments. However, the Working Group/Advisory Committee will only review a chemical if a request is made and that request is consistent with criteria for review that will be developed along with the National Standard. The Decision Maker may also request review of a chemical by the Working Group/Advisory Committee. If a review by the Working Group/Advisory Committee is not requested, Intermediate and Low Concern chemicals will be forwarded straight to the Decision Maker for scheduling. Considering the transparency of the Standard – and the consultation processes during risk assessment for new chemicals – the number of chemicals requested to be reviewed by the Working Group/Advisory Committee is expected to be limited.

Low Concern chemicals may also be scheduled or listed under the National Standard. However, scheduling decisions for the National Standard will rely on the completion of an industrial chemical risk assessment. Under several of the proposed reform options for NICNAS, chemicals that would be expected to be categorised as Low Concern would not be

assessed by NICNAS. Therefore, the numbers of chemicals recommended to be scheduled as Low Concern may be limited.

Should an industrial chemical risk assessment be completed by NICNAS and a recommendation made that the chemical is Low Concern, these chemicals may also be scheduled or listed under the National Standard. If a review of the categorisation and risk management actions are not requested, the draft recommendation is expected to be forwarded straight to the Decision Maker.

As some Low Concern chemicals may have 'light touch' risk management actions (e.g. 'Neutralise chemical prior to release to the environment'), it is important not to discount their potential scheduling. Scheduling a Low Concern chemical will provide an important record for industry, government and the public to review. It will also highlight the chemicals that have been determined to be Low Concern to the environment and allow industry and the public to make informed choices in chemical and product use. The chemicals that have previously been assessed and the decisions on their level of concern will be able to be reviewed. Scheduling low concern chemicals will also provide government a mechanism to review the effectiveness of the National Standard.

G.2 Timeframes for decision making

To prevent delays and reduce uncertainty in risk management arrangements for assessed chemicals, the decision making process will have agreed and defined timeframes under the National Standard. The Decision Maker may receive a batch of chemicals for scheduling at regular intervals, potentially on a monthly basis. However, appropriate timeframes will be determined during consultation with governments, industry and the community around implementation and may be dependent on the level of advice and consultation requested or required during the decision making process. That is, High Concern chemicals and Intermediate and Low Concern chemicals that have been requested to be reviewed may require longer decision making timeframes as advice and consultation processes may be more extensive.

As the National Standard will have pre-defined risk management actions appropriate to the level of concern of a chemical, timeframes for decision making are expected to be minimal. As the National Standard will be transparent and predictable, risk management decisions may be anticipated prior to chemical notification and this will also streamline the process.

G.3 Information available under the National Standard

For decisions made under the National Standard to be transparent, the general chemical information available to the Decision Maker that informed the decision that was made is proposed to be available as part of the Standard. The Standard will be maintained by the Commonwealth (for options 2 and 3) or as agreed by Commonwealth, states and territories (for Option 1). It is anticipated that scheduling decisions will be publicly available and updated regularly. Information proposed to be available under the National Standard is outlined in Box 12. The information provided along with the scheduling decision will be information that is

publicly available in the industrial chemical risk assessment. Information is expected to be searchable and tabulated for ease of accessibility.

As noted previously, one chemical may be scheduled in several different categories, depending on its use and exposure to the environment. Therefore, it is important for transparency that information such as use and volume is included in the categorisation decision as it is inextricably linked to the decision that was made. This information will also allow industry and the public to review the outcomes under the National Standard and make informed judgements as to potential categorisation results of similar chemicals.

Box 8

Information to be made available under the National Standard

To accompany the categorisation decision made under the National Standard, the following information will be publicly available to support the reasons for the decision:

1. The chemical name/identifier
2. The categorisation result (e.g. Class 1 to Class X)
3. The risk management actions
4. The assessed use of the chemical as published online in the NICNAS risk assessment
5. The assessed volume of the chemical as published online in the NICNAS risk assessment
6. The assessed chemical hazards, if any, as published online in the NICNAS risk assessment
7. Any other information that led to the decision (e.g. “Chemical used in the protection of human life”)

G.4 Outcomes-based risk management

Risk management actions under the National Standard are expected to be outcomes-based. That is, the method of achieving the management of an environmental risk will not be prescribed. For example, an outcomes-based risk management approach may include a risk management action such as:

- Do not allow [*wildlife*] to access [*the chemical*]

This is in contrast to a prescriptive outputs-based approach to achieve the same outcome that may include, for example, a risk management action such as:

- Cover settling ponds with netting to prevent birds accessing water contaminated with [*the chemical*]

Chemical producers and users will have the opportunity to utilise the most effective method for their situation in achieving risk management outcomes. This approach assumes that the chemical producers and users ‘know best’ and will allow continued innovation in environmental protection and also enable industry to keep costs related to risk management as low as possible.

APPENDIX H NUMBERS OF CHEMICALS SCHEDULED UNDER THE NATIONAL STANDARD

Following the Consultation RIS, further analysis has been conducted to determine the likely numbers of chemicals expected to be scheduled under the Standard. Chemicals for which an environmental risk assessment has been completed by NICNAS are expected to be categorised into Low, Intermediate or High Concern and scheduled under the Standard. The numbers of new and existing chemicals assessed each year is assumed to be:

- 150 to 200 new chemical environmental risk assessment reports are prepared by NICNAS per year based on historical assessment data.[70]
- 500 existing chemical assessments per year based on projections of the environmental risk assessments completed as part of the current trial of the IMAP framework and priority existing chemical assessments.

The numbers of chemicals that are expected to fall into each concern category were also reviewed. New Chemicals for which an environmental risk assessment report was completed from 2011 to 2014 were reviewed and the proportions of chemicals categorised as Low, Intermediate and High Concern to the environment was estimated (see Figure H-1).

Chemicals were determined to be Low Concern if they:

- were not assigned a GHS classification; and/or
- did not contain perfluorinated functionality; and/or
- were not released to the environment from the assessed use pattern. This only relates to chemicals that are consumed during use or react to form an insoluble, inert polymeric mass.

High Concern chemicals were estimated based on those withdrawn prior completion of assessment due to concerns raised over PBT properties. No risk management actions are currently available for PBT chemicals and they may have been withdrawn to avoid the burden of complicated assessment processes without a tangible outcome.

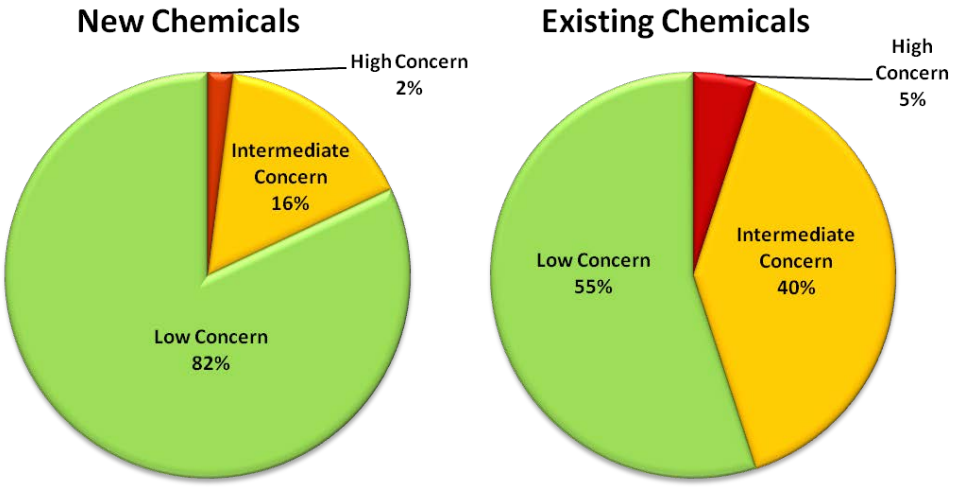
All other chemicals were determined to be Intermediate Concern as they posed a material risk to the environment and were hazardous based on GHS classification.

The likely proportions of chemicals in each concern category for existing chemicals were estimated based on expert advice. As the risk for all of the chemicals listed on the AICS has not been determined, the numbers of existing chemicals is estimated based on the expert opinion of environmental risk assessors of industrial chemicals. The numbers of existing chemicals are likely to be realistic, if not an overestimate. It is expected that the proportion of High and Intermediate Concern chemicals for new chemicals will be lower as industry

[70] The number of new industrial chemicals reported in this RIS is a subset of the new industrial chemicals notified to NICNAS each year. Only those new chemicals for which an environmental risk assessment report was prepared have been included in the total.

recognises the need to move to more sustainable and 'greener' chemistry. Therefore, the numbers of Intermediate and High Concern new chemicals may be overestimated.

Figure H-1: Proposed proportions of Existing and New chemicals in each concern category based on a review of environmental risk assessments



Based on the total numbers of environmental risk assessments that assumed to be completed by NICNAS each year and the proportions in Figure H-1, the numbers of chemicals in each concern category are presented in Table H-1.

Table H-1: Numbers of chemicals in each concern category

	Existing Chemicals	New Chemicals – lower bound limit	New Chemicals – upper bound limit
Low Concern	275	123	156
Intermediate Concern	200	24	40.[71]
High Concern	25	3	4
Total	***500***	***150***	***200***

As discussed in Chapter 6, the numbers of chemicals for which an environmental risk assessment is completed may depend on the outcome of the NICNAS review process. Two scenarios are proposed – one in which the status quo is maintained; one in which the assessment effort is focused on those chemicals that may be categorised as Intermediate or High Concern. The numbers of chemicals expected to be scheduled under each of the scenarios are outlined in Table H-2.

[71] Intermediate Concern chemicals for New Chemicals – upper bound limit are assumed to have a more conservative proportion of 20%

Table H-2: Number of chemicals per year for which a NICNAS environmental risk assessment report is completed

	Existing Chemicals	New Chemicals – lower bound limit	New Chemicals – upper bound limit
NICNAS Scenario 1	**500**	**150**	**200**
Low Concern	275	123	156
Intermediate Concern	200	24	40
High Concern	25	3	4
NICNAS Scenario 2	**225**	**27**	**44**
Intermediate Concern	200	24	40
High Concern	25	3	4

APPENDIX I INTERNATIONAL APPROACHES TO ENVIRONMENTAL RISK MANAGEMENT OF INDUSTRIAL CHEMICALS

I.1 International risk management findings

Environmental risk management of industrial chemicals has evolved significantly over recent decades, and continues to do so. The focus on this environmental risk management has been a move from assessment of chemicals to broader concerns about risks across the lifecycle of a chemical. This is reflected in interest in 'green chemistry' through to greater concerns about chemical waste. It is also reflected in the breadth of responsibilities for agencies such as Environment Canada. The following findings are based on advice prepared for the Department of the Environment by ACIL Allen Consulting.

Risk management in relation to industrial chemicals has two elements. One focuses on the very large number of chemicals that existed before regulations were introduced. Relatively little progress has been made in this area, but some prioritising on the basis of chemical structure has resulted in focus on those chemicals most likely to be a problem. The second focuses on new chemicals. Processes for assessing new chemicals are designed to minimise risks. These are generally similar between the jurisdictions. However the information required to be submitted by notifiers is significantly less in the USA than in the other regions.

Monitoring of chemicals in the environment tends to be undertaken at levels of government below that of the national governments. However there are examples within Canada and the USA where there is some national involvement.

Legislation underpinning environmental risk management varies in coverage and strength. Canada has legislation with wide coverage and powers. However, responsibility for enforcement is delegated to local authorities and other agencies. It is proposed that the following principles could be used to inform Australia's approach to the risk management of chemicals:

- Legislation should authorise the government to impose risk management measures on chemicals that appropriately reflect the assessed risks of those chemicals.
- Risk management of chemicals requires cooperation between departments responsible for the environment and health matters, and between different levels of government.
- Chemicals of concern should be prioritised to allow scarce resources to be focussed on managing those chemicals that are most likely to cause harm to the environment or human health.
- The onus should be on manufacturers and importers of new chemicals to provide the data needed to assess the risk that the chemicals pose to health and the environment. Existing chemicals (i.e. ones already in use) should be prioritised, based on an initial assessment. The highest priority chemicals should undergo a similar risk assessment.
- Risk management strategies should be based on the hazard and exposure characteristics of chemicals.

- Encouraging transparency and data sharing should be a key objective.
- 'Polluter pays principles' should apply in considering how risk assessment and management is funded, while recognising the 'public good' element involved in maintaining an effective system of protection from potentially hazardous chemicals.
- Allowing exemptions for chemicals manufactured or imported in small volumes can minimise the costs of assessing chemicals where their intended use is unlikely to have an impact on the environment or human health.
- The arrangements for managing the risks of chemicals should include a program of monitoring to ensure that human health and the environment is being protected as intended. Any failures to comply should carry penalties.
- There should be a review of the legislation after five years to ensure that it is delivering on its objectives in the way intended.

I.2 SAICM

The Strategic Approach to International Chemicals Management (SAICM) is a voluntary initiative to help countries manage chemicals within their borders to reduce the harmful impact of chemicals on human health and the environment. SAICM builds upon already agreed approaches to chemicals management (such as those outlined under Appendix F: International Obligations) and science-based risk assessment, and seeks to build the capacity of developing countries and economies in transition to safely manage chemicals.

The scope of SAICM covers agricultural and industrial chemicals throughout their life-cycle, but explicitly excludes products such as food additives and pharmaceuticals.

I.2.1 Risk Reduction Text from SAICM[72]

The overall objective of the Strategic Approach is to achieve the sound management of chemicals throughout their life-cycle so that, by 2020, chemicals are used and produced in ways that lead to the minimisation of significant adverse effects on human health and the environment. The objective will be achieved, among other ways, through the implementation of activities set out in the Global Plan of Action.

The objectives of the Strategic Approach with regard to risk reduction are:

- minimise risks to human health, including that of workers, and to the environment throughout the life cycle of chemicals
- ensure that humans and ecosystems and their constituent parts that are especially vulnerable or especially subject to exposure to chemicals that may pose a risk are taken into account and protected in making decisions on chemicals

[72] UNEP and WHO (2006) Strategic Approach to International Chemicals Management: SAICM texts and resolutions of the International Conference on Chemicals Management, pg 15

- implement transparent, comprehensive, efficient and effective risk management strategies based on appropriate scientific understanding, including of health and environmental effects, and appropriate social and economic analysis aimed at pollution prevention, risk reduction and risk elimination, including detailed safety information on chemicals, to prevent unsafe and unnecessary exposures to chemicals

- To ensure, by 2020:

    - that chemicals or chemical uses that pose an unreasonable and otherwise unmanageable risk to human health and the environment risk assessment and taking into account the costs and benefits as well as the availability of safer substitutes and their efficacy, are no longer produced or used for such uses

    - that risks from unintended releases of chemicals that pose an unreasonable and otherwise unmanageable risk to human health and the environment based on a science-based risk assessment and taking into account the costs and benefits, are minimised

- apply the precautionary approach, as set out in Principle 15 of the Rio Declaration on Environment and Development, while aiming to achieve that chemicals are used and produced in ways that lead to the minimisation of significant adverse effects on human health and the environment

- give priority consideration to the application of preventive measures such as pollution prevention

- ensure that existing, new and emerging issues of global concern are sufficiently addressed by means of appropriate mechanisms

- reduce the generation of hazardous waste, both in quantity and toxicity, and to ensure the environmentally sound management of hazardous waste, including its storage, treatment and disposal

- promote the environmentally sound recovery and recycling of hazardous materials and waste

- promote and support the development and implementation of, and further innovation in, environmentally sound and safer alternatives, including cleaner production, informed substitution of chemicals of particular concern and non-chemical alternatives.

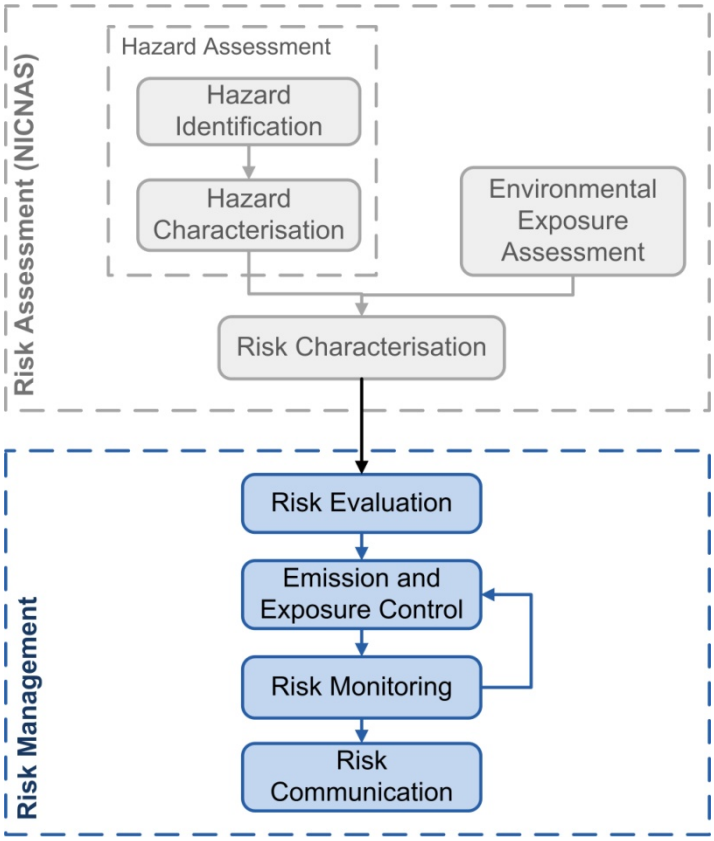
I.3 OECD

Australia contributes to and benefits from collective efforts under the Organisation for Economic Co-operation and Development (OECD) and other international bodies to develop standards and guidelines that help avoid unnecessary duplication and accelerate the management of chemicals globally.

The OECD Risk Management Programme aims to develop methodologies to support government and industry efforts to manage risks posed by chemicals and, when appropriate, to harmonise risk management activities on particular chemicals. The programme includes a variety of themes such as Chemical Product Policy, Using Non-Regulatory Means to Manage Risks, Risk Communication, Socio-Economic Analysis, Sustainable Chemistry, Tools for Research and Development Screening as well as reports on risk management approaches for specific chemicals.

Following an environmental risk assessment, the focus turns to how to control the identified risk. The principles of, approaches to, and terminology related to risk management vary across countries and regions, and are in many cases strongly context dependent.[73] However, the OECD outlines the general risk management process which includes four steps: risk evaluation, emission and exposure control, risk monitoring and risk communication (See Figure I-1).

Figure I-1: Risk assessment and risk management[74]



- ***Risk Evaluation*** is the first step to risk management and consists in determining whether the risk(s) identified at the risk assessment stage need to be mitigated. This can be done quantitatively or qualitatively taking into consideration relevant laws, regulations and policies, societal values, relevant program objectives and socio-economic aspects. The

[73] The OECD Environmental Risk Assessment Toolkit: Steps in Environmental Risk Management and Available OECD Products available on the OEDC website.

[74] Adapted from OECD (2014). The OECD Environmental Risk Assessment Toolkit: Tools for Environmental Risk Assessment and Management available on the OECD website.

objective of this step is to determine whether control measures need to be taken to address specific risks identified at the risk assessment stage.

- ***Emission and Exposure Control:*** Once risk evaluation has been completed and further risk mitigation is thought necessary, the next step is to take measures to control emission and exposure of chemicals for protecting humans and/or the environment. The process includes identifying and analysing options for controlling risks to select the most appropriate measures and to implement them.

  Various approaches for emission and exposure control have been taken and some examples of those include setting safety standards, and technical risk reduction measures. Classification and labelling are used in some countries for risk mitigation by linking them to regulatory measures or particular risk management measures.

- ***Risk monitoring*** plays an important role in environmental and human risk management with the aim of checking that risk mitigation or reduction has worked effectively. The result of risk monitoring is used as a basis for consideration of further risk mitigation options.

- ***Risk communication*** is the interactive exchange of information about risks among risk assessors, managers, news media, interested groups and the general public.

I.4 Canada

The *Canadian Environmental Protection Act, 1999* (CEPA) is the most important legislation available to the Canadian federal government for managing toxic substances. CEPA uses a 'precautionary approach' and focuses on pollution prevention and the protection of the environment and human health in order to contribute to sustainable development. CEPA provides the Canadian federal government with instruments to protect the environment and human health, establishes strict timelines for managing substances found to be 'toxic' under the Act[75], and requires the virtual elimination of releases to the environment of those declared toxic substances that are bioaccumulative, persistent, and anthropogenic. CEPA aims to focus on a shift away from managing individual chemicals towards a systematic, outcomes-focused management approach.

Risk management tools other than those under CEPA are also available to the Canadian federal government. Further, other governments in Canada have a role to play in the management of toxic substances. Environment Canada has committed to considering the range of tools and to recognising jurisdictional roles when it is developing strategies to manage substances that are toxic under CEPA. The CEPA National Advisory Committee, consisting of representatives from provincial, territorial, and aboriginal governments, plays a

[75] Section 64 of CEPA defines a substance as "toxic" if it is entering or may enter the environment in a quantity or concentration or under conditions that: a) have or may have an immediate or long-term harmful effect on the environment or its biological diversity; b) constitute or may constitute a danger to the environment on which life depends; or c) constitute or may constitute a danger in Canada to human life or health.

key role in advising the Canadian federal government on activities under the Act and on cooperative, coordinated approaches to the management of toxic substances.[76]

I.4.1 Chemicals Management Plan[77]

The Chemicals Management Plan (CMP) was launched in 2006 to bring all of Canada's existing federal programs together into a single strategy. The CMP is a science-based approach which aims to protect human health and the environment through:

- setting priorities and government-imposed administrative timelines for action on chemicals of concern
- integrating chemicals management activities across federal departments and choosing the best placed federal statute under which to take action
- enhancing research, monitoring and surveillance
- increasing industry stewardship and responsibility for substances
- collaborating internationally on chemicals assessment and management
- communicating to Canadians the potential risks of chemical substances.

The CMP intensifies timelines for action on chemical substances, setting ambitious objectives to assess and where required, develop risk management strategies for all 'Categorized' existing substances in Canada by 2020.

The Government of Canada implements different risk management tools, ranging from regulatory activity, voluntary actions and public engagement to address current and emerging issues related to risks from chemical substances. The risk management measures are commensurate to the risk that it poses and the most appropriate approach is chosen based on a number of human health, environmental, social and economic considerations in consultation with key stakeholders. Risk managers also consider existing federal laws and programs, as well as laws in provinces and territories, international commitments, and actions taken in other countries. Risk management tools may be used to control any aspect of the life cycle of a substance of concern - from the design and development stage to its manufacture, use, handling, storage, import, export, transport and ultimate disposal. Frequently, more than one measure is used in order to control different aspects of the risks posed by a substance of concern.

I.4.2 Regulatory risk management approaches

Canada has a range of regulatory risk management tools available for management of chemical environmental risks. Some of the risk management actions for toxic chemicals under CEPA include:

[76] Environment Canada (2013) Identifying Risk Management Tools for Toxic Substances Under CEPA 1999, available on the Environment Canada website.

[77] UN (2010) Canada's approach to management of chemicals, available on the UN website.

- Quantity or concentrations released, imported, manufactured, processed, used, sold or contained in products
- Locations where, and activities and conditions under which substances may be released
- Purposes for and manner of import, manufacture, processing, use and sale
- Total, partial or conditional prohibition of import/export, manufacture, use, processing and sale.

Canada aims for regulatory efficiency by building flexibility into regulations which can manage a number of different substances with targeted regulatory controls. For example, the *Prohibition of Certain Toxic Substances Regulations, 2005* prohibits the manufacture, use, sale, offer for sale and import of substances as listed in Schedules to the Regulations. Schedule 1 of these regulations lists substances subject to total prohibition (with the exception of incidental presence), while Schedule 2 of these regulations specifies substances that are subject to prohibitions of concentration or use. This facilitates more flexible management of the scheduled substances, and also facilitates the addition of new substances to the two schedules in the future.

Some specific aspects of regulatory risk management approaches under CEPA are detailed further below.

I.4.2.1 Administrative Agreements[78]

Administrative Agreements are working arrangements between the Canadian federal government and provincial and territorial governments to streamline efforts in administering regulations. The agreements usually cover inspections, enforcement, monitoring and reporting, and so forth, with each jurisdiction retaining its legal authorities.

I.4.2.2 Canada-wide Standards[79]

Canada-wide Standards (CWSs) are intergovernmental agreements that represent co-operation to work toward a common goal. CWSs flow from a political commitment by federal, provincial and territorial Ministers to address key environmental protection and health risk issues that require concerted action across Canada.

CWSs are based on science, but also take into consideration technical feasibility and socio-economic factors. They can include qualitative or quantitative standards, guidelines, objectives and criteria for protecting the environment and reducing risks to human health. The focus of the Canada-wide Environmental Standards Sub-Agreement is on standards that recommend levels or concentrations of substances in the surrounding environment. The levels or concentrations contained in the standards are generally those that provide protection for the environment and human health and are technologically and economically achievable. It is also possible to tailor Canada-wide standards to the specific priorities (for example, standards for

[78] Environment Canada (2010) Administrative Agreements, available on the EC website.

[79] Environment Canada (2014) Canada-wide Standards, available on the EC website.

products, discharge limits for a substance from a particular source or type of source such as steel-plants, emission reductions). Generally, each standard includes a target, a time frame for achieving the target, a list of governments' initial actions towards achieving the standard, and a protocol for reporting to the public on progress achieved.

I.4.2.3 Pollution Prevention Plans[80]

Pollution prevention under CEPA is the use of processes, practices, materials, products, substances or forms of energy that avoid or minimise the creation of pollutants and waste, and reduce the overall risk to the environment or human health.

Pollution prevention planning is a process to examine current operations and develop a plan to eliminate or reduce pollution at the source. By developing pollution prevention plans facilities are able to identify options according to the environmental protection hierarchy (prevention, reuse/recycle, treatment, control, waste disposal), evaluate these options and implement them within a specified time frame. Pollution prevention planning places emphasis on identifying the most cost-effective options, including those where facilities can see a return on investment.

Pollution prevention panning may include consideration of the following, for example:

- Substitution to alternatives
- Product design for waste reduction
- Process efficiency
- Reuse and recycling
- Personnel training and education
- Technology improvements

I.4.3 Other risk management approaches

I.4.3.1 Environmental Performance Agreements[81]

An environmental performance agreement is an agreement with core design criteria negotiated among parties to achieve specified environmental results. A performance agreement may be negotiated with a single company, multiple companies, regional industry associations, a sector association or a number of sector associations.

I.4.3.2 Codes of Practice[82]

Codes of practice are voluntary instruments that identify recommended procedures and practices or environmental controls relating to works, undertakings, and activities, including

[80] Environment Canada (2014) Pollution Prevention, available on the EC website.

[81] Environment Canada (2014) Environmental Performance Agreements, available on the EC website.

[82] Environment Canada (2013) Codes of Practice, available on the EC website.

any subsequent monitoring activities. These set out official national standards that companies and organisations should follow.

I.4.3.3 Economic Instruments

The Government of Canada use economic instruments to promote environmental excellence while also fostering economic growth. Economic instruments are used to complement or substitute traditional regulatory measures to use the market to induce behavioural changes. Some instruments used by Canada are environmental taxes, tax incentives for voluntary compliance, tradable permits, and subsidies.

I.5 European Union

In the European Union (EU), chemical substances are managed under REACH, an integrated system for the Registration, Evaluation, Authorisation and restriction of Chemicals. REACH is intended to promote the development of less hazardous substances that can replace existing substances. The EU takes the position that voluntary measures on chemicals management are insufficient and that clear requirements will foster greater innovation and competitiveness. Furthermore, the EU has evaluated the costs and benefits of the proposed legislation, concluding that estimated costs to the economy (and particularly the chemicals industry) are considered manageable and strike an appropriate balance relative to projected benefits to human health and the environment.[83]

I.5.1 Regulatory risk management approaches[84]

REACH requires firms that manufacture and import chemicals to evaluate the risks resulting from the use of those chemicals and to take the necessary steps to manage any identified risk. Industry has the burden of proving that chemicals produced and placed on the market are safe.

The European Chemicals Agency (ECHA) is responsible for managing the technical, scientific and administrative aspects of REACH and ensuring consistency of decision-making. The ECHA also manages the registration process and plays a key role in the evaluation process. It receives applications for authorisation and delivers opinions and issues recommendations in relation to the authorisation and restriction procedures.

The scope of the REACH regulations covers all substances[85], whether manufactured, imported, placed on the market, or used on their own or in mixtures.

[83] Parliament of Canada (2006) International Management of Chemicals.

[84] EUR-Lex – Access to European Union Law.

[85] REACH excludes radioactive substances, substances under customs supervision which are in temporary storage with a view to re-exportation or still in transit, non-isolated intermediates, the transport of dangerous substances, and waste. All of these substances are covered elsewhere in European legislation.

I.5.1.1 Registration

Registration is the key component of the REACH system. It is compulsory to register chemicals that are manufactured or imported in quantities of one tonne or more per annum. If a substance is not registered it cannot be produced or placed on the European market. By June 2018, all chemicals[86] on the European market will be registered under REACH.

Registration requires the industry (manufacturers and importers) to provide information on the properties and uses of chemicals and the precautionary measures to be taken when using them (technical dossier). The data required are proportional to the production volume of and the risks presented by the substance concerned. An application to register a substance which is imported or manufactured in a quantity of 10 tonnes or more per year must include a Chemical Safety Report - a detailed description of the risks associated with that substance and the different possible exposure scenarios and risk management measures.

ECHA is responsible for managing the database, receiving registration dossiers and developing technical guides aimed at helping manufacturers, importers and the competent authorities in implementing these provisions.

I.5.1.2 Evaluation

Evaluation makes it possible for ECHA to check that industry is fulfilling its obligations and avoiding tests on vertebrate animals when unnecessary. If a substance is suspected of posing a risk to human health or the environment, ECHA will include this substance in a specific list and a designated Member State will carry out an evaluation in order to determine whether further information is required from the registrant.

Evaluation can lead to the following conclusions:

- the substance must be subject to restriction or authorisation procedures;
- the classification and labelling of the substance must be harmonised;
- information must be supplied to the other authorities so that they can adopt appropriate measures. For example, if, while the substance is being evaluated, information on risk management measures become available and could have an impact on the conditions of use of that substance, the information should be transmitted to the authorities responsible for this legislation.

I.5.1.3 Authorisation

Substances of extremely high concern may be subject to authorisation by the European Commission with regard to particular uses. The objective is to ensure that the risks linked with these substances are validly controlled and that these substances are gradually replaced by

[86] All chemicals will be registered with the exception of polymers; some substances where the estimated risk is negligible (water, glucose, etc.); naturally occurring, chemically unaltered substances; substance for research and development under certain conditions.

other appropriate substances or technologies where this is economically and technically viable.

ECHA publishes and regularly updates a list of substances ('list of candidate substances') identified as having characteristics of extremely high concern. These may include the following:

- CMRs (carcinogens, mutagens and reproductive toxins);
- PBTs (persistent, bioaccumulative and toxic substances);
- vPvBs (very persistent and very bioaccumulative substances);
- some substances of concern which have irreversible serious effects on humans and the environment, such as endocrine disruptors.

Any placing on the market and use of listed chemical substances is subject to authorisation. This is granted if the risks arising from the substance in question can be validly controlled. If they cannot and if no alternative exists, the European Commission assesses the level of risk and the socio-economic advantages of using the substance and decides whether to authorise it. Some substances, such as PBTs and vPvBs can be authorised only if the socio-economic advantages override the risks and there are no alternatives.

The burden of proof is placed on the applicant. All authorisations must be reviewed after a certain period of time that is determined on a case-by-case basis.

I.5.1.4 Restriction

The restriction procedure makes it possible to manage the risks which are not adequately covered by other provisions of the REACH system. Proposed restrictions may relate to the conditions of manufacture, use(s) and/or placing on the market of a substance, or the possible prohibition of such activities, if necessary. They are suggested by Member States or by ECHA (at the European Commission's request) in the form of a structured dossier and decided on by the European Commission.

I.6 United States of America

The *Toxic Substances Control Act* 1976 (TSCA) is the main legislation dealing with the manufacture, import, use and distribution of chemical substances in the United States (US). The US also has a substantial number of other Acts related to specific areas of chemical risk management such as the Clean Air Act, the Clean Water Act, and the Federal Food, Drug and Cosmetic Act.[87]

[87] US General Accountability Office (2005) Report to Congressional Requesters: Chemical Regulation – Options Exist to Improve EPA's Ability to Assess Health Risks and Manage Its Chemical Review Program, available on the GAO website.

I.6.1 Regulatory Risk Management Approaches[88]

The TSCA authorises the US Environmental Protection Agency (EPA) to review and manage chemical substances before and after they enter the market. Industry is required to notify the US EPA in advance of the production or import of a new substance, and to provide various types of information that the US EPA can use to determine risk. Any data suggesting that a chemical poses a substantial risk must be reported. The US EPA may review chemicals to determine whether they pose an "unreasonable risk," in which case various actions are available to the Agency to ban, restrict, or otherwise manage them[89]. In the case of existing substances, the US EPA must find that "a reasonable basis exists to conclude that the chemical presents or will present an unreasonable risk to human health or the environment" and choose the "least burdensome" regulation that adequately addresses the risk. The US EPA must also consider the costs and benefits of the proposed regulation.

The US government also has the power to refuse entry into the US of a shipment of any chemical substance or mixture that fails to comply with the requirements under the TSCA. TSCA also requires a person who exports or intends to export a chemical substance or mixture that is subject to certain TSCA regulatory actions to notify the US EPA of the export. For most enforcement cases under TSCA, the Agency pursues an administrative civil penalty action in order to expeditiously receive a monetary penalty and remedy the violation.

The TSCA also allows for individual states to regulate chemicals not already controlled under federal regulations. Accordingly, some states have passed legislation to restrict specific brominated flame retardants and other states, such as Maine and California, are developing their own chemicals policies. While such regulation may be progressed more quickly at the state level, this may result in inconsistent regulation.

I.6.1.1 New Industrial Chemicals

Through the New Chemicals Program, the US EPA manages the potential risk from chemicals new to the marketplace by setting conditions, up to and including a ban on production or import, on the manufacture, processing, use and disposal of a new chemical before it enters into commerce. Anyone who plans to manufacture or import a new chemical substance for a non exempt commercial purpose is required to provide the US EPA with notice before initiating the activity.

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[88] US General Accountability Office (2005) Report to Congressional Requesters: Chemical Regulation – Options Exist to Improve EPA's Ability to Assess Health Risks and Manage Its Chemical Review Program, available on the GAO website; Parliament of Canada (2006) International Management of Chemicals.

[89] Reviews by the US General Accounting Office (GAO; renamed "Government Accountability Office" in 2004) found that a combination of legal, procedural and financial constraints had seriously limited the US EPA in exercising its authorities under the TSCA, particularly with respect to controlling existing substances. It found that the US EPA was often unable to access adequate data sets, had regulated few chemicals and had not fully assessed risks. One of the main problems the GAO identified was that the burden of acquiring data with respect to the toxicity of chemicals rested with the US EPA and that "EPA officials say the act's legal standards are so high that they have generally discouraged [the] EPA from using its authorities to ban or restrict the manufacture or use of chemicals." A number of Acts aimed at improving chemicals management have since been introduced. However, the complexity of chemical regulation has increased.

Notice is also required before beginning any activity that the US EPA has designated as a "significant new use" of a new or existing chemical. These notices must contain information on the specific chemical identity, use, anticipated production volume, exposure and release information, and existing available test data.

I.6.1.2 Existing Chemicals

The US EPA has announced a comprehensive approach to enhancing the current existing chemicals management program. The enhanced program includes the following activities:

- Initiating regulatory risk management actions on lead, mercury, formaldehyde, polychlorinated biphenyls (PCBs), glymes and nanomaterials.
- Requiring information needed to understand chemical risks by: requiring that companies submit information to fill the remaining gaps in basic health and safety data on high production volume (HPV) chemicals; and making the reporting of chemical use information more transparent, more current, more useful, and more useable by the public.
- Developing action plans designed to target US EPA risk management efforts on chemicals of concern.

I.6.2 Other Risk Management Approaches

The American system often relies on voluntary and incentive programs to compel actions in the public interest, including the High Production Volume (HPV) Challenge Program, the Voluntary Children's Chemical Evaluation Program (VCCEP), Persistent, Bioaccumulative and Toxic (PBT) Chemical Program, Sustainable Futures Voluntary Pilot Project, and various programs that generate and make available certain information on risk, exposure and potential effects of toxic substances. The intention is to encourage companies to reduce and prevent pollution.[90]

I.6.2.1 Pollution Prevention

Pollution prevention reduces or eliminates waste at the source by modifying production processes, promoting the use of non-toxic or less-toxic substances, implementing conservation techniques, and re-using materials rather than putting them into the waste stream. The US EPA has several programs for pollution prevention such as the Green Chemistry Program, Green Engineering Program and Chemical Management Services.

I.6.2.2 Information Collection and Access

The US EPA has a number of programmes for information collection and access. The most well-known is the High Production Volume (HPV) Challenge Program that "challenges" companies to make health and environmental effects data publicly available on chemicals produced or imported in the US in quantities of 1 million pounds or more per year. The programs also include:

[90] Parliament of Canada (2006) International Management of Chemicals.

- Chemical Substance Inventory Update Reporting: companies that manufacture or import chemicals may be required to periodically report information, such as the identity of the chemical, the amounts manufactured or processed, and certain details about their manufacture.
- Nanoscale Materials Stewardship Program: helps provide a firmer scientific foundation for regulatory decisions by encouraging submission and development of information, including risk management practices, for nanoscale materials.
- Envirofacts: a single point of access to EPA environmental data with information about environmental activities that may affect air, water, and land anywhere in the US.
- Toxics Release Inventory (TRI): the US pollutant release and transfer registry

I.7 Comparison of risk management in each region

Risk management approaches and capabilities in each of the regions discussed above are outlined in Table I-1.

Table I-1: Comparison of the main aspects of risk management in each region

	Canada	EU	USA
Precautionary Principle used?	Yes	Yes	No
Chemicals classified according to hazard or risk?	Yes	Yes	Yes
Voluntary or Mandatory approaches to risk management	Both	Mandatory	Focus on voluntary and incentive programmes
Data provision and Burden of Proof	Industry	Industry	Government
Public access to information?	Summarised information available	Yes	Some under Freedom of Information requirements
Compliance and Enforcement	Environment Canada and provincial authorities	Member States	Federal and State regulators

APPENDIX J IMPACT ANALYSIS

J.1 Impact analysis methodology and limitations

To support the Decision RIS, the Centre for International Economics (CIE) was commissioned to complete a cost benefit analysis (CBA). This analysis highlighted the challenges in presenting a traditional cost benefit analysis for the Decision RIS, due to a lack of information regarding the current environmental impacts of industrial chemicals on a national scale and the potential changes to chemical usage as a result of the reforms.

As described in the Productivity Commission Report: '*assessing the effectiveness of environmental protection regulation in reducing the impact of chemicals on the environment is a difficult task. There are little data on environmental outcomes in Australia, let alone data specifically relating to the impact of chemicals.'*[91]

The Standard relates to a change in the decision making and governance framework on industrial chemicals from a fragmented inconsistent system to a nationally consistent approach. The Standard would result in decisions (on specific risk management actions) to change the regulation of specific chemicals. It is these future regulatory changes that would impact on businesses, government and the environment.

The difficultly arises in identifying the impacts on business and the community from the reforms, predicting the impacts over the life of regulation and monetising the impacts. In summary, the major information gaps are described below.

- No informed base case i.e. the environmental impact of chemicals nationally is unknown, however, where there is data, the environmental impact is significant
- Type, volume and distribution of chemical usage in Australia is unknown
- National applicability makes it difficult to define and describe the environmental impacts therefore limiting the ability to define the 'environmental asset'
- The National Standard has not yet been developed and each future risk management action for each chemical scheduled cannot be quantified as a cost to industry
- As the environmental impacts of both new and existing chemicals are largely unknown, the extent to which the proposed Standard will change the environmental impacts is uncertain
- The chemicals that will be assessed against the Standard are unknown.

These factors result in a greater than usual level of uncertainty in conducting a cost benefit analysis for a regulatory change.

These challenges have also been faced by other countries who have attempted to quantify the costs and benefits associated with regulatory change. The studies on the impact of the European Union's Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) programme have highlighted significant uncertainty regarding its estimates. It was

[91] The Productivity Commission noted in its 2008 report, page 243.

stated that the characterisation of the baseline is very difficult at a broader scale due to a lack of knowledge and information.

The main reasons stated were the lack of information on[92]:

- Cause-effect links of dangerous substances
- Volumes, types of uses, amounts of emissions and their pathways as well as exposures
- Geographical distribution of emissions
- Extent of damage caused to the environment by exposures to chemicals at present
- Monitoring data.

J.1.1 Time Period and Discount Rate

The costs associated with developing and implementing the Standard include:

- upfront costs associated with developing the Standard and making the necessary legislative and administrative changes
- ongoing cost of the associated processes.

The (net) benefits of better regulation will accumulate over time as more and more chemicals are assessed against the Standard.

Given there are significant upfront costs associated with establishing the Standard and making the necessary legislative and administrative changes, the costs and benefits have been estimated over a ten year period.

It has been assumed that it would take two years to establish the Standard and make the necessary legislative and administrative changes. The ongoing costs of the associated processes would therefore commence in the third year.

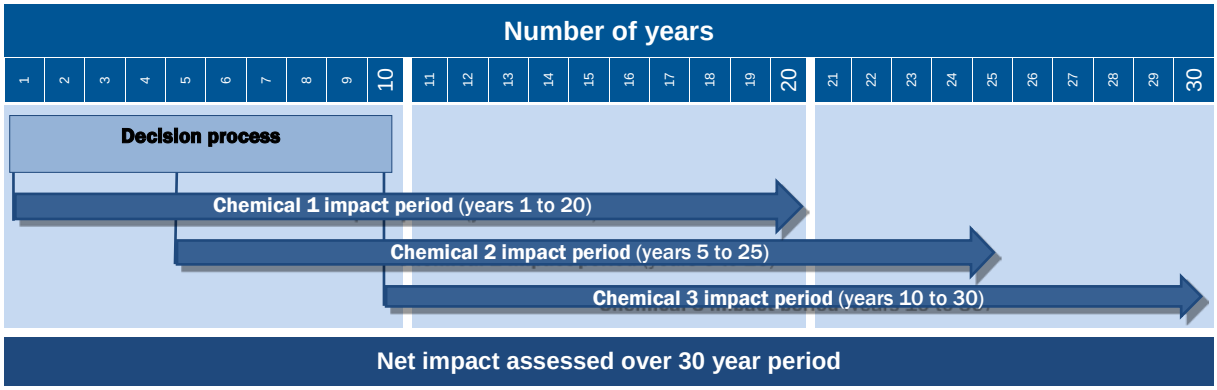
One of the key benefits from the reforms is avoiding or reducing the risk of environmental harm. These benefits are likely to extend well beyond the ten year regulatory period. For example, the environmental benefits of decisions made in the tenth year of the regulatory period are unlikely to be realised until many years later. The costs and benefits of the decisions made during the regulatory period (including the environmental benefits and the ongoing compliance costs incurred by businesses and regulators) are therefore estimated over a 20 year period from the decision point.

This can be interpreted as the lifetime (net) benefits of the decisions made during the ten year regulatory period. These timelines are illustrated in Figure J-1 below. Based on this the evaluation period extends over a 30 year period (from 2016 to 2046).

[92] Ökopol (2007), Analysis of Studies Discussing Benefits of Reach, February, p.18

When comparing costs and benefits across different time periods, it is necessary to discount future benefits and costs back to a 'present value'. Future benefits and costs are discounted using a discount rate of 7 per cent (and 3 per cent and 10 per cent as low and high alternatives).

Figure J-1: Evaluation Period



J.1.2 Two alternative methodologies for environmental benefits and additional industry compliance costs

To be able to quantify aspects of the reforms that are not easily monetised, or extrapolated to a national scale over a large number of chemicals, two approaches to quantify the impacts were undertaken.

- A top down approach — this approach focuses on looking at the overall size of the problem the proposal is trying to solve and then considering to what extent the Standard and associated processes will address this problem.
- A bottom up approach — this approach focuses on establishing the net benefits/costs of changes to the status quo on a per chemical basis and extrapolating across all chemicals assessed using the Standard every year

These approaches were applied to estimate the environmental benefits and the potential additional compliance costs to industry as a result of the proposed options.

Other costs and benefits such as benefits to human health and government costs are considered separately.

J.1.2.1 Bottom up approach based on the Case Studies

As has been highlighted, the impact analysis is assessing a change to the decision making and administrative framework around industrial chemicals. The task is challenging as the National Standard has not yet been developed and the chemicals that will be assessed against the Standard in the future are unknown. This is also complicated by the key uncertainty which relates to the environmental impact of chemicals and how more (or less) stringent regulation will change the environmental outcomes.

Therefore, illustrative case studies based on existing chemicals were chosen to represent a certain level of concern that could be posed to the environment and were assigned illustrative

risk management actions. As information on the use patterns and distribution and impact on the environment of industrial chemicals if not widely known, examples were chosen that demonstrate that there is likely to be an impact on the environment if not managed properly.

The case study chemicals were selected on the basis that they:

- represented a range of risk management actions that could be costed in the CBA
- have readily-accessible, contemporary and relevant information on use, exposure and environmental effects following a simple internet search (e.g. NICNAS assessment reports)
- clearly fall into each concern category
- may have been subject to relevant environmental management recommendations or site remediation projects in Australia that can contribute known costs to the CBA.

Taken at face value, the case studies demonstrated little benefit as risk managers are already implementing similar regulations to the illustrative risk management actions to that which would be proposed under the Standard. These case study chemicals were specifically chosen on the basis that some information is available on them. However, this also meant that state and territory regulators are aware of the impacts and are already taking steps to address the issue. This is not likely to be representative of all existing chemicals or new chemicals.

However, these examples can be used as an indicator of the possible environmental benefits and costs to industry across high and intermediate concern chemicals. It was found that the costs and benefits of these changes will depend on a wide range of factors and can therefore vary considerably. Extrapolating from case studies up to an aggregate estimate will therefore be highly sensitive to the case studies used and how they are weighted.

The following is an overview of the illustrative case studies considered in the analysis:

- Short chain chlorinated paraffins (SCCP) were included as an example of where additional regulation of some chemicals could outweigh the benefits. This is due to the fact that SCCP are already in limited use. However, it is unlikely that the Standard would lead to over-regulation of a significant number of chemicals due to the concern based approach.
- A hypothetical scenario based on PFOS has been tested to give indicative benefits and costs if the Standard was able to prevent the existing legacy issues.
- A hypothetical scenario based on Perc has been tested to give indicative benefits and costs if the Standard was able to prevent the existing legacy issues.
- Sodium cyanide has been used as an example of the Standard aligning with existing requirements set by government regulators. It is plausible that some national scheduling decisions will not have a material impact on the way some chemicals are regulated. It is therefore reasonable to include this case study.

Table J-1: Indicative estimates of the lifetime[a] impact of the Standard on high and intermediate concern chemicals

	Environmental benefits	Costs to industry	Net benefit/cost
	$'000	$'000	$'000
High concern chemicals			
Short chain chlorinated paraffin	94.3	- 511.7	- 417.3
PFOS	5530.2	-2 278.9	3251.3
Average	**2 812.2**	**-1 395.3**	**1417.0**
Intermediate concern chemicals			
Perc[b]	20 770.3	-17 666.6	3103.7
Sodium cyanide	0.0	0.0	0.0
Average	**10 385.1**	**-8 833.3**	**1 551.8**

a Lifetime impacts are expressed in net present value terms over 20 years, using a discount rate of 7 per cent.
b For the purposes of this example, a avoided cost of 5.5 million is assumed with a probability of 0.005%.
Source: CIE estimates.

These per chemical estimates are scaled up based on the number of new chemicals assessed as intermediate or high concern that are likely to be scheduled under the Standard in each year (refer to Appendix G for further information). These values are then converted to present value terms over a ten year period (using a discount rate of 7 per cent), assuming the Standard is implemented from the third year onwards (Table J-2).

Table J-2: Indicative net benefits – bottom up approach

	Environmental benefits	Costs to industry	Net benefit/cost
	$ million	$ million	$ million
Annual benefits/costs[a]			
High concern chemicals	10	-5	5
Intermediate concern chemicals	345	-294	51.6
Total	**355**	**-299**	**56.6**
Net present value[b]			
High concern chemicals	51	- 25	25.9
Intermediate concern chemicals	1801	-1531.8	269.1
Total	**1852**	**-1557**	**294.98**

a Represents the lifetime benefits (over 20 years in present value terms, using a discount rate of 7 per cent) of new chemicals assessed using the Standard.

b Estimated over a ten year period using a discount rate of 7 per cent, assuming the Standard is implemented from the third year onwards.

Source: CIE estimates. Note: Numbers may include rounding errors.

To estimate the costs and benefits associated with each option, consistent with the Consultation RIS it is assumed that under Option 1, 60 per cent of national decisions are implemented by jurisdictions. It is assumed that the net benefits to the community are the

same under Option 2 and 3. If the case study chemicals are broadly representative of the chemicals in each concern category, this would imply that:

- The net benefit could be around $177 million in net present value terms over ten years (using a discount rate of 7 per cent) under Option 1
- The net benefit could be around $295 million in net present value terms over ten years (using a discount rate of 7 per cent) under Option 2 and $295 million for option 3 (Table J-3).

Table J-3: Implied net benefits/costs (bottom up approach)

	Option 1	Option 2	Option 3
	$ million	$ million	$ million
Environmental benefits	1111	1852	1852
Costs to industry	-934	-1557	-1557
Net benefit	**177**	**295**	**295**

Note: Estimates expressed in present value terms over ten years, using a discount rate of 7 per cent. Numbers may include rounding errors.
Source: CIE estimates.

J.1.2.2 Top down approach

An alternative approach to estimating the potential benefits of better regulation is a 'top down' approach. In this approach, information has been compiled on the extent to which industrial chemicals are imposing a cost on the community. By then making a reasonable assumption on the extent to which the Standard could reasonably be expected to address this problem, this gives a reasonable estimate of the magnitude of the environmental benefits the Standard could deliver.

There have been a wide range of high profile land contamination incidents that have required substantial cleanup costs. However, there are a large number of smaller contamination incidents (some related to the case study chemicals) where significant remediation costs have been incurred. The costs regarding these sites are less well known given that many of the costs are incurred by owners of the contaminated sites and there is no public record of these costs. Nevertheless, costs are available for a range of sites and these can be extrapolated across all contaminated sites.

A recent RIS by the NSW EPA estimated that the cost of assessing and remediating contaminated sites in NSW is around $100-$200 million per annum.[93] Extrapolating up to a national estimate based on NSW's share of national economic activity (currently around 31 per cent) suggests that the total cost of assessing and remediating contaminated sites could be around $318 million and $636 million per year nationally.

[93] NSW EPA (2013), Regulatory Impact Statement – proposed Contaminated Land Management Regulation 2013, p.2.

Not all of these costs will directly relate to sites contaminated by industrial chemicals. However, this estimate does not include the costs associated with not being able to use some sites while they are being remediated or the potential impacts on the environment (and potentially human health) of contaminated sites that have not been identified by the environmental regulator. The costs are therefore likely to be towards the top end of this range.

While some sites can become contaminated due to an 'incident', many become contaminated over time. This suggests that the benefits of decisions made now may not be realised until sometime in the future. Therefore it is assumed that better regulation of chemicals reduces site remediation costs in 20 years.

While the Standard may be able to avoid some of these costs it is unrealistic to expect that it could avoid all of them. In the evaluation of the REACH program, a 10 per cent effectiveness rate was assumed. This information implies that the introduction of the Standard could be expected to reduce remediation costs in 20 years by around $69 million. In present value terms, this is $13 million (using a discount rate of 7 per cent).

Table J-4: Implied net environmental benefits/costs to the community

	Low estimate	Mid-point	High estimate
	$ million	$ million	$ million
Annual benefits[a]			
Reduced remediation costs	9	13	18
Present value[b]			
Reduced remediation costs	46	69	92

[a] Represents the lifetime benefits (over 20 years in present value terms, using a discount rate of 7 per cent) of all chemicals assessed using the Standard in each year.

[b] Estimated over a ten year period using a discount rate of 7 per cent, assuming the Standard is implemented from the third year onwards.

Note: Numbers may include rounding errors.

The potential benefits described above are considered to be more realistic than those documented in the bottom up approach as they have not been extrapolated on a per chemical basis. To estimate the likely costs to industry associated with a net benefit of this magnitude, it has been assumed that the ratio between the benefits in Table J-4 and the benefit to the environment seen in the bottom up approach can be used as a scaling factor. This scaling factor was calculated to be 0.037[94].

A comparison of the bottom up and top down approaches highlights the difficulty involved in estimating the net impact of thousands of future decisions related to environmental risk management of industrial chemicals. However, this reflects the inherent uncertainty involved in estimating the net impacts of a new decision making framework, as opposed to changes to the regulation of specific chemicals. Importantly, in both of these approaches, the overall result was a significant net benefit. This comparison does not take into consideration other benefits

[94] Calculated by dividing the mid point annual benefit from the top down approach of $13 million by the annual benefit from the bottom up approach of $355.1 million.

such as harmonisation or public health benefits or costs to government. These are described in Section J.2 and summarised in Section J.3.

Table J-5: Implied net environmental benefits/costs to the community

	Environmental Benefits	Cost to industry	Net benefit/ cost
	$ million	$ million	$ million
Annual benefits[a]			
Bottom up approach	355	-299	57
Scaled top down approach	13	-11[c]	2
Present value[b]			
Bottom up approach	1852	-1557	295
Scaled top down approach	69	-58[c]	11

[a] Represents the lifetime benefits (over 20 years in present value terms, using a discount rate of 7 per cent) of all chemicals assessed using the Standard in each year.

[b] Estimated over a ten year period using a discount rate of 7 per cent, assuming the Standard is implemented from the third year onwards.

[c] Bottom up estimate multiplied by the scaling factor 0.037.

Source: CIE estimates. Note: Numbers may include rounding errors.

There are several factors that could partially explain the discrepancy. Most obviously, the bottom up estimates are driven to a large extent by estimates relating to the hypothetical scenarios for high and intermediate concern chemicals. It is unlikely that these chemicals are representative of all new or existing chemicals within these concern categories. The fact that the case studies show that the impact of the Standard on chemicals within each concern category vary significantly highlights the difficulties in extrapolating up from a small number of case studies.

When extrapolated across all new industrial chemicals scheduled under the Standard, this implicitly assumes that the Standard will be able to prevent all environmental impacts from industrial chemicals. By contrast, the top down approach assumes only a 10 per cent rate of effectiveness (based on the REACH study).

These factors help to explain part, but not all of the discrepancy between the estimates. Overall, the top down estimates are likely to be more realistic. While these estimates are also subject to significant uncertainty, they are grounded in robust cost estimates of actual experiences in the total cost of site remediation in NSW and other jurisdictions.

In addition to these avoided site remediation costs, there are likely to be some public health benefits through reduced exposure to industrial chemicals in the environment. Note that direct exposure to chemicals in the workplace is not relevant to this study as this is regulated through occupational health and safety laws. To our knowledge, there are no Australian studies that estimate the overall health costs to the community of exposure to industrial chemicals in the environment.

However, data from the REACH program has been used as an estimate. The analysis presented that with the implementation of REACH there was the opportunity to avoid certain costs in the future, for example for contaminated land, water treatment and human health

impacts. REACH was assumed to be able to reduce these costs by 10 per cent which resulted in estimated benefits of between €150-500 million in year 2017 (approximately A$215-A$715 million in that year assuming €1 = A$1.43 as at November 2014). This equates to between $0.43 and $1.43 per person assuming the population of the EU is 500 million persons. If this is scaled to the Australian population (23.13 million in 2013) this generates annual health benefits of between A$10 million and A$33 million, assuming a National Standard will have a similarly proportionate impact on the Australian environment.

Over a 10 year period this generates health benefits in present value terms of between A$52 million and A$173 million, assuming that the benefits are realised from year 3 onwards. The mid point value of A$112 million has been used as an estimate of the potential benefit to the community of implementation of the proposed options.

J.2 Key assumptions for monetised costs

J.2.1 Costs of National Standard Development

Under all options, there will be a National Standard. Both the Commonwealth and state and territory governments will be subject to upfront cost of developing the Standard in all options.

It is proposed that the Commonwealth Government provides the Standard's Secretariat. The resourcing for the Secretariat during National Standard development is expected to include:

1 FTE at APS6 level for 1.5 years and 0.5 FTEs at EL1 level for 1.5 years.

In addition to providing the Secretariat, the Commonwealth would fund a consultancy to draft the Standard. This is estimated to cost around $250 000.

State and territory governments would also have input into the development of the Standard. It is estimated that this would require 0.2 FTEs from each state and territory government over an eight month period.

Based on the average total remuneration at relevant Australian Public Service levels, it is estimated that the Standard development costs would be approximately $825 000 in total (in nominal terms) (Table J-6). This includes costs of around $621 000 incurred by the Commonwealth Government and around $203 000 incurred by state and territory governments.

Table J-6: National Standard Development costs

Level	Annual salary	Annual salary + oncosts[b]	FTEs	Period	Total cost
	$	$	No.	Years	$
Commonwealth Government					
Secretariat (EL1)	127 092[a]	190 638	0.50	1.50	142 979
Secretariat (APS 6)	101 487[a]	152 231	1.00	1.50	228 346
Initial consultancy					250 000
Total					621 324
State and Territory Governments[c]					
Cost per state and territory government	127 092	190 638	0.20	0.67	25 418
Total					203 347
Total					**824 671**

[a] Based on average total remuneration at relevant level, which includes base salary, agency superannuation contribution, motor vehicles costs/Executive Vehicles Scheme or cash in lieu of motor vehicle, motor vehicle parking, any other benefits and supplementary payments and bonuses (including individual performance, retention and productivity bonuses as well as whole-of-agency or group bonuses).

[b] Assumes on-costs at 50 per cent of salary.

[c] The annual salary of state and territory government representatives is assumed to be equivalent to an APS EL1 level. *Source:* Australian Public Service Commission, 2014, Australian Public Service Remuneration Report 2013, p. 19.

J.2.2 Cost of legislative and administrative changes

Costs to the Commonwealth Government are expected to include:

- staff costs for policy development — in general these costs are expected to increase as the complexity of the Commonwealth legislation increases
- an education campaign — these costs are estimated to be the same for all options (although under Option 1, this is likely to be funded by state and territory governments).
- costs associated with external legal advice
- legal drafting costs.

In addition, a new Commonwealth Government regulator would need to be established under Option 3. During the transition period from state government regulators to the new commonwealth regulator, there would be expected to be some duplication of costs.

The costs to the Commonwealth Government are estimated in Table J-7. As per the Consultation RIS, these costs are broadly based on the estimated costs associated with establishing the National Maritime Safety Regulator, with adjustments where necessary to tailor for the specific circumstances.

- Under Option 1, no legislative changes are required, but an Intergovernmental Agreement would need to be developed.

- It is estimated that this would require six additional FTEs at APS6 level on average ($152 231 per year including on-costs)

- Under Option 2, Commonwealth legislation would need to be developed.
  - It is estimated that this would require 8.5 FTEs (8 FTEs for policy development and 0.5 for an education campaign) also at APS6 level on average.
  - External legal costs are estimated at 75 per cent of the costs under Option 3
  - Drafting costs are estimated based on 50 per cent of the costs under Option 3
- Under Option 3, a national regulator would need to be established. This would also require more complex Commonwealth legislation and commensurately more resources.
  - It is estimated that 16 additional FTEs would be required (15 for policy development and one for an education campaign) also at APS6 level on average.
  - The cost of the duplication with state regulators during the transition period is based on an estimated 15 FTEs (also at APS6 level) for 18 months.
  - External legal and drafting costs are based on estimates in the Consultation RIS.

Based on the above assumptions, the costs associated with Option 3 are significantly higher than Options 1 and 2.

Table J-7: Commonwealth government cost of legislative and administrative change

	Option 1	Option 2	Option 3
	$	$	$
Staff costs			
Policy development[a]	913 383	1 217 844	2 283 458
Education[b]	0	76 115	152 231
Duplication with state regulators[c]	0	0	3 321 393
Total	913 383	1 293 959	5 757 081
Other costs			
External legal costs[d]	230 250	230 250	307 000
Drafting costs[d]	215 000	215 000	430 000
Sub-total	445 250	445 250	737 000
Total	**1 358 633**	**1 739 209**	**6 494 081**

[a] Based on an estimated 6 FTEs for Option 1, 8 FTEs for Option 2 and 15 FTEs for Option 3 at an average cost of $152 231 per year (based on the total remuneration of an APS 6 plus 50 per cent on-costs).

[b] Based on 1 FTE at a cost of $152 231 per year.

[c] Based on an estimated 15 FTEs at an average cost of $152 231 per year for 1.5 years (in present value terms using a discount rate of 7 per cent).

[d] External legal and drafting costs for Option 3 are based on estimates from the Consultation RIS. For Options 1 and 2, these costs are estimated at 75 per cent and 50 per cent of the cost of Option 3.

Source: Consultation RIS, The CIE based on estimates provided by the Department of the Environment.

Table J-8: State and Territory government cost of legislative and administrative change

	Option 1	Option 2	Option 3
	$	$	$
Legislative and administrative changes			
New South Wales[95]	79 300	59 475	35 685
Victoria	366 800	275 100	165 060
Queensland	280 000	210 000	126 000
Western Australia	140 900	105 675	63 405
South Australia	156 400	117 300	70 380
Tasmania	195 100	146 325	87 795
Australian Capital Territory	172 300	129 225	77 535
Northern Territory	172 300	129 225	77 535
Total	**1 563 100**	**1 172 325**	**703 395**

Source: PWC, *Management of chemical environmental risks: Consultation Regulation Impact Statement: Updated impact analysis*, Prepared for the National Environment Protection Council Service Corporation, August 2013, pp. 4-6. These estimates have been scaled from the information provided in the updated impact analysis as it is expected that with the development of the National Standard, the expected staff resourcing requirements will be reduced for Options 2 and 3 compared to the options presented in the Consultation RIS.

J.2.3 Costs of ongoing processes

J.2.3.1 Costs of establishing a Working Group (Option 1)

A Working Group would be established under Option 1 composed of representatives from Commonwealth, state and territory governments. It is assumed that the Working Group would meet four times per year. The additional staff time required to consider decisions was based on information provided by jurisdictions of the additional FTE required to review and report on decisions.

In addition, two additional FTEs would be required to perform Secretariat functions for the Working Group (one at EL1 level and one at APS6 level provided by the Commonwealth).

Working Group-related costs are estimated in Table J-9. In total, these costs are estimated at around $692 999 per year.

[95] During the development of the Consultation RIS, the NSW EPA indicated that necessary legislative and administrative costs of implementing the national reform framework would be largely shared with the NSW chemicals legislation review process that has already commenced, and so additional costs in NSW are estimated to be lower than other states and territories.

Table J-9: Annual process costs – Working Group

	Annual salary	Annual salary + oncosts	FTEs	Total cost
	$	$	No.	$
Commonwealth Government				
Secretariat (EL1)	127 092	190 638	1.00	190 638
Secretariat (APS 6)	101 487	152 231	1.00	152 231
Total				342 869
State and territory governments				
NSW	101 474	152 231	0.60	91 338
Victoria	101 474	152 231	0.30	45 699
Queensland	101 474	152 231	0.30	45 699
Western Australia	101 474	152 231	0.30	45 699
South Australia	101 474	152 231	0.50	76 115
Tasmania	101 474	152 231	0.10	15 223
Australian Capital Territory	101 474	152 231	0.10	15 223
Northern Territory	101 474	152 231	0.10	15 223
Total				350 130
Grand total				**692 999**

Source: Australian Public Service Commission, 2014, Australian Public Service Remuneration Report 2013, p. 19; PWC, *Management of chemical environmental risks: Consultation Regulation Impact Statement: Updated impact analysis*, Prepared for the National Environment Protection Council Service Corporation, August 2013, p40.

J.2.3.2 Cost of establishing an Advisory Committee (Options 2 and 3)

For Options 2 and 3, an Advisory Committee would be established. The Advisory Committee is expected to include five to six members drawn from the following areas of expertise, as needed:

- a Chair
- an industrial chemist
- an ecotoxicologist
- an Environmental Risk Manager
- a Policy/socio-economic advisor
- an Ecologist.

It is estimated that the Advisory Committee would meet four times per year, but it could be convened more or less frequently, as needed. Each member would spend six days per meeting considering relevant matters, making a total of 24 days per Committee member per year.

The remuneration of the Advisory Committee would be based on the fees determined by the Remuneration Tribunal. In 2013, the Remuneration Tribunal released a Report on *Remuneration of Public Offices for Part-time Offices*. This covers the remuneration arrangements for various Government advisory boards, committees, panels and authorities. The daily fees for the Chair of these government bodies can range from $512 per day up to $1383 per day and between $384 and $1383 per day for members.[96] It is assumed that the remuneration would be in line with the Gene Technology Technical Advisory Committee (as an example). Specifically:

- the Chair would be paid $1076 per day
- the remaining members would be paid $807 per day.[97]

The costs relating to the Secretariat are assumed to be as for the Working Group.

The costs relating to the activities of the Advisory Committee are summarised in Table J-10. In total these costs estimated at around $434 000 per year. As the Advisory Committee would be a national body, it is expected that these costs would be met by the Commonwealth Government.

If due to changes as a result of the NICNAS review, this cost would decreased to approximately $400 000 per year as the number of chemicals to be considered would be reduced.

Table J-10: Annual process costs – Advisory Committee

	Days	Daily cost	Total cost
	No.	$	$
Committee			
Advisory Committee Chair	24	1 076	25 824
Advisory Committee Members	120[a]	807	96 840
Secretariat			
Staff (EL1)	220	867	190 638
Staff (APS6)	220	549	120 688
Total			**433 990**

[a] Based on 24 days per year for an additional five Committee members.
Source: Remuneration Tribunal, Remuneration of Public Offices: Part-time Offices Report, October 2013, pp. 26-27; CIE.

J.2.3.3 Decision maker related costs

The Decision Maker would make the final decision on all chemicals, regardless of whether they have been considered by the Working Group/Advisory Committee. It is assumed that there would be 12 scheduling dates per year. This would require around 15 days of the Decision Makers time.

[96] Remuneration Tribunal, *Remuneration of Public Offices: Part-time Offices Report*, October 2013, pp. 26-27.

[97] Remuneration Tribunal, *Remuneration of Public Offices: Part-time Offices Report*, October 2013, pp. 26-28.

The Decision Maker will most likely be a delegate within the Commonwealth Department of the Environment (or equivalent) at SES Band 1 level. According to the Australian Public Service Remuneration Report, the total remuneration for an APS employee at SES Band 1 level was $237 530 on average in 2013. This is around $1620 per working day (assuming 50 per cent on-costs and 220 working days per year). Based on this level of remuneration, the cost of the Decision Maker would be around $24 300 per year.

Under Options 2 and 3, the Standard would be administered under Commonwealth legislation, This means there will be additional costs associated with drafting the legislative instruments associated with scheduling new chemicals, as well as registering the instrument on the Federal Registry of Legislative Instruments (FRLI).

Based on an estimated 50 page document, the cost of FRLI registration includes a lodgement fee of $320 plus $32 per page, or a total of $1920 per lodgement. Across the 12 lodgements per year, the total cost is estimated at around $23 040 per year. Drafting costs are estimated at around $15 000 per year. It is assumed that the costs of updating a website for listing of Scheduling Decisions are covered by the Secretariat costs.

By contrast, under Option 1 where adoption of national decisions is voluntary, state and territory regulators would need to make separate decisions on whether to adopt each national decision. This would impose additional costs on state and territory regulators.

- It is assumed that the cost of the additional decision-making process for each state and territory regulator would broadly reflect their contribution to the Working Group (i.e. around 24 days at a cost of around $133 000 under NICNAS Scenario One and around 17.2 days at a cost of around $95 000 under NICNAS Scenario Two).

- There would also be other costs associated with adopting each national decision, including drafting the relevant legislative instruments and registering them on state registries. In the Consultation RIS, it was estimated that state and territory regulators would adopt 60 per cent of the national decisions. It is therefore assumed that under Option 1, each state and territory would incur costs of around 60 per cent of the costs to the Commonwealth under Options 2 and 3, which were estimated at $38 040 (see above). This implies that each state and territory government would incur annual costs of around $18 000.

The total costs relating to the Decision Maker (and associated processes) are shown in Table J-11. Options 2 and 3 are significantly more streamlined than Option 1 because national decisions flow automatically through to state regulation. By contrast, Option 1 would require significantly more administrative effort from state and territory governments to adopt national decisions.

Table J-11: Annual process costs – Decision Maker

	Option 1	Option 2	Option 3
	$	$	$
Commonwealth Government			
Decision maker	24 293	24 293	24 293
Parliamentary counsel	0	15 000	15 000
FRLI	0	23 040	23 040
Total	24 293	62 333	62 333
State and territory governments			
NSW	88 126	0	0
Victoria	55 475	0	0
Queensland	55 475	0	0
Western Australia	55 475	0	0
South Australia	77 243	0	0
Tasmania	33 708	0	0
Australian Capital Territory	33 708	0	0
Northern Territory	33 708	0	0
Sub-total	432 918	0	0
Total costs	**457 211**	**62 333**	**62 333**

Source: CIE estimates.

J.2.3.4 Estimates of ongoing resourcing for compliance related activities

To ensure effective implementation of the proposed options, there may be ongoing costs for compliance and enforcement of risk management outcomes within the jurisdictions in additional to activities already undertaken in jurisdictions. The impact on existing environmental risk managers in terms of increased or decreased compliance costs will depend on the extent to which the proposed options change the way that industrial chemicals are regulated.

This could vary across chemicals and the baseline is of critical importance. For example if the existing regulator would not have regulated the chemicals at all (that is, the 'no regulation' baseline), then all of the compliance costs are attributed to the reforms. However, if the chemical would have been regulated in a different way, the change in cost is relevant. The cost could either increase or decrease. This increase or decrease in costs is also likely to be influenced by the current resourcing that jurisdictions have in place.

An estimate of the potential increase in resourcing is included in Table J-12. This is based on the likely distribution of affected businesses within the jurisdictions.

Under Option 1, as the adoption of decisions under the Standard are non-binding, it is not known to what extent states and territories will implement environmental risk management decisions and the extent of compliance activities is therefore not known. However, it is likely that more resourcing will be required to support industry in implementing the national decisions.

Under Option 2 compliance costs could remain the same, decrease or increase as a result of the National Standard. This will be dependent on how Option 2 is implemented within jurisdictions existing frameworks. It is expected that the resourcing requirements will be less for Option 2 as risk managers will be able to refer industry to a legislated standard, and associated guidance documentation. Under Option 3 it is likely that compliance costs would be less for the states and territories than under Option 1 or 2.

Table J-12: Indicative additional resourcing requirements

	Option 1		Option 2		Option 3	
	FTE	Total Cost	FTE	Total Cost	FTE	Total Cost
NSW	1.5	228 346	1	152 231	0.5	76 115
Victoria	1.5	228 346	1	152 231	0.5	76 115
Queensland	1.5	228 346	1	152 231	0.5	76 115
Western Australia	0.6	91 338	0.5	60 892	0.25	30 446
South Australia	0.75	114 173	0.4	76 115	0.2	38 058
Tasmania	0.3	45 669	0.2	30 446	0.1	15 223
Australian Capital Territory	0.15	22 835	0.1	15 223	0.05	7 612
Northern Territory	0.15	22 835	0.1	15 223	0.05	7 612
Commonwealth	0	0	0	0	2	304 461
Total annual resourcing		981 887		654 591		631757
Net present value[a]		**5 479 568**		**3 653 045**		**3 525 614**

Total cost is based on the total remuneration of an APS 6 plus 50 per cent on-costs

[a] Estimated over a ten year period using a discount rate of 7 per cent, assuming the Standard is implemented from the third year onwards

J.2.4 Total costs for government of upfront and ongoing process for the National Standard

The costs associated with establishing and administering the Standard are summarised in Table J-13. In general, Option 2 is likely to involve the lowest implementation costs because this option is more streamlined than Option 1 and unlike Option 3, does not require the establishment of a new Commonwealth Government regulatory agency.

Table J-13: Estimated costs of developing and administering the National Standard

	Option 1	Option 2	Option 3
	$'000	$'000	$'000
Commonwealth Government			
National Standard development	613	613	613
Legislative and administrative changes	1227	1 739	6 523
Ongoing National Standard processes	2 049	2751	4450
Total - Commonwealth Government	3889	5103	11586
State and territory governments			
National Standard development	203	203	203
Legislative and administrative changes	1 715	1 172	703
Ongoing National Standard processes	9293	3653	3526
Total - state and territory Governments	11211	5029	4432
Total	**15,100**	**10,132**	**16,019**

Note: Estimates presented in net present value terms over the regulatory period, using a discount rate of 7 per cent.

J.2.5 Impact on industry

In addition to the estimated costs of implementing the environmental risk management outcomes as described in Table J-5, it is expected that industry would have one off costs associated with the establishment of a new framework.

It is expected that any changes to the existing framework would result in additional costs to business from reviewing the new arrangements to understand the potential impact on their business, as well as, additional costs of training to ensure that the business complies with new processes.

It is estimated that on average it will take businesses 1 hour to familiarise themselves with the new arrangements. This will be incurred by all business that have some involvement with industrial chemicals. An estimated 50 000 businesses[98] would be expected to incur this cost. The total upfront cost to business is estimated to be around $3.3 million.

It is also estimated that there will be, on average, an additional 1 hour of training for staff. However, this would only be incurred by businesses involved with intermediate and high risk chemicals that would be most affected by the reforms. An estimated 15 000 businesses would incur additional training costs. The total upfront cost to business is estimated to be $0.9 million.

[98] Based on ABS data on the types of businesses operating in Australia.

Table J-14: Estimated upfront cost for business

	Hours per business	Cost per hour	Number of businesses	Total cost
	Hours	$	No	
Upfront cost of understanding new framework	1.0	65.45	50000	3 272 500
Upfront training costs	1.0	65.45	15000	981 750
Total				**4 254 250**

Source: Based on advice from peak body members

There potentially could be some gains from the harmonisation of regulation across Australia. The current approach has the potential to lead to inconsistencies across jurisdictional boundaries in the regulation. This, for example, was found to be the case with the scheduling of poisons and listed drug precursors.

One example is used to illustrate the potential size of the gains from harmonisation. Merck Pty Limited is an international company with a manufacturing and import business in Victoria. Merck Pty Limited distributes its goods Australia-wide. The compliance cost to Merck Pty Limited is estimated to be $12,500 per annum.[99] These costs are in line with PACIA's reporting costs estimates related to the National Pollutant Inventory.[100]

Due to the uncertainty in being able to accurately extrapolate benefits to the broader chemical industry from a single business, the estimated benefits to businesses for reduced reporting and avoided duplication have been estimated based on time saved undertaking reporting activities. It has been estimated that, on average, each business could save 15 hours per year under a consistent national approach to environmental risk management. Assuming an hourly wage rate of $65.45 (including on-costs), this equates to $981 per annum for each business that operates across multiple jurisdictions.

The gains from harmonisation can be expected for businesses operating across multiple jurisdictions. All Australian businesses have the potential to operate throughout each jurisdiction in Australia. There is no specific data on the number of businesses that operate across multiple jurisdictions in Australia. The ABS business count data provides an indication of the size of the business (by number of employees). In practice, it is typically only the larger businesses that do so, although some smaller businesses would also operate across jurisdictions. For the purposes of this analysis it has been estimated that 600 businesses have the potential to operate across jurisdictions.

This could mean that industry could have a saving of $3.1 million over 10 years at a 7% discount rate for Option 2. It is expected this figure would be lower for Option 1 as the non binding nature of the implementation of national decisions could still lead to inconsistency and duplication. This is also likely to be lower for Option 3 as overlap between compliance activities for chemicals at the Commonwealth and state and territory levels (See duplication

[99] Productivity Commission website.

[100] Productivity Commission (2008), *Chemicals and Plastics Regulation*, p.369.

discussion in Section 6.4). This would result in businesses continuing to report multiple agencies which results in less time saved reporting to governments compared to Option 2.

J.3 Summary of estimated net benefits/costs of the proposed reforms

To be able to provide an overview of the expected net benefits and costs of the proposed reforms, Table J-15 has been compiled from the analysis provided in the above sections.

While it is acknowledged that there is uncertainty around these estimates given the limited information available, however, there is a demonstrated net benefit across all of the options.

Based on the top down approach the greatest net benefit is achieved from Option 2 in the order of $111 million (over 10 years in present value terms). Options 1 and 3 had net benefits of $56 million and $108 million respectively.

Table J-15: Implied net benefits/costs to the community

	Option 1 $million	Option 2 $million	Option 3 $million
Impact on the community			
Environmental benefits	41	69	69
Public health benefits	67	112	112
Total impact on the community	109	181	181
Impact on industry			
Cost of understanding new framework	-4	-4	-4
Benefits of harmonisation	1.8	3.1	2.0
Cost of risk management actions	-35	-58	-58
Total impact on business	-37	-59	-60
Impact on government			
National Standard development	-0.8	-0.8	-0.8
Legislative and administrative changes	-3	-3	-7
Ongoing processes for the National Standard	-11	-6	-8
Total impact on government	-15	-10	-14
Total net benefit	**57**	**112**	**105**

Note: Estimates presented in net present value terms over the 10 years, using a discount rate of 7 per cent. Numbers may include rounding errors. Source: CIE estimates.

J.4 Sensitivity Analysis

The sensitivity analyses using discount rates of 3% and 10% are presented in the tables below.

Table J-16: Summary of the sensitivity analysis on the implied net benefits/costs to the community

	Option 1 $million	Option 2 $million	Option 3 $million
Net benefits			
3% discount rate	124	228	221
7% discount rate	57	112	108
10% discount rate	34	73	68

Note: Estimates presented in net present value terms over the 10 years. Source: CIE estimates.

Table J-17: Sensitivity analysis on the implied net benefits/costs to the community – 3% Discount Rate

	Option 1 $million	Option 2 $million	Option 3 $million
Impact on the community			
Environmental benefits	108	180	180
Public health benefits	85	142	142
Total impact on the community	193	322	322
Impact on industry			
Cost of understanding new framework	-4	-4	-4
Benefits of harmonisation	2.3	4	2.6
Cost of risk management actions	-50	-83	-83
Total impact on business	-52	-83	-84.4
Impact on government			
National Standard development	-0.8	-0.8	-0.8
Legislative and administrative changes	-3	-3	-7
Ongoing processes for the National Standard	-14	-8	-10
Total impact on government	-18	-12	-18
Total net benefit	**124**	**228**	**219**

Note: Estimates presented in net present value terms over the 10 years, using a discount rate of 3 per cent. Numbers may include rounding errors. Source: CIE estimates.

Table J-18: Sensitivity analysis on the implied net benefits/costs to the community – 10% Discount Rate

	Option 1	Option 2	Option 3
	$million	$million	$million
Impact on the community			
Environmental benefits	21	34	34
Public health benefits	57	95	95
Total impact on the community	78	129	129
Impact on industry			
Cost of understanding new framework	-4	-4	-4
Benefits of harmonisation	1.6	2.6	1.7
Cost of risk management actions	-27	-45	-45
Total impact on business	-30	-47	-46.1
Impact on government			
National Standard development	-0.8	-0.8	-0.8
Legislative and administrative changes	-3	-3	-7
Ongoing processes for the National Standard	-10	-6	-7
Total impact on government	-14	-10	-15
Total net benefit	**34**	**73**	**67**

Note: Estimates presented in net present value terms over the 10 years, using a discount rate of 10 per cent. Numbers may include rounding errors. Source: CIE estimates.

APPENDIX K CONSULTATION RIS STAKEHOLDERS

Table K-1: Stakeholder Groups who provided written submissions or attended focus groups

Stakeholder	Written Submission	Focus Group
Accord Australasia	✓	✓
Aerosol Association of Australia		✓
Alliance for a Clean Environment		✓
Ausgrid		✓
Australian Industry Group		✓
Brisbane City Council		✓
Cintox Australia		✓
Conservation Council of Western Australia		✓
Earth Foundation Australia Ltd	✓	
EnviroSure		✓
Environmental Defenders Office (SA) Inc	✓	
Environmental Defenders Office WA (Inc)	✓	
Fluoride Information Australia	✓	
Golder Associates Pty Ltd	✓	✓
Haztech Environmental	✓	
Kwinana Industries Council		✓
National Measurement Institute		✓
NSW EPA		✓
Nuplex		✓
Nyrstar	✓	✓
Queensland Department of Natural Resources and Mines		✓
Queensland Department of Environment & Heritage Protection		✓
PACIA	✓	✓
SA Department for Manufacturing, Innovation, Trade, Resources and Energy	✓	✓
SA EPA		✓

Stakeholder	Written Submission	Focus Group
SA Health		✓
SA Water		✓
SafeWork SA		✓
Santos		✓
WA Department of Health		✓
WA EPA		✓
WA Local Government Association		✓
Wesfarmers Chemicals, Energy and Fertilisers		✓
University of Technology, Sydney		✓
Victorian EPA		✓

Table K-2: Summary of comments in the written submissions received on the Consultation RIS

Stakeholder	Summary of Comments
Accord Australasia	• A timely introduction of Option 2 is supported, noting it as the 'most feasible and effective option.' • It was noted that it has been five years since the Productivity Commission made recommendations, and it would be regrettable if this policy need were delayed further. • To avoid further delays, the role of NICNAS should be limited to the 'scientific assessment of the hazards and risks of industrial chemicals', as recommended by the Productivity Commission. • Option 3 may take a long time to realise in the prevailing political and fiscal environment. • Environmental labelling would be best addressed in light of the actual risk management decisions that will be the outputs of Option 2.
Earth Foundation Australia Ltd	• Option 3 was supported, noting that 'Australia needs a logical, streamlined approach that can, by its structure and functionality, bypass entrenched obstacles and give voice and strength to a new executive capacity as represented by the proposed national regulator.' • Further delays in the implementation of regulations have the strong potential to result in additional harm to the environment. • Consultation with industry and an assessment of international approaches to environmental risk management should inform the development of the Decision RIS. • Assessment of chemicals listed on the AICS should be prioritised, with chemicals on this list being assessed with the same level of scrutiny as new chemicals entering the market.
Environmental	• Option 3 is the preferred option, noting that 'a uniform national approach

Stakeholder	Summary of Comments
Defenders Office (SA) Inc	provides greater certainty and consistency which in turn has the potential for greater protection of the environment.' • Option 1 is not supported due to its voluntary nature and unacceptable lack of transparency, accountability and efficacy.
Environmental Defenders Office WA (Inc)	• A combination of Option 2 and Option 3 is preferred. • NICNAS should be supported by a unifying Commonwealth body to undertake certain and specific tasks which NICNAS is not well equipped to deal with at present. This supporting body should not be found to act inconsistently with NICNAS recommendations or findings. • The standard setting should be undertaken by NICNAS, rather than experts in the field who may directly or indirectly be influenced by commercial or political pressures. • The same rules regarding the risks and toxicity of chemicals should apply across the board, regardless of political circumstances. • Risk management associated with NICNAS decisions should be implemented by the Commonwealth under a single national system. This will ensure full consistency, including adoption of nationally consistent compliance and enforcement measures by all jurisdictions. • An advisory body may be useful in providing advice to the Commonwealth body, and should be similar in nature to those within the poisons scheduling scheme, with members of the committee having relevant expertise. • Low risk chemical assessments should not be fast-tracked.
Fluoride Information Australia	• A preferred option is not provided • Water fluoridation in Australia should be banned, and alternative oral healthcare options should be considered. • Industrial pollutants disposed of into our water supplies have the ability to enter the food chain and adversely affect human health. • It is important that the Australian Government manage risks associated with the use and containment of hazardous chemicals
Golder Associates Pty Ltd	• A variation of Option 2 is supported, consistent with the recommendations of the Productivity Commission Report in 2008. That is, a national integrated scientific assessment group with an expert committee, similar to the Chemical Scheduling Advisory Committee model. • The initiative to streamline and provide a coordinated approach to standard setting in Australia is supported. • A national, harmonised system for standard setting will improve the consistency, timeliness and transparency of the process and increase public and market confidence in Australian chemical assessments and control processes. • Achieving these outcomes will have demonstrable benefits to the Australian environment and the health and wellbeing of Australian people. • The RIS should include a broader legislative matrix and specific case studies as well as a broader analysis of benefits.
HazTech Environmental	• A preferred option is not provided • Classification and labelling standards for environmentally hazardous chemicals should be implemented as soon as possible. • In the interim, an agency such as Safe Work Australia should be authorised to

Stakeholder	Summary of Comments
	extend their existing regulations and codes to cover environmentally hazardous chemicals. • Failure to develop a harmonised approach to adequately manage environmental hazards may result in significant costs to industry.
Nyrstar	• A preferred option is not provided • In a general sense, there is an overall lack of strategic direction for the management of chemical environmental risks in Australia. • A nationally co-ordinated approach is required to ensure the consistent implementation of recommended actions that result from NICNAS assessments. • All three issues (uptake of NICNAS environmental recommendations by jurisdictions, communication of chemical environmental risk information, and monitoring the effectiveness of regulation) should be addressed in a complementary manner. • Under a regulated system (such as Option 2 and 3) it is considered that communication and consultation with jurisdictions and stakeholders will be critical to ensuring appropriate decisions are made o Using each jurisdictions' own legislation to implement, comply and enforce (as in Options 1 and 2) may facilitate a higher level of acceptance of the changes through using the local context.
PACIA	• A preferred option is not provided as, at present, the information to be able to support an environmental risk management option is not sufficient • NICNAS has a valid role in providing regulatory access to new chemicals, but an appropriate existing chemicals review program to address current issues is supported. • In order to assist evaluation of proposals there needs to: o be clear in identifying the range of recommendations o Map key environmental management processes o detail appropriate selection of legislative models o Identify broad sets of controls directed towards managing environmental risks • have timely mechanisms that could be progressed to implement the environmental elements of the Globally Harmonised System of Classification and Labelling of Chemicals (GHS).
SA Department for Manufacturing, Innovation, Trade, Resources and Energy	• A preferred option is not provided • The COAG intention to explore options of addressing gaps in environmental protection that have arisen from infrequent and inconsistent implementation of risk management actions is supported. Support was expressed for a framework that: o is administered at state level, o is consultative with relevant stakeholders, o provides flexibility, o provides for sufficient timeframes o minimises unnecessary additional regulatory/compliance costs, o does not result in negative impacts to the environment, and o does not hinder innovation