Department of
Primary Industries and
Regional Development

GOVERNMENT OF
WESTERN AUSTRALIA

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Western Australia.

Safe and effective use and management of 1080 and PAPP

Landholders' manual

Copies of this publication can be obtained from the Department of Primary Industries and Regional Development (DPIRD) website (https://agric.wa.gov.au) or by contacting your local Biosecurity Officer at DPIRD. To find your nearest DPIRD office, contact:

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Preface

Individuals planning to conduct a 1080 and/or PAPP baiting program must have a permit to use 1080 and PAPP bait products in Western Australia. A person must complete training and pass an assessment to become an approved user. This document contains the information required for the training and assessment.

Training and assessment requirements for Licensed Pest Management Technicians (LPMTs) are separate. These are provided by the Department of Health (DoH).

Training for the use of 1080 and PAPP is best undertaken online. If required, a DPIRD biosecurity officer can arrange a written assessment. Please note that permit holders must be over 18 years of age

This document provides information for Western Australian landholders regarding:

- the legislated requirements for the use of 1080 and PAPP in Western Australia (WA)
- personal safety, identifying signs of poisoning and applying appropriate first aid treatment
- how to obtain a permit to use 1080 and/or PAPP on your property
- how to safely store and transport 1080 and PAPP
- the procedures and notification required to carry out a baiting program
- your responsibilities for notifying of any accidents or incidents
- methods for evaluating the success of a baiting program

I remind that the primary purpose for undertaking risk assessments and issuing permits for restricted chemical products (RCP's), including for 1080 and PAPP is to ensure safe use and long-term availability of the toxins and methods used for invasive species control in WA.

Access to online training for approved users can be requested by email from RP.applications@dpird.wa.gov.au or by visiting external progi site and completing the self-enrolment.

For information about requirements to become an approved user, or to apply for a permit for the use of 1080 and/or PAPP products, contact is by email: RP.applications@dpird.wa.gov.au.

Victoria Aitken

Director Invasive Species

February 2021

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Introduction

This manual, in conjunction with the Code of practice for the safe use and management of registered pesticides containing 1080, PAPP and Strychnine for vertebrate pest management in Western Australia (the Code) and associated legislation, provides persons who use, or propose to use, 1080 and/or PAPP. It contains information regarding the user's roles and responsibilities for the safe and effective use and management of the product.

This resource does not provide the information necessary to be recognised or licensed as an authorised officer, approved pastoralist or licensed pest management technician.

This resource outlines information for the landholder regarding:

- The legislated requirements for the use of 1080 and PAPP in Western Australia (WA).
- The properties and mode of action of 1080 and PAPP.
- How to conduct a strategic baiting program.
- Personal safety, identifying signs of poisoning and effecting appropriate first aid treatment.
- How to apply for a permit to use 1080 and/or PAPP on your property.
- How to safely store and transport 1080 and PAPP.
- The procedures and notification required to carry out a baiting program.
- Your responsibilities for notifying DPIRD and the Police of any accidents or incidents.
- Methods for evaluating the success of a baiting program.

Assessment to be recognised as an approved user

Before you may be given approval to use a restricted chemical product, you must demonstrate to the assessing officer that you understand how to use and manage 1080 and PAPP safely.

In order to be recognised as trained in the safe use and handling of 1080 and PAPP, you must complete the online ‘Safe use and management of 1080 and PAPP’ course and complete and pass the course assessment. The course requires self-enrolment and is available on DPIRD’s external progi site. For further information contact your biosecurity officer at DPIRD or email RP.Applications@DPIRD.wa.gov.au.

Alternatively you can contact your biosecurity officer and organise a written assessment. The assessment consists of 20 multiple choice and true/false questions. All the questions are based on the information contained in this resource (excluding the appendices).

There are sample assessment questions included in this booklet (Appendix 1).

Recognition of your training may be revoked at any time if you are found to be non-compliant with the Code, or you fail to demonstrate appropriate knowledge of safe use and handling principles.

Section 1: 1080 and PAPP as pest control products

1.1 1080

Sodium fluroacetate (commonly known as 1080) is a highly poisonous substance. 1080 was introduced to Australian rabbit control programs in the early 1950s. Since then it has been adopted to control many other declared species including foxes, wild dogs and feral pigs.

1080 has a long history of proven safety in Australia and New Zealand. In WA there have been few reports of problems with human safety, environmental persistence and accumulation in the food chain, or adverse impact on populations of non-target species.

In many instances, 1080-based control programs are the only viable strategies available for broad acre control of vertebrate pests. With well-planned and applied baiting programs, rapid high-level population knockdown can be achieved.

Legislation restricts the use of 1080. Misuse of 1080 endangers you, your family, your pets, the public, farm animals and wildlife and may impact on the future availability of this poison as a pest control method.

1.1.1 The natural occurrence of fluoroacetate in plants

Although the 1080 compound used in baits is synthetic, 1080 does occur naturally in some toxic plants of Australia, South Africa and South America. There are about 40 plant species containing 1080 found in Australia. Most of these belong to the genus Gastrolobium and are found in the south-west of Western Australia.

Distribution of plants containing fluoroacetate

Many years after fluoroacetate (1080) was first synthesised, it was found to occur naturally in several genera of plants on three different continents:

- 1944: an African genus (*Dichapetalum*) which had been known to be poisonous to stock.
- 1963: an Australian genus of acacia, Gidyea, (*Acacia georginae*), which occurs on the Georgina River basin on the Northern Territory-Queensland border.
- 1964: several species of Gastrolobium, found mostly in south-western Australia.

Fluoroacetate also occurs in the South American plant Palicourea.

Thirty-nine of the 40 toxic plant species which include those with the highest concentrations of fluoroacetate in their tissues are found in the south-west of Western Australia. No Gastrolobium species occur in the south-east of Australia. Consequently the native fauna there have not evolved an elevated tolerance of 1080 as have those in the south-west of Western Australia.

The distribution of fluoroacetate bearing vegetation in Australia and their fluoroacetate concentration levels is shown in Figure 1.

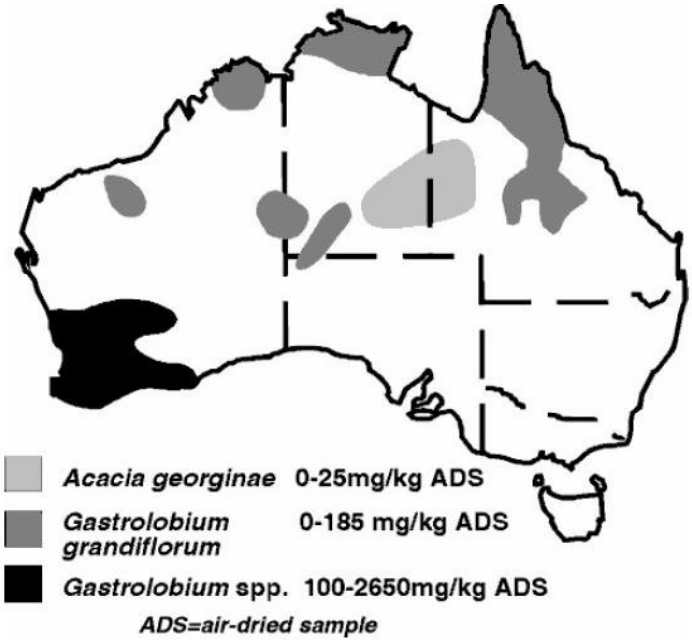

Figure 1 Distribution of fluroacetate-bearing vegetation in Australia and their fluoroacetate concentration levels. Image from Twigg and King (1991).

Concentration in plants

Fluoroacetate is produced by plants as a feeding deterrent. Because of the energy and material required by plants to generate the toxin, it is concentrated in the most essential parts of the plant such as seeds, flowers and young leaves. It also occurs in less concentration in older mature leaves, wood, and roots.

The Gastrolobium species was known to be poisonous to livestock as early as 1839 but the government of the Swan River colony concealed the fact so as not to discourage immigrants to the area.

The widespread distribution of the toxic plants in Australia resulted in many areas not being utilised for primary production. Many parts of the south-west of Western Australia have been retained as nature reserves due to the efforts to exclude stock from them.

1.1.2 Mode of action of 1080

- 1080 is highly soluble in water
- 1080 is generally odourless and tasteless to humans.
- there are small plastic red marker beads in baits for 1080 identification

1080 can be absorbed into the body through:

- the gastrointestinal tract
- open wounds
- mucous membranes of mouth and throat
- the lining of the lungs.

Once absorbed into the body, 1080 acts by interfering with the major biological pathway for releasing energy from food, the tricarboxylic acid (TCA) cycle. As a result, the brain and nervous system function is compromised and death usually results from heart and/or nervous system failure.

There is a lag from the time that 1080 enters the body to the appearance of signs of toxicity. In mammals, this lag-time is generally between half an hour and three hours.

The effects of sub-lethal dose

Animals receiving small sub-lethal doses of 1080 may show mild signs of poisoning, metabolise and excrete the 1080 within one to three days, and then recover.

Most 1080 is eliminated from living animals within three days. If an animal ingests a sub-lethal dose of 1080, toxin residues will not persist in meat, blood, the liver, or fat. This is in contrast to most anticoagulants (for example, brodifacoum, bromadiolone) and many other pesticides.

1.1.3 Biodegradation of 1080

Loss and degradation of 1080 from baits and carcasses is mainly dependent upon leaching, and the action of microorganisms.

Being highly water soluble, 1080 is readily leached from baits into the soil in the presence of rain or even heavy dew. 1080 baits that are exposed to rain will become less toxic ('sub-lethal') as the poison is leached away into the soil. Therefore baiting programs should be suspended during periods of wet weather.

Upon contact with soil a number of fungi and bacteria degrade 1080 into harmless by-products, preventing 1080 from accumulating in or contaminating the environment.

In general, meat baits are usually more impervious to water than grain-based 1080 products. However, all 1080 baits that are exposed to rain can become non-toxic or sub-lethal. Therefore, **baiting programs should be suspended during periods of wet weather.**

1.1.4 Sensitivity of animals to 1080

There is a wide variation in the sensitivity of the different animal groups (families) to 1080 because:

- animal groups convert 1080 to fluorocitrate at different rates
- the effect of the fluorocitrate produced varies between groups.

Canids (dogs and foxes) are among the most sensitive, herbivores and birds are less sensitive, and reptiles and amphibians are relatively insensitive to 1080.

Fish and other aquatic fauna (including many invertebrates) are relatively resistant to 1080, and lethal concentrations would not be achieved even under intensive, standard aerial baiting programs. Also, 1080 is removed from baits fairly rapidly under moist conditions through leaching and microbial action.

The toxicity of 1080 can increase when animals are exposed to temperatures outside of their normal body temperature range.

1080 can have a chronic effect (that is, effects caused by a sub-lethal dose) on a number of species, such as a temporary reduction in their fertility. It does not cause genetic changes to organisms.

Table 1 lists the Ld50 rates for some introduced species in Western Australia.

Sensitivity of native animals

Many native animals in Western Australia are quite tolerant to 1080 because they have co-evolved with 1080-bearing plants. These animals can generally eat some plants or animals containing 1080 with little risk of being poisoned. The same species of animals in south-eastern Australia, where the toxic plants do not occur, are generally much more sensitive to 1080.

Sensitivity of introduced animals

Vertebrate pests such as wild dogs, foxes, rabbits, feral cats, feral pigs and goats are introduced species and consequently, all have higher levels of sensitivity to 1080 than the adapted native species from Western Australia.

This makes 1080 a particularly useful and target specific toxin in this state.

Sensitivity of pets and livestock

Most pets and domestic stock are also introduced species and most are highly sensitive to 1080, so they are susceptible to 1080 baits. Livestock are at risk of death if they feed on the bait trails of 1080 oats used to control rabbits or if they consume recently poisoned carcasses.

Dogs are at risk from both eating baits and through secondary poisoning. Secondary poisoning occurs when animals feed on poisoned carcasses (such as rabbits killed by 1080 baits). Such carcasses may remain toxic until they decompose. This poses little risk to native fauna, due to their enhanced tolerance to 1080.

One advantage of secondary poisoning is that dogs and foxes may be killed by feeding on rabbits poisoned with 1080.

Table 1 LD_{50} rates for introduced species. Data from Twigg and King, 1991.

Introduced animals	LD_{50}
Laughing dove (*Streptopelia senegalensis*)	5.9
Domestic chicken (*Gallus gallus*)	3
House mouse (*Mus domesticus*)	8.3
Black rat (*Rattus rattus*)	0.8
Rabbit (*Oryctolagus cuniculus*)	0.4
Cat (*Felis catus*)	0.4 (LD90)
Fox (*Vulpes vulpes*)	0.13
Dingo (*Canis familiaris dingo*)	0.11
Pig (*Sus scrofa*)	4.1
Goat (*Capra hircus*)	0.5
Sheep (*Ovis aries*)	0.5
Cow (*Bos taurus*)	0.4
Horse (*Equus caballus*)	0.3-0.5
Human (*Homo sapiens*)	approximately 2

The term 'LD_{50}' refers to the estimated dose of poison (milligrams of 1080 required per kilogram of body weight) that will be lethal to 50% of test animals.

1.2 PAPP

PAPP is the short name given to para-aminopropiophenone. PAPP is a chemical toxin that is suitable for control of foxes and wild dogs (but not rabbits). It has been developed as an additional tool and not as a replacement to 1080. Both chemicals have strengths and weaknesses that are useful in different pest management situations.

Para-aminopropiophenone (PAPP) is an aminophenone/phenol derivative (not a naturally occurring chemical).

The development of PAPP arose from studies in the 1970's and 80's that assessed its ability to cause the formation of methaemoglobin in blood. When the toxicity of PAPP was tested in primates, rodents and dogs, the dogs were found to be much more susceptible than other species. The reason for the higher risk is that dogs and foxes metabolise the compound largely by a different pathway that causes abnormally high concentrations of methaemoglobin in the blood.

Methaemoglobin contains oxidised iron Fe+++ (or ferric) but normal haemoglobin is Fe++ (or ferrous). Normal haemoglobin carries oxygen very well, but methaemoglobin does not carry oxygen at all. An animal that experiences high levels of methaemoglobin is unable to deliver oxygen to tissues such as the heart, brain and diaphragm. An affected animal will quickly become unconscious and die. An animal that suffers only a mild amount of methaemoglobin experiences temporary lethargy then recovers to normal within hours.

1.2.1 Mode of action of PAPP

- PAPP's pure form is a yellow crystalline powder.
- PAPP is moderately soluble in water and is readily biodegradable in soil.
- A clinical sign of PAPP poisoning is a blueish colour on tongue and gums
- There is a registered antidote for PAPP
- Small plastic yellow marker beads in baits for PAPP identification

PAPP is absorbed through the gastrointestinal tract, but can also be absorbed via open wounds and mucous membranes (similar to 1080) and is transported to the liver. PAPP toxicity is rapid and relatively free of symptoms and is designed to be taken orally by dogs and foxes. Once absorbed PAPP will induce methaemobglobinaemia, the red blood cells are then unable to carry oxygen to the body and this leads to a rapid deficit of oxygen in vital organs (brain and heart).

If levels of methaemoglobin in blood exceed about 80%, the affected animal dies quietly from oxygen depletion. This is known as metabolic anoxaemia and is painless. Thus, PAPP poisoning is considered a humane pest control technique. Metabolically the effect can be likened to carboxy haemoglobinaemia that is caused by carbon monoxide poisoning.

The process of absorption of PAPP, its metabolic transformation to PHAPP and then action in the red blood cell is fast. Peak methaemoglobin concentrations occur about 30 - 60 minutes after peak PAPP levels. Death generally ranges between 45 to 90 minutes post intake of PAPP.

If small amounts of bait are eaten slowly, this will allow time for detoxification mechanisms to work and haemoglobin levels will not reach lethal levels. An under-dosed or slowly dosed animal may become lethargic or may show symptoms like blue/grey (cyanotic) gums and tongue, but can recover without treatment and with no long-term effects. Any animal that receives a sub-lethal exposure is able to quickly clear the toxin from the system and will have no long-term effects. Within a few hours a partially dosed animal will return to normal.

If a pet or working dog is suspected of PAPP poisoning, the discolouration of the tongue is a critical warning sign and indicates the need for quick intervention. Any compound that converts methaemoglobin back to normal haemoglobin can reverse the effects of PAPP, even if an affected animal is close to death. Response to treatment is immediate. A common antidote to methaemoglobinaemia is methylene blue (Blue Healer), when injected intravenously. Sterile methylene blue solution is commercially available as a human medicine and vets can purchase this product. A ready-to-use product for dog owners is not yet available.

Depending on how much bait has been absorbed, the time to death will typically be 45-90 minutes. This means that it may not be possible to administer the antidote fast enough in remote areas. It is strongly recommend to fitting muzzles or chain restraints on working dogs and pets if they are near a baited area.

1.2.2 Biodegradation of PAPP

PAPP is readily biodegradable in soil. It does not bio-accumulate in the soil structure and is stable under normal environmental conditions, but starts to break down at temperatures around 140ºC.

The breakdown rate for PAPP in baits is slower than for 1080. This is also moisture and temperature dependent. Indicative studies have shown that buried PAPP baits under field conditions retain lethal doses up to several weeks after deployment. This is longer than the typical 1 – 2 week period for which 1080 baits remain lethal in moist soil.

There is no risk of secondary poisoning when using PAPP. The level of PAPP residue in a carcass is very low. Sufficient tissue could not be eaten quickly enough to lead to secondary poisoning of any scavenging animal.

1.2.3 Sensitivity of animals to PAPP

PAPP does not occur naturally in the environment, so there is no resistance among native animals in Australia (unlike 1080). PAPP is toxic to most native wildlife in Australia, including goannas, bandicoots, birds and mammals. For this reason, PAPP is not licensed for aerial baiting programmes. Ground baiting with PAPP should only be considered when non-target species are less active. Risks to non-target animals can be further reduced by burying or covering baits. This reduces access to baits by birds and small native mammals, while not impeding uptake by foxes and wild dogs.

Independent environmental authorities have assessed that even if some individuals are lost during fox control programs, the impact on populations is low. Removing the predators that otherwise prey on these native species or compete for their food, is a greater benefit than the risk, so the balance of acceptable risk is in favour of using baits to control introduced predators.

Studies have identified that the PAPP starts to have an impact on the human body at a dose rate of between 0.8 – 1.8 mg/kg bw. Further information on toxicity of PAPP can be found in the Safety Data Sheet (SDS). A dose rate exceeding about 25 mg/kg live weight will kill most dogs and foxes. Pets and working dogs (domesticated dogs) are impacted at the same level as wild dogs.

1.3.1 Available forms of 1080 and PAPP

For wild dog, fox and dingo control 1080 is available in Western Australia in four forms:

1. A liquid concentrate for injection into raw meat baits (only available to LPMTs and Approved pastoralists) for fox and wild dog control. Also available in liquid concentrate for mixing with grain for rabbit and pig baiting (only available to LPMTs).
2. Manufactured baits for fox, wild dog and pig control.
3. 1080 impregnated oats for rabbits, fox and wild dog control.
4. Capsules for use in Canid Pest Ejectors (CPE) for foxes and wild dogs.

PAPP is available in Western Australia in two forms – manufactured meat baits and capsules for CPEs for fox and wild dog control.

Section 2.0 1080 and PAPP are regulated under legislation

The use of vertebrate pesticides in WA must be in strict accordance with the label directions for use supplied with each product.

2.1 Legislation and regulations

The *Medicines and Poisons Act 2014* is the primary legislation regulating the manufacture, sale and supply, use and possession of 1080 and PAPP in Western Australia (WA). These pesticides are classified as Schedule 7 poisons (labelled Dangerous Poisons) in the Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) and the Schedules of this document are adopted by the *Medicines and Poisons Act 2014*.

The *Medicines and Poisons (Section 72) (Registered Pesticides 1080 and PAPP) Notice 2018* issued under the *Medicines and Poisons Act 2014*, impose conditions and restrictions on the sale, supply, possession and use of 1080 and PAPP products. This Notice limits the handling of 1080 and PAPP products to authorised or approved persons who have been trained or instructed in the safe handling and dealing with the poison. Unless otherwise exempt, a person must have written approval to possess or use 1080 and PAPP products from the DG DoH or the DG of an Authorised Department. For landholders, the permit scheme operated by DPIRD provides the required approval pathway.

The *Medicines and Poisons (Section 72) (Registered Pesticides 1080 and PAPP) Notice 2018* requires a Code of Practice to be issued. The Code is developed collaboratively by the Authorised Departments and approved by the Department of Health, Western Australia.

In addition to the *Medicines and Poisons Act 2014*, these pesticides are regulated through other legislation including:

- The Health (Pesticides) Regulations 2011 contain general restrictions on the use of pesticides and a licensing scheme for those applying pesticides for profit.
- Various regulations made under the Dangerous Goods Safety Act 2004 include provisions relating to the storage (of larger quantities) and transport of these poisons.
- Requirements for containers and labelling of manufactured agricultural chemical products registered with the APVMA are found in the Agricultural and Veterinary Chemicals Code Act 1994 (Clth) (known as the AgVet Code). This Act is adopted in Western Australia through the Agricultural and Veterinary Chemicals (Western Australia) Act 1995.

The Code provides the intent of the legislation and elaborates on the procedures for training and the handling of 1080 and PAPP products. A full copy of the Code is available on the Code of Practice for the safe use and management of 1080 or from your biosecurity officer.

1080 and PAPP are considered a 'dangerous poison' by the Department of Health (Schedule 7) and are defined as Restricted Chemical Products (RCP's).

Section 3.0 Authorisation for the use of 1080 bait products

A landholder, a person or staff operating as a commercial pest controller or undertaking environmental or agricultural pest control can become an authorised person for the supply and use of 1080 and PAPP animal pest bait products in Western Australia. This requires successfully completing training on the safe use and management of 1080 and PAPP.

Landholders, property managers or their agents can complete the assessment online in the form of the 'Safe use and management of 1080 and PAPP' course. Contact DPIRD (RP.Applications@dpird.wa.gov.au) for more information. Recognition of your training may be revoked at any time if you are found to be non-compliant with the Code, or you fail to demonstrate appropriate knowledge of safe use and handling principles.

The preferred option is for the assessment to be undertaken on-line. Alternatively, you may complete a written assessment available from DPIRD. The assessment consists of 20 multiple choice and true/false questions. All the questions are based on the information contained in this document.

A sample of an assessment questionnaire is found in Appendix 1.

3.1 Requirements

To conduct a 1080 and/or PAPP baiting program the owner, landholder or manager of the property must apply for a permit to DPIRD (Appendix 2). Application forms obtain permits for restricted chemical products are available from the DPIRD website Registered pesticide permits | Agriculture and Food.

To obtain a permit, a person must:

3.1.1 Submit a permit application form

The application must include:

- Full name and address details of the applicant
- name and address of the S7 retailer where products will be purchased

- the names and addresses of person/s you nominate as agents to receive bait products on your behalf from the retailer
- the names and addresses of person/s you nominate to lay the baits*.
- proposed start and end date of intended baiting program/s
- target species (more than one may be nominated)
- 1080 and/or PAPP bait product name and quantity required

*All must be appropriately trained or licensed to use 1080 and PAPP pest bait products

Refer to application forms / permit for restricted chemical products from DPIRD website.

For specific information on using 1080 to control rabbits, foxes, wild dogs or feral pigs, or PAPP for controlling foxes and wild dogs, or any additional information regarding 1080 and PAPP, please contact a DPIRD biosecurity officer.

3.1.2 Produce a map of the proposed 1080 baiting program with the application form

A scaled hand drawn map, a computer digitised map or an aerial photograph (with labelled features) should clearly show baiting details in order to obtain a permit to possess and use 1080 and PAPP products (see example Appendix 3).

The map must clearly

- • **Highlight:** all access/entry points
- • **Indicate:** roads & tracks used for baiting
- • **Indicate:** water bodies and water courses
- • **♦: constructed recreational sites**
- • **Shade in:** sites or areas to be baited. It is a good management practice to identify on your map the general area where 1080 and/or PAPP products are likely to be laid.
- • **X: locations of dwellings** (own and adjacent)
- • **▲: proposed location of all poison warning signs.** Must be prominently displayed at all property entrances and other strategic points.
- • **Mark** all areas of native bushland, reserves and national parks
- • **Mark** areas of native fauna habitation
- • **Indication** of property size

Please note: applications without a detailed property map will not be accepted

Note: the map should include a map scale or estimated distances between the baits and local features such as bush areas, dwellings, recreational areas, water bodies etc. A sample of a map for a proposed baiting program is available in Appendix 3.

Section 4 Safety and first Aid

4.1 Personal safety

Both 1080 and PAPP are extremely toxic to humans with dose rates of 2 mg/kg and 0.8 – 1.8 mg/kg of body weight respectively having the potential to kill a human. It is important to remember that there is no antidote for 1080 poisoning and the use of methylene blue to reverse PAPP poisoning may not be suitable for all patients.

Note: A complete commitment to the safe use of 1080 and PAPP is essential.

4.1.1 Personal protective equipment

The protective equipment required may differ according to the 1080 product you are handling.

As a guide, when handling dry formulations of 1080 (such as dried meat baits or oat bait) you should wear:

- chemically impervious gloves (for example, PVC or Nitrile)
- protective clothing (for example, overalls)
- safety glasses or goggles (for oat dust)

When using liquid forms of 1080 such as capsules for Canid Pest Ejectors (CPEs) you should wear:

- elbow-length chemical-resistant gloves (for example, PVC or Nitrile) and after each days use, wash gloves and goggles
- a dust mask for oat dust when using oat based rabbit products.

If product comes into direct contact with eye: hold eyes open, flood with water for at least 15 minutes and seek medical advice.

PVC or Nitrile gloves offer the best protection. Under no circumstances should household rubber gloves, leather gloves or cloth gloves be used as these types of gloves are not impervious to chemicals, and may absorb or accumulate the poison over time. Eye-wear can be used to reduce irritation from oat dust if necessary.

Protective clothing is necessary when dealing with 1080 baits

4.2 Additional precautions

Water should always be available whenever 1080 is being used. It can be used to wash down anyone that comes into contact with 1080 and for cleaning up after bait preparation and laying bait products.

Once you have finished handling or laying 1080 baits or products you should:

- thoroughly wash all equipment and surfaces
- remove protective clothing and wash (separately from other clothes)
- wash hands thoroughly with soap and water.

You must not eat, drink or smoke whilst 1080 is being handled.

4.3 Recognise the symptoms of 1080 poisoning

Recognising the signs of poisoning early can increase the chances of surviving 1080 poisoning. Symptoms include:

- intermittent convulsions
- increased sensitivity to external stimuli (for example, noise)
- irregular heartbeat
- nausea and/or vomiting
- failure to recognise people or familiar objects
- shaking.

4.3 Recognise the symptoms of PAPP poisoning

PAPP toxicoses is rapid and relatively free of symptoms. Animals consuming lethal doses become:

- lethargic
- lose limb coordination
- show a progressive cyanosis of extremities and mucous membranes
- eventually lose consciousness.

Clinical trials with the present bait formulation have shown that mild vomiting can occur prior to losing consciousness in some dogs, but vomiting has not been seen in foxes. In late stages of toxicoses dogs may paddle and vocalise whilst otherwise unresponsive.

4.4 First Aid

All persons who handle or use 1080 and PAPP products must be thoroughly familiar with the safety directions on the label, and additional information found on the SDS.

It is important to note there is no effective antidote for 1080 poisoning and the use of methylene blue to reverse PAPP poisoning may not be suitable for all patients.

A careful rapid response to suspected 1080 and PAPP poisoning is essential to enhance the patient's chances of survival. If poisoning occurs, immediately:

- Call 000 to request an ambulance.
- Call 13 11 26 for poisons information to obtain the current first aid advice.
- Remove any contaminated clothing from the patient.
- Wash any affected skin thoroughly through free flowing clean water.
- Do not induce vomiting or administer anything by mouth (there is a risk of choking).
- Place the patient into the recovery position to maintain their airway.

- If the patient stops breathing, only administer resuscitation if you can ensure that there is no risk to the rescuer of ingesting the poison from the patient (for example, through mouth to mouth contact). A suitable barrier mask should be used if applying resuscitation. Be aware that the patient may have involuntary muscle contractions.
- Reassure the patient and keep them calm.
- Wait for medical staff to arrive or if this is not possible take patient to doctor/hospital as soon as possible.

Make sure the 1080 or PAPP product container, the 'Safe Use and Management of 1080 and PAPP' manual, and the Safety Data Sheet (SDS) are available to medical staff.

Persons undertaking approved training will receive first aid and safety instruction appropriate with the level of risk of exposure.

First aid instructions are provided on the label of the 1080 and PAPP product. Current label instructions in the event of human poisoning are:

For 1080

"Speed in treatment is essential. If poisoning occurs, contact a doctor or Poisons Information Centre. Phone 13 11 26. If skin contact occurs, remove contaminated clothing and wash skin thoroughly. Remove from the contaminated area. Apply artificial respiration if not breathing. If in eyes, hold eyes open, flood with water for at least 15 minutes and see a doctor".

For PAPP

"If poisoning occurs, contact a doctor or Poison Information Centre. Phone 13 11 26. Remove from contaminated area. Apply artificial respiration if not breathing. If poisoning occurs get to a doctor or hospital quickly".

Any changes to these instructions will be reflected on the 1080 and PAPP product label and the Safety Data Sheet (SDS) which is available from licensed retailers and generally also from the manufacturer's website.

Section 5 Using 1080 and PAPP bait products

5.1 Placement of baits

Bait exclusion zones

To help manage the potential risk of poisoning non-target species, including humans, domestic pets, livestock and native animals there are distance restrictions for the placement of 1080 and PAPP baits. Under the Code, the following minimum restrictions are specified:

For ground baiting programs for the purpose of agricultural and related industries protection dried meat baits, fresh meat baits and egg baits (1080 baits) and PAPP baits must be placed no closer than:

- 150 metres from a dwelling,
- 20 metres from permanent or flowing water bodies
- 20 metres from the edge of formed/gazetted public roadways
- 5 metres from boundary fences.

Note: the above distances are consistent with the requirements of the *Dog Act 1976* with respect to the laying of baits for protection of livestock.

For ground baiting programs utilising 1080 only, when baiting is only for nature conservation purposes baits must be placed no closer than:

- 150 metres from a dwelling,
- 20 metres from permanent or flowing water bodies
- 5 metres from the edge of formed/gazetted public roadways
- 5 metres from boundary fences.

For aerial baiting programs, 1080 baits must be dropped no closer than:

- 150 metres from a dwelling
- 20 metres from permanent or flowing water bodies
- 500 metres from all property boundaries and constructed recreation sites, and
- 250 metres from the edge of formed/gazetted public roadways.

Poisoned grain baits (1080 only) must be placed no closer than

- 5 metres from the edge of public roadways, public reserves and public places
- 20 metres from flowing water bodies
- 150 metres from a dwelling.

The Authorising Officer may vary the above distance restrictions for both ground and aerial baiting, provided the varied distance restrictions would not increase the risk to public safety or non-target species.

As part of their risk assessment, Authorising Officers take into account the presence of any gazetted public drinking water supply areas. The Department of Water and Environmental Regulation recommends a bait-free buffer be maintained around the full supply level of a reservoir water body extending for a minimum distance of 100 metres.

The 'Directions for use' supplied with the 1080 and PAPP product will clearly explain the minimum distances that the specific bait type is allowed to be placed away from property boundaries, constructed recreational sites, dwellings, gazetted public roads and permanent or flowing water bodies.

The 'Directions for use' will also stipulate how long the baits should be left undisturbed (if applicable) and how many days of fine weather should be forecast for the baiting period, as rain can reduce the effectiveness of the baits.

DPIRD may impose additional restrictions on your baiting program. These additional conditions will be clearly set out on the permit issued by DPIRD. An example may be "No baits are to be laid within 50m of the boundary fence adjacent to the public golf course".

5.2 Preparing a Permit application

The application form for the use of Restricted Chemical Products (RCP) is available from DPIRD website. A sample of such an application is available in Appendix 2.

5.2.1 Risk assessment of a 1080 program

Once your application form is submitted, DPIRD will assess if it is safe (that is, a manageable risk) to use 1080 and PAPP as proposed on the property.

There are two risk categories associated with the risk assessment:

Manageable Risk: Any area or situation where 1080 and PAPP baits can be used in accordance with the label Directions for Use with minimal risk, or any area or situation where the use of 1080 and PAPP baits poses an acceptable risk provided appropriate additional precautions imposed by the Authorising Officer are taken. Approval to bait (i.e. a Permit) may be granted by the Authorising Officer, subject to conditions which may vary for different areas that have been nominated on the Baiting Application.

Extreme Risk: Any area or situation where the use of 1080 and PAPP baits are likely to pose an unacceptable risk to human health or non-target animals, no matter what precautions are taken or conditions imposed on the application. Approval to bait will be refused.

5.2.2 Issuing permits for the use of 1080 and PAPP products

If your baiting application is approved, DPIRD will issue you a restricted chemical product permit. The permit will identify:

- its unique number
- the period of validity (may be up to five years, dependent on the outcome of the risk assessment)
- the nominated retailer's details
- the approved baiting period/s
- the species to be controlled
- the product and quantity of 1080 and/or PAPP products that can be dispensed during a specified timeframe
- the names and addresses of the nominated receivers
- the names and addresses of the nominated approved users

and any additional baiting conditions and restrictions deemed necessary.

DPIRD may impose additional conditions such as erecting additional signage or not baiting close to areas that are frequented by the public.

DPIRD will provide a copy of the permit to the applicant, the nominated retailer and any recognised biosecurity group or landholder group as indicated on the application form. The retailer is then required to issue products in accordance with the permit.

The issue of 1080 and PAPP products remains restricted and products can only be accessed as specified on the permit.

5.2.3 Amending or renewing permits

DPIRD may amend the restricted chemical product permit if you wish to:

- change nominated retailer
- add or change approved users
- add or change nominated receivers

- amend nominated baiting periods
- amend baiting map
- amend bait product amount or supply interval.

The permit will be cancelled and a new permit issued for changes to the applicant, target species, nominated product or extension to the permit.

Please note that fees apply to permit applications and amendments to permits.

The Code contains provision for a risk assessment and approval to remain valid for up to five years, provided there are no changes to the property that affect the level of risk. Those applications from areas other than the rangelands where surrounding land use changes may occur more regularly may be granted shorter term permits.

If the owner/occupier of the land changes or the land use changes, a new risk assessment and permit will be required.

5.2.4 When permits will not be supplied

Approval for baiting will **NOT** be given to:

- persons under 18 years of age
- people who live in urban areas or on small properties in areas where the use of 1080 and PAPP baits poses an unacceptably high risk
- landholders where there is an unacceptable risk associated with transporting, storing or the handling of 1080 and PAPP baits.

Where baits cannot be issued directly to a landholder, they may be laid under contract (for example, licensed pest management technician) in some circumstances, or alternative control measures may be suggested.

Applicant responsibilities:

It is the responsibility of the applicant to advise DPIRD of any changes to property owners, occupiers, land use, surrounding land use or other permit details.

Nominated users must have received the appropriate training for using or managing 1080 and PAPP correctly and safely to be listed on the permit.

5.3 Requirements for record keeping

All persons dealing with 1080 and PAPP products must keep records of the storage, transfer and use of products unless otherwise exempted by the DG, DoH. Records must:

- include all 1080 and PAPP products,
- include details of receipt from, and consignment to, licensed wholesalers, licensed retailers, licensed pest management technicians and approved users
- include a register of all 1080 and PAPP products stored, and
- be kept for a minimum of two years from the date of supply.

Records to show transfer between authorised people, which must contain the Authorised Department's Permit identification number, must be retained for all transactions of 1080 and PAPP and be signed by the issuer and receiver.

5.4 Purchasing 1080 and PAPP animal bait products

1080 and PAPP bait products may only be supplied by authorised retailers or wholesalers to authorised persons.

When you lodge your permit application, you are required to nominate the S7 retailer who will supply your products. A copy of the permit is issued to the retailer so that you do not need to arrange to have the original permit shown every time a person whom you have nominated to receive (that is, collect) products on your behalf visits the retailer to collect your products.

As per the permit, the nominated receivers must take personal identification to the nominated S7 retailer to purchase specified 1080 and PAPP products.

The retailer may issue up to the prescribed amount of the nominated product within the supply interval identified on the permit.

For example

A permit valid for 12 months allows for 200 dried meat baits to be issued every 13 weeks (three months) – a maximum of 800 baits for the duration of the permit.

A receiver may collect 200 baits at one visit but will not be issued any more until the initial three month period has passed; or

A receiver may collect 100 baits at one visit, and collect a further 100 at another visit within the same three month period.

It is an offence for someone other than a person nominated as a receiver on the permit to purchase or pick up baits from the S7 retailer.

5.5 Transport of 1080 and PAPP bait products

1080 and PAPP bait products must be transported in accordance to the Code:

- 1080 and PAPP products must be transported in a locked container in a secured part of the vehicle.
- 1080 and PAPP must never be transported with foodstuffs.
- Vehicles carrying baits should not be left unattended.
- Domestic animals should be segregated from the baits.
- 1080 and PAPP should be segregated from any passengers and the driver of the vehicle.

Carrying baits in a small locked toolbox inside an anchored and locked tool-chest on a utility would be an ideal transportation method.

5.6 Storage of 1080 and PAPP baits

The storage of 1080 and PAPP products must adhere to the Code specifications. They must be always stored in their **original packaging**, with label in place and intact, in a **double locked container** except when they are required for immediate

use. 1080 and PAPP products must always be kept in areas inaccessible to the public and must not be stored with foodstuffs.

Depending on the 1080 and PAPP product the following types of storage can be used:

- designated, marked poison cupboard
- chained and padlocked in a locked security store
- locked freezer
- locked cupboard.

Each of the above storage methods should be inside a locked shed which is considered sufficient as a double locked container.

All storage areas must comply with the dangerous goods regulations for storage safety, security and warning signs. Safety Data Sheets are also required to be kept with all poisons stored.

5.7 Preparation and laying of baits

Remember, you must ensure appropriate:

- personal protective equipment is worn
- methods of laying bait and the rate of lay to be used
- bait placement and location (consistent with restrictions)
- disposal of carcasses, unused products, used containers.

It is an offence to use 1080 and PAPP products contrary to the product label, directions for use and the Code. You must also comply with any additional instructions given by DPIRD that are contained on the permit.

5.7.1 Hints for reducing potential risks to non-target species

Where suitable, lightly cover dried meat baits with soil or tether baits with a light wire or similar. This may help to prevent birds or other non-target species from finding, consuming or moving baits.

Time baiting to occur outside of native animal breeding seasons or during periods of food shortage.

Do not lay oat baits in bush or close to native vegetation remnants.

Consider using scatter-baiting to make the grain baits less visible and more difficult for native animals to find and consume.

When water birds are present, do not lay grain baits near dams or watercourses, or their feeding areas.

Minimise the potential risk of secondary poisoning of non-target animals by disposing of poisoned carcasses on a regular basis during baiting programs.

5.8 Notification and warning signs

5.8.1 Notify your neighbours of your intention to lay 1080 and PAPP baits

Before 1080 and PAPP baits can be laid, the approved user must notify the occupiers of:

- Any properties adjoining the land to be baited and
- Any other property deemed appropriate by the Authorising officer

at least 3 days but not more than 14 days before bait laying commences.

Notification must provide the following information:

- The intention to lay 1080 and/or PAPP baits
- The period and location of baiting
- The hazards associated with the use of 1080 and/or PAPP baits and
- The risks to human health if poisoned animals are handled or consumed.

If the start of baiting is delayed and the baiting period will extend beyond the cessation date given in the notice, another notice of intent to lay baits is required at least 3 days prior to the original cessation date, advising of the extension. Baiting cannot be undertaken past the expiry period of the permit.

An exemption may be granted from the requirement to notify occupiers of adjacent properties in the case of targeted baiting programs that are well within a parcel of land (e.g. baiting well within a conservation reserve) and more than 2km from neighbour(s), at the discretion of the Authorising Officer.

Notification can be by:

- Letter, e-mail or facsimile
- Telephone, or in person, provided this is accompanied by a signed statutory declaration that the person approved to use 1080 and PAPP has spoken with the owners or occupiers of properties adjoining the land to be baited and
- (In the case of broad scale baiting programs), state and local media (newspapers, radio and television) as approved by the DG, DoH.

Records of all notifications should be kept by the Approved User for at least 5 years in the event that adverse incidents occur and proof of notification is required.

Note: We recommend the use of the template letter included in this manual to notify your neighbours of your intention to use 1080 and/or PAPP (Appendix 4).

5.8.2 Erect prominent warning signs indicating that 1080 and/or PAPP baiting is taking place

Warning signs must be displayed during the baiting period and for at least one month afterwards. Signs must be erected on the property being baited at all entrances and other strategic points, (for example, vicinity of the baits and fence posts).

Warning signs must be erected to alert the public that 1080 baiting is taking place.

Approved users **must** erect prominent warning signs at entrances and strategic points on the property to be baited alerting the public that 1080 and PAPP baiting is taking place.

Warning signs **must** comply with 1080 and PAPP product label specifications and must include specified information listed (see Appendix 5). For example

- date 1080 and or PAPP baits are to be laid
- contact telephone number of permit holder and (if applicable) the approved user
- toxin name ie:1080 and or PAPP
- target animal(s) and a warning that domestic animals and pets can be affected; and
- a “no shooting or trapping” statement.

Approved users **must** maintain warning signs for **four weeks longer than the duration of the operation** or until all untaken baits are recovered.

In the case of ongoing baiting operations that are carried out on a continuing basis, warning signs **must** state that baiting occurs on an ongoing basis.

5.8.3 Restrain pets, exclude livestock and unauthorised persons

Throughout the baiting process you must ensure that unauthorised persons (such as children and tourists) are not able to gain access to the baited areas. It is important to ensure that warning signs advising that 1080 baiting is in progress are placed in prominent places and at property entry points.

Ensure that pets are restrained during the baiting program (consider muzzling working dogs to prevent them eating baits if they are required to work within baited areas) and ensure that livestock do not have access to bait. Exclusion fences can be used to keep livestock away from bait trails, and risks to livestock can be minimised by placing bait stations and Canid Pest Ejectors in areas where livestock are unlikely to access.

5.8.4 Replace baits and dispose of poisoned carcasses

In some cases (for example, for fox baiting) it may be advisable to not lay out all baits at once (i.e.: Recommended rate of lay for fox baiting = 5 baits per 100ha or 5 baits per km^2). Where practical, the baited area should be checked every day and any baits that have been taken should be replaced. This allows you to place the baits in the areas that are most likely to be taken.

Carcasses of 1080 poisoned animals are often difficult to find, but any that are found must be disposed of as specified in this manual (for example, burial or burning).

5.9 Use of Canid Pest Ejectors for 1080 and PAPP

Canid Pest Ejectors (CPEs) are a method of deploying 1080 and PAPP to wild canids (foxes and wild dogs). CPEs consist of a spring powered piston which is mounted in a metal tube which is inserted in the ground. A lure head, comprised of dry meat and a 1080 or PAPP poison capsule, is attached to the top of the tube, protruding from the ground. When triggered, by the lure head being pulled firmly upwards, the piston fires, spraying the toxin from the bait capsule into the canid's mouth.

Advantages of CPEs are that they have greater target specificity than conventional meat baits as deployment of 1080 or PAPP is conditional on upwards pulling which is easily achieved by canids, but less so by non-target species. CPEs are also fixed in place so cannot be moved or cached by animals. The poison capsules used in CPEs are sealed and protected from the elements and can consequently be left in place for extended periods, unlike conventional dried meat baits where 1080 and PAPP degrades over time.

Capsules are available in 3mg and 6mg of 1080 for foxes and wild dogs respectively and 400mg and 1000mg of PAPP for foxes and wild dogs respectively. This is the same rates as current commercial bait products for these species.

Risks to human health associated with CPE capsules are similar to those associated with the use of 1080 dried meat baits.

Currently approved 1080 and PAPP users are able to access and use these devices in accordance with current legislation and the Code. Approved users who intend to use these devices or are wanting to obtain information on this product should familiarise themselves by accessing the manufacturers handbook available from Animal Control Technologies (Australia) Pty Ltd website. and watching PestSmart–Invasive animals CRC's training video on Mechanical Ejectors for wild dog and fox control.

Section 6 Completing the Baiting Program

6.1 Comply with target dates authorised by the permit

Ensure the baiting program is completed by the completion date stated on the permit. Remember, i**t is an offence to bait outside the approved baiting periods.**

6.2 Dispose of carcasses, unused baits and bait containers

6.2.1 Dispose of carcasses

To prevent secondary poisoning of non-target animal species, during the period of baiting and for 14 days after conclusion of baiting, target animals found poisoned or dead on the baited property, or any adjacent property, must be disposed of by:

- Burying to a depth of at least 0.5 metre below natural ground level, or
- Complete incineration of the carcass, except when local fire bans are in place.

The location of sensitive water sources, including both public and private drinking water supplies, must be considered when choosing burial sites for carcasses, due to the risks from both the poisons themselves and carcass decomposition more generally. DWER makes specific recommendations in relation to animal carcass disposal in gazetted public drinking water source areas (PDWSAs).

Water Quality Protection Note 96 recommends carcasses should not be buried in PDWSAs but where removal is not feasible, carcasses should be buried at least 100 metres from the centre line of any watercourse or 100 metres from the high water mark of any reservoir, in individual pits with a maximum separation distance above the average annual maximum ground water level.

In addition, the skin must not be removed from animal carcasses nor the animal carcass used for human consumption, pet food, or any other purpose.

6.2.2 Disposal of unused 1080 and PAPP baits

At the conclusion of the approved baiting period, all unused and unconsumed baits in the possession of the Approved User/Pastoralist must be disposed of by:

- Burial at least 0.5 metres below natural ground level in a dry site at least 10 metres from a water course*, on the same property where baiting was carried out or
- Burial at a gazetted land-fill site with the approval of, and under the supervision of, the local government authority or
- By an alternative means approved by the Authorising Officer, e.g. covering uneaten grain baits with soil

unless the baiting period has been extended by the Authorising Officer (only in extenuating circumstances), or the Approved User has approval or authority to store baits and/or products.

*The location of sensitive water sources, including PDWSAs and private water supplies, must be considered when choosing a site to bury baits. Larger exclusion zones are necessary around PDWSAs and other sensitive water sources. Unless impractical, unused and unconsumed baits must be disposed of outside PDWSAs.

The collection and disposal of baits on pastoral properties, crown land or other broad-scale operations is not required as it is impractical.

6.2.3 Disposal of used containers

Used 1080 and PAPP product containers must be disposed of by:

- Burial at least 0.5 metre below natural ground level in a dry site at least 10 metres from a water course* or
- Collection and disposal by a local government waste management authority (after thorough decontamination and puncturing, flattening or otherwise damaging to render unusable) or
- Disposal at a gazetted land-fill site, with the approval of, and under the supervision of, the local government authority.

* The location of sensitive water sources, including PDWSAs and private water supplies, must be considered when choosing a site for disposal of used containers. Larger exclusion zones are necessary around PDWSAs and other sensitive water sources. Unless impractical, used containers must be disposed of outside PDWSAs.

6.3 Evaluate the success of the baiting program

It is important to ascertain the effectiveness of the baiting program. The evaluation should determine the effect on the target species population, including damage caused by the target species, as well as any effect on non-target species.

Animals killed by 1080 and PAPP are not usually found. This is because of the relatively long lag time between consumption of bait material and the onset of signs of poisoning. Failure to find any carcasses does not mean that the baiting has not been effective.

Methods of evaluation may include:

- evaluation of the number of baits taken
- reduction in damage caused by the target (for example, lambs killed)
- reduction in the numbers of the target animal seen
- reductions in signs of the target animals (for example, digging or footprints)
- increased activity or density of native fauna.

Note: Discuss control options with your biosecurity officer.

1080 can be a very effective control method for rabbits, foxes, wild dogs and feral pigs and PAPP for foxes and wild dogs.

Alternative methods of control are available depending on the target species. Although not always suitable, alternative control methods may include:

- ripping of warrens/dens
- trapping
- shooting
- exclusion fencing
- fumigation.

Often an integrated pest management approach using one or more of these methods is most effective, particularly when you include your neighbours in a broad-scale baiting program.

6.4 Community baiting

Your regional biosecurity group can help you to implement a community program, where neighbouring properties agree to undertake control programs at the same time. This combined effort can often achieve a significant reduction in the target species and a longer-term effect on a landscape scale. Contact DPIRD if there is not a biosecurity group formed for your area.

Section 7 Important points to remember

Report any 1080 and PAPP accidents and incidents immediately!

You must report any accidents or incidents to DPIRD. Where human safety is at risk, the accident/incident must also be reported to the Police.

Accidents or incidents include (but are not limited to):

- spillage of 1080 and PAPP
- human exposure to 1080 and PAPP poisoning (Poisons Information Centre)
- theft or loss of 1080 and PAPP products (DPIRD and Police)
- poisoning of non-target animals (DPIRD)
- use of 1080 contrary to permit conditions set by DPIRD.

Section 8 Conclusion

If used properly, 1080 and PAPP are a safe, efficient, effective and humane way of controlling rabbits, foxes, wild dogs, and feral pigs. However, you need to ensure that you use 1080 and PAPP products in strict accordance with the ‘Safe Use and Management’ manual and the 'Code of Practice for the Safe Use and Management of registered pesticides containing 1080, PAPP and Strychnine for vertebrate pest management in Western Australia ' so that 1080 and PAPP products continue to be available in the future.

Do not take your responsibility lightly. You must take every precaution to ensure that the baits are used safely and do not end up in the wrong place or in the wrong hands.

The continued availability of 1080 and PAPP as a control method for animal pests is vitally important to protect WA's agricultural and pastoral industries, and to maintain our unique biodiversity in WA.

Remember

- There is no effective antidote for 1080.
- Take every precaution to avoid ingesting 1080 and PAPP products.
- Follow all recommended safety procedures for 1080 and PAPP products.
- Assess the potential risk to non-target species prior to baiting.
- Inform your adjacent neighbours in writing prior to baiting.
- Adhere to all baiting restrictions and conditions given by the ‘Safe use and management of 1080 and PAPP’ landholders manual and DPIRD.
- Do not lay baits outside of the designated area.
- Erect appropriate warning signs and leave in place for one month after baiting.

- Do not allow stock to eat 1080 and PAPP products.
- Do not allow domestic dogs to eat dried meat baits or carcasses poisoned with 1080 PAPP.
- Dispose of all un-used baits, poisoned carcasses, if any are found, and product containers.
- Do not sell or transfer 1080 and PAPP products to any person.
- Do not store any 1080 and PAPP product beyond the designated baiting period.
- Learn how to apply first aid in case of 1080 or PAPP poisoning.
- Report any accidents or incidents involving 1080 and PAPP products.

Further reading

Twigg LE and King DR (1991) The impact of fluoroacetate-bearing vegetation on native Australian fauna: A review. Oikos 61, 412-430.

Department of Health, DPIRD, Department of Environment and Conservation , 2012 Code of practice for the safe use and management of 1080 in Western Australia. (https://www.health.wa.gov.au/Articles/S_T/Safe-use-and-management-of-pesticides-containing-1080-strychnine-and-PAPP)

Animal Control Technologies (Australia) Pty Ltd; Canid Pest Ejector- Controlling foxes & wild dogs (animalcontrol.com.au/pdf/ACTA_CPE_DL_Booklet.pdf).

PestSmart Invasive Species CRC; M44 Mechanical Ejectors for wild dog and fox control (video) (youtube.com/watch?v=6Tdq7FKxeO8).

Further information on 1080 is available from the DPIRD website (agric.wa.gov.au).

Appendix 1: Sample assessment questions

1. Once you have finished handling 1080 baits you should:
   a. ☐ Wash all equipment
   b. ☐ Remove contaminated clothing for washing
   c. ☐ Thoroughly wash hands with soap and water
   d. ☐ All of the above

2. Which of the following features is not required to be shown on your map (submitted with your restricted chemical product risk assessment and permit application form)?
   a. ☐ Roads and tracks
   b. ☐ Location of warning signs
   c. ☐ Paddocks currently under crop or pasture
   d. ☐ Dwellings and recreational sites
   e. ☐ Property access points
   f. ☐ Significant bush areas

3. What must be provided to S7 retailers to enable a nominated person to be supplied with 1080 bait products?
   a. ☐ Certificate of title proving their land ownership
   b. ☐ Proof of identity
   c. ☐ Original 1080 permit naming the person picking up the baits
   d. ☐ National Police clearance

4. How must empty 1080 containers be treated?
   a. ☐ Returned to a S7 retailer for recycling.
   b. ☐ Buried or burned and not re-used.
   c. ☐ Labels should be removed before disposing of the containers in the usual methods with other normal household rubbish.
   d. ☐ Containers that have been thoroughly washed may be re-used for other storage purposes.

5. What action should be taken at the completion of a baiting program with bait material that has already been laid?
   a. ☐ No action needs to be taken – the bait will eventually be taken by target species, or it will rain and make the baits non-toxic anyway.
   b. ☐ Oat trails for rabbit baiting must be covered and dried meat baits for foxes and wild dogs collected and buried according to the ‘Directions for use’.
   c. ☐ All the bait should be collected and returned to the S7 retailer.
   d. ☐ If you intend to conduct another baiting program within 12 months, you should collect the un-eaten bait and store it for later use.

Appendix 2: Restricted Chemical Product (RCP)

Department of
Primary Industries and
Regional Development
GOVERNMENT OF WESTERN AUSTRALIA

Restricted chemical product (RCP) permit application

For assistance with completing this form please contact: Pest & Disease Information Service on 9368 3080

Applicant - the applicant must be the owner/occupier of the land to be baited, their authorised agent or an authorised person

Name

Applicant status ☐ Owner ☐ Occupier ☐ Authorised person ☐ Agent (authority attached)

Trading name (if applicable)

Contact / postal address

Phone Mobile

Fax Email

Property name and address

Address invoice to be sent

Nominated S7 retailer/licensed pest management technician to supply products

Name

Address

Phone Mobile

Fax Email

Name

Address

Phone Mobile

Fax Email

Name

Address

Phone Mobile

Fax Email

Nominated persons

Name and address	Phone	Approved user	Receiver	Approved pastoralist	LPMT license number
		☐	☐	☐	
		☐	☐	☐	
		☐	☐	☐	
		☐	☐	☐	
		☐	☐	☐	
		☐	☐	☐	

page 1 of 3

Sample of the application for RCP permit (page 1)

Assessment of native fauna

☐ I have assessed the presence and species of native fauna that may be susceptible to the type of poison proposed for use, and I have deemed there to be low risk.

Property map

Attach a detailed, to scale property map with road names and relevant points below (include distances from bait area)

- **Highlight:** all access/entry points
- **Indicate**: roads & tracks used for baiting
- **Indicate**: water bodies and water courses
- ◆: constructed recreational sites
- **Shade in**: sites or areas to be baited
- **X**: locations of dwellings (own and adjacent)
- ▲: proposed location of all poison warning signs
- Mark all areas of native bushland, reserves and national parks
- Mark areas of native fauna habitation
- Indication of property size

Please note: applications without a detailed property map will not be accepted

Applicant declaration

I, _____

of _____

request a permit to use restricted chemical products from _____ to _____

and being over 18 years of age and the owner/occupier/authorised agent of the above land state that:

- the above information and the attached map is true and correct, and should the use of the recommended products on my property be approved.

I hereby agree to ensure that I and any person nominated as my agent, receiver or approved user for the purposes of this application is appropriately trained and/or authorised and will comply with the relevant code of practice and label directions of use particularly with respect to:

- neighbour notification, warning signs, distance restrictions, clean up after baiting and disposal of wastes, precautionary measures, storage and transport and record keeping; and
- will also comply with any and all additional conditions applied by the authorised risk assessment officer.

As the owner/occupier/approved agent of the above land I acknowledge that should the risk factors on this property change or any of the nominated persons/retailers change, I must inform an authorising officer and submit a revised baiting application form and property map.

Signature (print and sign) _____ date _____

☐ I give my consent for a copy of the issued permit (new and amended versions) to be provided by the Department of Primary Industries and Regional Development to the following recognised biosecurity / landholder group(s):

_____

Important - please note: There is an administration fee per unit of risk assessment. Fees for applications for permits must be paid **prior** to processing. Once the application has been submitted, an invoice will be issued and the application will be processed when payment is confirmed. Processing could take up to 10 days after payment has been received.

The application fee is non-refundable in the event that the assessed risk is deemed as extreme and a permit is not issued.

For more information on permits and charges visit DPIRD's baiting and poison permits webpage agric.wa.gov.au/1080/baiting-and-poison-permits

For assistance with completing this form please contact:
Pest & Disease Information Service on 9368 3080

page 2 of 3

Sample of the application for RCP permit (page 2)

Baiting program

Baiting period: from _____ to _____

Target species	Baiting area (ha)	Type of product	Product quantity	Supply interval (weeks)
Wild Dogs		☐ 1080 canid pest ejector capsules 6mg ☐ 1080 wild dog bait 6mg/bait ☐ 1080 impregnated oat 6mg ☐ 1080 liquid concentrate 30g/L ☐ 120ml ☐ 200ml ☐ 1L ☐ 1.25L ☐ 5L ☐ Dogabait PAPP ☐ 10 bait pail ☐ 50 bait pail ☐ PAPP canid pest ejector capsules 1000mg ☐ strychnine 25g (jar)		
Emus		Restricted to LPMT and authorised persons only ☐ strychnine 25g (jar)		
Feral pigs		☐ 1080 feral pig bait 72mg/bait ☐ 1080 liquid concentrate 30g/L ☐ 120ml ☐ 200ml ☐ 1L ☐ 1.25L ☐ 5L		
Foxes		☐ 1080 canid pest ejector capsules 3mg ☐ 1080 fox bait 3mg/bait ☐ 1080 impregnated oat 3mg ☐ 1080 liquid concentrate 30g/L ☐ 120ml ☐ 200ml ☐ 1L ☐ 1.25L ☐ 5L ☐ Foxecute PAPP ☐ 10 bait pail ☐ 40 bait pail ☐ PAPP canid pest ejector capsules 400mg		
Rabbits		☐ 1080 oat bait (pre-prepared ready to lay) ☐ 1080 pre-mixed pre-feed oat bait ☐ 1080 'one shot' impregnated oats ☐ 1080 liquid concentrate 30g/L ☐ 120ml ☐ 200ml ☐ 1L ☐ 1.25L ☐ 5L		

Pages 1-3 are required. For additional baiting periods please print page 3 only as many times as required. This form can be filled out digitally or on a hard copy but must be printed and signed before sending via email (scan), fax or mail.

Please return completed forms to

Email: rcp.applications@dpird.wa.gov.au
Fax: 9474 2405
Mail: RCP Applications
Department of Primary Industries and Regional Development
Invasive Species Sort Bin 18
3 Baron-Hay Court
Kensington WA 6151

Sample of the application for RCP permit (page 3)

Appendix 3: Mapping areas for a 1080 baiting program.

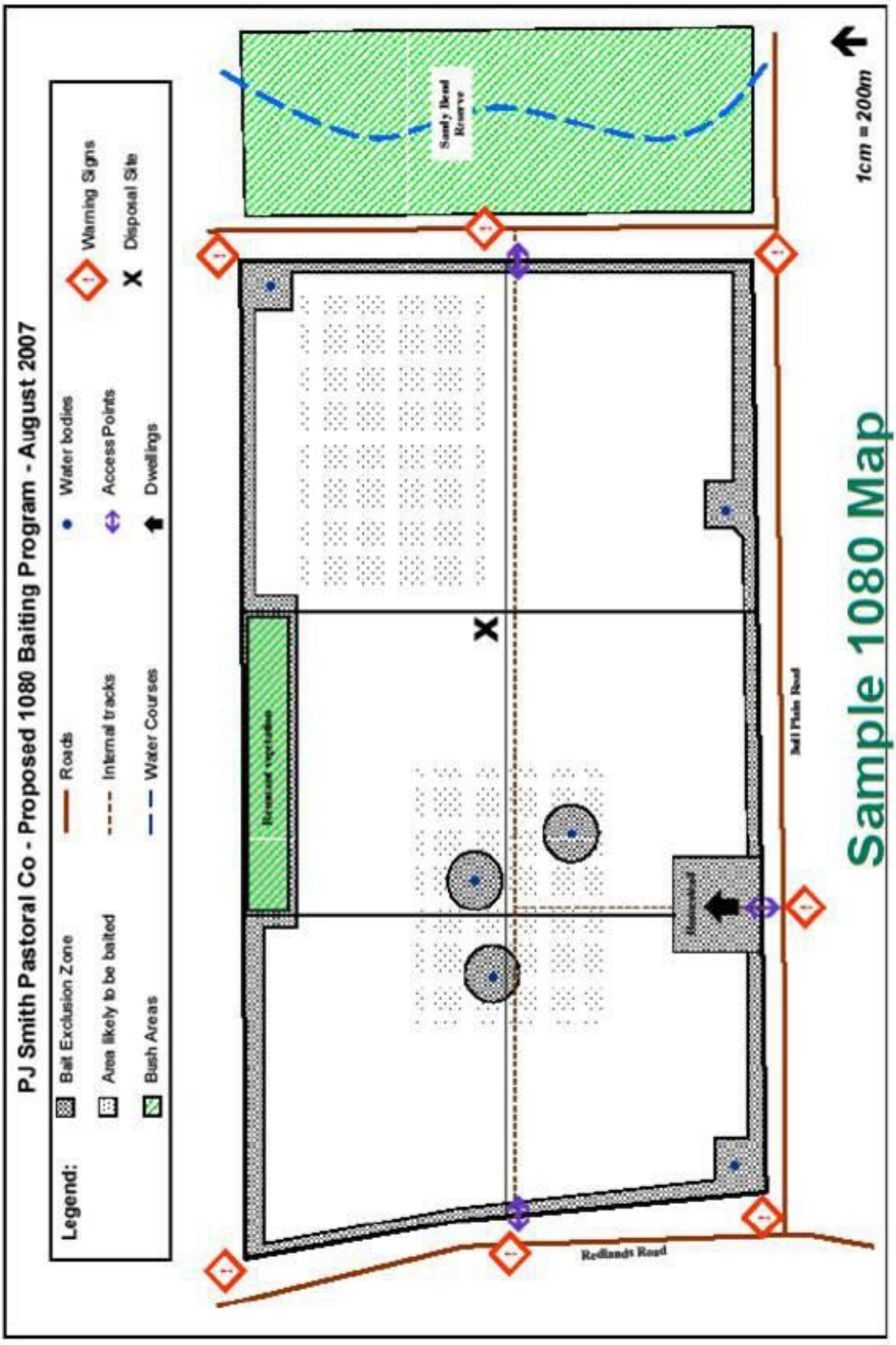

Image 1 - Example of a map to submit with your proposed 1080 baiting program.

Appendix 4: Template letter for notifying neighbours of intention to use 1080.

Copy and paste the text in the next page to prepare your notification letter.

Example:

To: Joe Bloggs Date: 01/07/2016

Notice of Intention to lay 1080 poison at 456 My Block address WA

As a neighbouring landholder I wish to inform you that I (or other authorised people) intend to lay 1080 poison baits on my property for the control of:

☒ foxes. (Tick if relevant) ☐ wild dogs. (Tick if relevant)

☐ rabbits. (Tick if relevant) ☐ feral pigs. (Tick if relevant)

I intend to commence baiting on 20/08/2016 and complete the baiting program on 30/10/2016.

Please be advised that 1080 is highly toxic. The consumption of an animal that has ingested a lethal or sub-lethal dose of 1080 poses a risk of secondary poisoning to humans and other species. Taking of carcasses, removal of hides and shooting or trapping animals (for human or animal consumption) is prohibited during the baiting period and for at least 14 days from the completion of the baiting program.

Please ensure children and other persons in your care are restricted from entering the site of baiting. Please restrain your pets, working dogs and stock to avoid the possibility of poisoning through direct baiting or through eating 1080 poisoned animals.

If you would like further information about this proposed control program please contact me on the number below.

Alternatively, you can speak to the Department of Agriculture and Food, Western Australia (DAFWA) or access more information about the use of 1080 from the DAFWA website (agric.wa.gov.au).

Regards,

Sender's name: Fred Bloggs

Sender's address: 123 My property address

Sender's phone number: 08 123 456 78

To: Click here to enter recipient's name and address.

Date: Click here to enter date.

Notice of Intention to lay 1080, PAPP and/or Strychnine poison at Click here to enter Address where poison is to be laid.

As a neighbouring landholder I wish to inform you that I (or other authorised people) intend to lay the following restricted chemical product(s) (RCP)

☐ 1080 poison baits ☐ PAPP poison baits ☐ Strychnine traps

on my property as part of a program to control

☐ foxes. (Tick if relevant) ☐ wild dogs. (Tick if relevant)

☐ rabbits. (Tick if relevant) ☐ feral pigs. (Tick if relevant)

I intend to commence baiting on Click here to enter date and complete the baiting program on Click here to enter date.

Please be advised that 1080, PAPP and Strychnine are highly toxic. The consumption of an animal that has ingested a lethal or sub-lethal dose of one of these poisons poses a risk of secondary poisoning to humans and other species. Taking of carcasses, removal of hides and shooting or trapping animals (for human or animal consumption) is prohibited during the baiting period and for at least 14 days from the completion of the baiting program.

Please ensure children and other persons in your care are restricted from entering the site of baiting. Please restrain your pets, working dogs and stock to avoid the possibility of poisoning through direct baiting or through eating poisoned animals.

If you would like further information about this proposed control program please contact me on the number below.

Alternatively, you can speak to the Department of Primary Industries and Regional Development (DPIRD) or access more information about the use of RCPs from the DPIRD website (agric.wa.gov.au).

Regards,

Sender's name: Click here to enter sender's name.
Sender's address: Click here to enter address.
Sender's phone number: Click here to enter phone number.

Appendix 5: Warning sign template

This template can be transferred to another word document. Just select, copy and paste.

Appendix 6: 1080 – Characteristics and use

The following information provides details on the characteristics of sodium fluoroacetate (1080) and its use in Western Australia

1080 is an extremely dangerous toxin with no effective antidote. Great care is required with its use

Sodium fluoroacetate (commonly known as '1080') is used extensively as a vertebrate pesticide in Australia and New Zealand. With care, and provided the directions for use are followed, 1080 can be safely used to control vertebrate pests with few potential risks to non-target animals or the environment. In many instances, 1080-baiting programs are the only viable strategies available for broad-acre control of vertebrate pests.

1080 was introduced into Australian rabbit control programs in the early 1950s. Since then, it has been shown to be highly effective against a number of pest species, particularly foxes, rabbits, wild dogs and feral pigs. Well-planned and executed 1080-baiting programs usually achieve rapid, high-level population knockdowns.

Image 2 - Fox predation can cause up to 30% losses of lamb

1080-baiting programs also have a long history of proven safety in Australia and New Zealand. In Western Australia, for example, there have been few reports of concerns with human safety, environmental persistence, accumulation in the food chain, or adverse impacts on non-target species.

Why control vertebrate pests?

Introduced vertebrates such as rabbits, foxes, wild dogs, and feral pigs have a significant and profound impact on agricultural production and biodiversity in Australia, including much of WA. These impacts include soil erosion, crop and pasture losses, the spread of weeds, degradation of on-farm bush remnants, damage to tree plantations, prevention of native plant regeneration and other habitat degradation (for example. destroying nests and nest sites), predation of domestic and native (such as rock wallabies, woylies, bandicoots, numbats, quolls and possums) animals, and the maiming of livestock (such as calves and lambs).

The impacts of these pests also include the potential to spread and maintain endemic and exotic animal diseases, including their implications for human health.

For example, feral pigs can act as reservoirs for a range of animal diseases, such as foot and mouth disease. Wild dogs can act as vectors for diseases that affect domestic dogs (e.g. distemper and mange). Until the disease-free status can be reconfirmed, the presence of any exotic disease in Australian livestock also has adverse implications for Australia's livestock export trade.

Image 3 - Vertebrate pests can be vectors for human diseases

In Australia, production losses and the cost of control to reduce these impacts, can range for $100 to $300 million per annum for rabbits, to around $230 million p.a. for foxes, $110 million p.a. for feral pigs, and $48 million p.a. for wild dogs with a further $10 million p.a. spent on maintaining several dingo/wild dog/vermin-proof fences. Consequently, a number of management strategies have been developed Australia-wide to reduce these impacts, and this includes judicious use of 1080 products.

What is 1080?

1080 concentrate is a highly water-soluble powder which is generally odourless and tasteless to humans. It is stable under normal conditions, but starts to break down at temperatures above 110o C and completely degrades at 200o C. The active ingredient of 1080 is sodium fluoroacetate, which is a natural plant product (see below). However, the 1080 used in baits is synthetically produced.

Mode of action

The ultimate toxicity of the active ingredient of 1080, fluoroacetate, arises from its effects on the energy-producing tricarboxylic acid cycle (TCA) in the mitochondria (mitochondria are the 'powerhouse' of cells). Consequently, affected animals are not able to meet their energy needs. However, fluoroacetate itself is not toxic as it must be converted within the animal (i.e. in the mitochondria) to a second substance, fluorocitrate, to exert its toxic effects. It is

the fluorocitrate thus formed which actually interferes with the TCA cycle and the production of energy.

Because 1080 (fluoroacetate) needs to be absorbed and then converted to fluorocitrate, there is lag between the ingestion of 1080 and the appearance of signs of toxicity. In mammals, this lag-phase is generally between 0.5 and 3 hours, but it can be longer than this (e.g. up to 15 h). Animals receiving small sub-lethal doses of 1080 may show only mild signs, and they metabolise and excrete the 1080 within one (most mammals) to three (reptiles) days. They then recover.

The metabolic and physiological effects of 1080-poisoning are complex. The inhibition of the TCA cycle by fluorocitrate results in a cascade of events, including elevated citrate levels in plasma and tissues. This in turn results in neurological impairment and reduced calcium levels in poisoned animals. Adequate calcium is vital for normal heart function, and for normal communication between nerves in the spinal cord. However, keep in mind, that both the role of these neurotransmitters, and the consequences of 1080-induced neurological impairment, are also very complex and beyond the scope of this Bulletin.

Signs of poisoning

Visual signs of poisoning are generally neurological in carnivores, cardiac/respiratory in herbivores, and a mixture of neurological and cardiac signs in omnivores. However, because of the varied responses which can occur with 1080-intoxication, the classification of individual species into these groupings is often arbitrary.

Natural occurrence of 1080

Fluoroacetate, the active ingredient of 1080, occurs naturally in several toxic plants in Australia, South Africa, and South America. At least 40 such species occur in Australia, with most confined to the south-west of Western Australia. All of these species are legumes but most are from the genus *Gastrolobium*, with one Acacia, and two species of Nemcia. Some of the *Gastrolobiums* can produce considerable amounts of 1080 (e.g. *G. bilobum*, *G. parviflorum*; >2500 mg per kg dry weight of leaves). Fluoroacetate also occurs at very low concentrations in tea leaves, and guar gum, a common constituent of a variety of foodstuffs.

Image 4 - Prickly poison (Gastrolobium spinosum) is native to Western Australia

Biodegradation

1080 is highly water soluble, and therefore readily leaches from most baits. However, mainly due to the activity of a number of fungi and bacteria (at least 24 different species) which can degrade 1080 into harmless by-products, accumulation in, or contamination of, soil or the environment does not occur. 1080 does not attain harmful levels and/or persist in waterways, even when quite high natural concentrations of fluoroacetate are present in the surrounding environment. Furthermore, as most 1080 is eliminated from living animals within three days, 1080 residues do not persist in meat, blood, the liver, or fat. (This is in contrast to the anticoagulant, brodifacoum and several other pesticides). Thus, bioaccumulation of fluoroacetate is very unlikely because biodegradation or elimination of fluoroacetate occurs at many levels in the food chain. This includes microorganisms, invertebrates, birds, mammals and reptiles.

Image 5 - Baits ready to be distributed by plane

The longevity of 1080 in baits, or of the baits themselves, depends upon the prevailing weather conditions. In the presence of rain, baits may only remain toxic for a matter of days, particularly with the grain-based baits. In contrast, some baits used to control pest canids can remain toxic for several months under dry conditions. The loss and degradation of 1080

from baits and carcasses is mainly dependent upon leaching, and the activity of microorganisms. However, it is not only the longevity of baits and their active ingredient (i.e. 1080) which determines a potential risk profile. How quickly baits are taken, the rate of lay, and where baits are located all influence these assessments.

For safety reasons (e.g. restocking paddocks), however, it is best to assume that baits will remain toxic for at least 4 weeks, and end-users must make their own decisions based on the local conditions regarding restocking of baited paddocks. Some bait trails can be covered with soil to reduce any potential hazard.

Sensitivity of animals to 1080

Each major animal group (e.g. reptiles, mammals and birds) have differences in their metabolic rates which means that they also vary in their ability to convert fluoroacetate (1080) to fluorocitrate. Similar differences can also occur between the various Families within these groups. Consequently, there is often wide variation in the sensitivity of the different animal groups to 1080, and this is summarised below.

Canids (dogs and foxes) are among the most sensitive species to fluoroacetate. Herbivores and birds are less sensitive, and reptiles and amphibians are relatively insensitive to 1080.

Fish and other aquatic fauna (including many invertebrates) are relatively resistant to 1080, and lethal concentrations would not be achieved even under intensive, operational baiting programs. There is no evidence of detrimental impacts of 1080-baiting programs on individual invertebrates or their populations at the level of exposure that is likely to result from properly conducted baiting programs.

The acute toxicity of 1080 has been determined for over 240 species/populations of animals, including birds, mammals, reptiles and insects. However, the relative toxicity of 1080 can increase when some warm-blooded animals are exposed to temperature extremes outside of their normal body temperature range. 1080 can also have a chronic effect on animals, such as a temporary reduction in their fertility.

Sensitivity of introduced animals

Vertebrate pests such as wild dogs, foxes, rabbits, feral pigs and feral cats are introduced species and, consequently, are highly sensitive to 1080 (Table 1).

Table 1: LD50* of 1080 (mg/kg) for some introduced vertebrates

Species	LD_{50} (mg/kg)
Dog	0.11
Fox	0.14

Species	LD_{50} (mg/kg)
Rabbit	0.42
Pig	1-2
Cat	0.40
Sheep	0.49
Cow	0.39
Horse	0.41
Chicken	7.70
Human	≈2

Most pets and domestic livestock are similarly quite sensitive to fluoroacetate (1080). Hence, they are also susceptible to 1080 baits. Domestic, and other dogs, are at risk both from eating 1080-baits, and through secondary poisoning. Secondary poisoning occurs when a dog feeds on the carcasses of animals (e.g. rabbits) killed by 1080 baits. These carcasses may remain toxic to introduced species (but not the more tolerant native species – see below) until they decompose within 2-8 days. Secondary poisoning in this way also provides an added advantage in that some foxes will be killed by feeding on carcasses containing 1080. Livestock can also be killed if they are allowed to feed on 1080-poisoned grain baits used to control rabbits and/or feral pigs.

Image 6 - A bait layer being loaded for rabbit control

Sensitivity of native animals

Many native animals in Western Australia have co-evolved with fluoroacetate-bearing plants, and as a consequence, are often quite tolerant to 1080. That is, they can generally eat some of the toxic plants or animals containing 1080 (fluoroacetate) with little risk of being poisoned. However, in contrast, the same genus/species of animals in south-eastern Australia, where the toxic plants do not occur, are generally much more sensitive to 1080

(Table 2). Thus, the enhanced tolerance of our native animals makes 1080 a particularly useful and target specific toxin in WA. However, provided that best practice procedures are followed, enhanced tolerance to 1080 is not a prerequisite for safe and effective baiting programs.

Target specificity

The target specificity of 1080 baits is enhanced by the increased tolerance to 1080 of many of WA's native fauna. However, the specificity of any poison bait, including 1080 products, is determined by a number factors including the sensitivity of target and non-target species to the active ingredient, the body mass of non-target animals relative to that of the target-species, the bait medium used, the hardness of the bait and where the toxin is located, whether non-target animals are exposed to the toxic baits or poisoned animals and, if so, whether these are acceptable food items, and the timing of baiting programs.

Properly conducted baiting programs (i.e. in accordance with the label directions) provide safe and effective control options. Shallow burial of baits under ground litter, or the tethering of baits, can further reduce potential risks to non-target species.

Table 2: LD50 of 1080 (mg/kg) for some native Australian animals

Table heading	Table heading
Bobtail skink	
Western Australia	>800
South Australia	201
Rosenberg's goanna	
Western Australia	235
South Australia	38
Brushtail Possum	
Western Australia	118
South Australia	0.64-0.84
Western grey kangaroo	47
Eastern grey kangaroo	.29
Banded hare-wallaby	106
Chuditch/Western quoll	7.1
Red-tail phascogale	16.5
Emu	96
Mallefowl	106
Bronzewing pigeon	38
Western rosella	71

Table heading	Table heading
Brown Falcon	≈30
Barn owl	≈22

Amounts of 1080 used in New Zealand and Australia

New Zealand is the greatest user of 1080 concentrate, using up to four tonnes of powder per year. In contrast, only around 200 kg of 1080 powder are used in Australian pest control programs each year. 1080 baits have been used in New Zealand since the 1950s, primarily for aerial baiting of possums introduced from eastern Australia, and for the control of rabbits. Possum control is aimed at protecting biodiversity and helps to reduce the spread of bovine Tb. New Zealand sowing rates for aerial operations are 3–5 kg/ha, which equates to 4.5–7.5 g 1080/ha. This compares to around 0.00015 g 1080/ha for many fox baiting programs in Western Australia. Interestingly, areas with fluoroacetate-bearing plants can have up to 550 g of fluoroacetate per ha and yet, due to its degradation by microbes, fluoroacetate does not persist in these environments.

Image 7 - Inspecting and drying field prepared wild dog baits

How does 1080 compare to alternatives?

As yet there are no alternative broad-scale methods for effectively and efficiently reducing the numbers and impact of vertebrate pests across Australia. Some of the possible additional options considered are discussed below.

Immunosterility

Fertility control of pest species is an attractive option as it focuses on decreasing birth rate rather than increasing death rate as do lethal control options. The possibility of developing target-specific, naturally disseminated, anti-fertility, genetically-modified agents has been considered for rabbits, house mice, foxes, and introduced (New Zealand) brushtail possums. However, despite a conservatively estimated $80AUD million research effort spanning three

Cooperative Research Centres over approximately 15 years, the technical challenges have proven too great with current technology, and disseminating or bait delivered fertility control could not be practically developed for any pest species.

Strychnine

Strychnine is not target-specific as most animals are equally highly sensitive to this toxin. Strychnine also has a high environmental persistence. Strychnine is not registered for use in predator baits in Western Australia, but it can be used on trap-jaws to help ensure a humane death when trapping wild dogs. It is also used on grain to control emus because of their high tolerance to 1080 (Table 2).

Shooting, trapping, fumigation and warren destruction

These are all viable techniques when pest control needs to be undertaken at a localised level, although they too can have potential risks associated with their use (e.g. fumigation can kill native animals, warren ripping may destroy native vegetation). Because of the associated cost, and/or the logistics involved, these methods are generally impractical and unsuitable for broad-acre pest control programs.

Trapping can be an useful option for wild dog control

Use of 1080 in other countries

A few other countries also use 1080. These include New Zealand, Mexico, Japan, Korea, Israel, and very restricted use in the United States (sheep-coyote collars). 1080 is not approved in many other countries because of concerns regarding potential human, and other off-target, poisoning.

Safe use of 1080 through regulation

1080 use in Australia is closely regulated by Commonwealth (Australian Pesticides and Veterinary Medicines Authority) and State (Department of Health) government agencies. Supply of 1080 products is strictly regulated, and clear guidelines are provided to govern its use in all States.

In Western Australia, additional State regulations also apply via the Poisons Act 1964, the Poisons Regulations 1965, the Health (Pesticides) Regulations 1956, and the Code of Practice for the Safe Use and Management of 1080 in Western Australia. The Dangerous Goods Safety Act 2004 provides general regulation for the storage, handling and transportation of 1080, and 1080 products.

These restrictions mean that:

1080 is not readily available to the general public.
Authorisation is required before anyone can obtain 1080 baits.
A Risk Assessment is undertaken before any authorisation is given.
Training requirements are stipulated, and must be met.
Reporting of incidents is mandatory.

This process is overseen by the Western Australian Department of Health.

Further reading

Department of Health, Western Australia, Code of Practice for the Safe Use and Management of 1080 in Western Australia.

King D. R. (1990). 1080 and Australian fauna. Agriculture Protection Board Technical Series No 8, 27 pp.

King D. R. and Kinnear J. K. (1991). 1080: the toxic paradox. Landscope 6 (4), 14-19.

McLeod R. (2004). Counting the Cost: Impact of Invasive Animals in Australia 2004. Cooperative Research Centre for Pest Animal Control, Canberra, Australia

Twigg L. E. and King D. R. (1991).