Compound 1080 Special Review Request

EVIDENCE AND SUPPORTING INFORMATION

Please accept the following evidence and information in support of our request for a special review of sodium monofluoroacetate ("Compound 1080"), including the following end products, under section 17 of the *Pest Control Product Act*, SC 2002, c 28 ("PCPA").

Reg. No. 18300 -- Sodium Monofluoroacetate Predacide
Reg. No. 24512 -- Sodium Monofluoroacetate Restricted Toxic Collar Solution
Reg. No. 25857 -- Sodium Monofluoroacetate (Compound 1080) Predacide Tablets
Reg. No. 28865 -- Sodium Monofluoroacetate -- Toxic Collar Solution

I. Summary

Section 17 of the PCPA states as follows:

> **Initiation of Special review by Minister**
>
> **17(1)** The Minister shall initiate a special review of the registration of a pest control product if the Minister has reasonable grounds to believe that the health or environmental risks of a products are, or its value is, unacceptable.
>
> **Special review where OECD ban**
>
> **(2)** Without limiting the generality of subsection (1), when a member country of the Organisation for Economic Co-operation and Development prohibits all uses of an active ingredient for health or environmental reasons, the Minister shall initiate a special review of registered pest control products containing that active ingredient.
>
> **…**
>
> **Request for special review**
>
> **(4)** Any person may request a special review of the registration of a pest control product by making a request to the Minister in the form and manner directed by the Minister.
>
> **Decision**
>
> **(5)** Within a reasonable time after receiving a request, the Minister shall decide whether to initiate a special review and shall respond to the request with written reasons for the decision.
>
> **Scope of special review**
>
> **(6)** For the purposes of this section, the Minister shall initiate a special review only in relation to the aspect of the pest control product that prompted the special review.
>
> **…**

As explained in further detail below, there is overwhelming scientific evidence that the health and environmental risks of Compound 1080 are unacceptable, and that its value with respect to reducing livestock loss is also unacceptable. Although the Minister released Re-evaluation Decision RVD2014-03, Special Review Decision for Compound 1080 on May 27, 2014 ("2014 Special Review Decision"), finding the health and environmental risks of the product to be acceptable, subject to certain changes with respect to labelling requirements, the scientific evidence outlined in this request for a special review demonstrates that fundamental labelling requirements imposed in 2014 are not being met, and that recent scientific evidence demonstrates that the use of Compound 1080 causes unacceptable risks to human health and the environment. There is also increasing scientific evidence and concern regarding the inherent inhumaneness of the product.

Furthermore, the Minister's 2014 Special Review Decision does not directly address the issue of efficacy or "value". This issue is of central importance to the current request. The preamble to the PCPA requires that products may only be registered for use if "…their use would be efficacious and if conditions of registration can be established to prevent adverse health impact or pollution of the environment." The Act's preamble also requires that the regulatory system be designed to encourage the use of alternative approaches to "pest control" and it is not clear if the Minister has considered the benefits of such approaches.

These preambular statements are codified in the Act, which mandates that the Minister support sustainable development; minimize health and environmental risks posed by pest control products and encourage innovative, sustainable pest management strategies that pose lower risks; and "ensure that only those pest control products that are determined to be of acceptable value are approved for use in Canada." (PCPA s4(2)). Efficacy is a key component of a pest control product's "value", which is defined in section 2(1) of the Act, as follows:

> [T[he product's actual or potential contribution to pest management, taking into account its conditions or proposed conditions of registration, and includes the product's
>
> **(a)** efficacy;
>
> **(b)** effect on host organisms in connection with which it is intended to be used; and
>
> **(c)** health, safety and environmental benefits and social and economic impact.

Pursuant to section 17.1 of the PCPA, "the Minister may decide not to initiate a special review in relation to a pest control product if a re-evaluation of, or a special review in relation to, the product has already been initiated that includes the aspect of the product that would otherwise prompt a special review." With respect to Compound 1080, there is additional scientific information that has emerged over the past six years in relation to the use and associated risks of the product that demonstrate that the use of Compound 1080 is unacceptable in light of its lethal impact on non-target organisms, its inhumane nature, the risks it presents to public safety, and it's lack of efficacy at preventing future livestock predations. This includes evidence that fundamental labelling instructions for use are not being followed by those using this lethal poison in Canada. Section 25 of the Act is clear that the Minister may cancel a product's registration if the registrant does not comply with the conditions of registration.

Furthermore, the 2014 Special Review Decision did not address the issue of Compound 1080's unacceptable value, rendering section 17.1 inapplicable because the previous review did not include a key aspect of Compound 1080 that warrants a special review at the present time.

We request that the Minister initiate a special review of the registration of the above-noted pest control products containing Compound 1080, and that following this review she immediately cancel the registration of all products containing Compound 1080 or any of its derivatives. These products should be banned for use in Canada.

The following is a summary of evidence in support of a special review under section 17(1) of the PCPA. This includes information that (a) was not available at the time of the 2014 Special Review Decision, (b) relates to persistent and ongoing noncompliance with labelling requirements since the 2014 Special Review Decision, (c) relates specifically to the value of products containing Compound 1080, a factor that was not addressed in the 2014 Special Review Decision, and (d) relates to concerns surrounding animal welfare and humaneness that have been recognized by Pest Management Regulatory Agency ("PMRA") and Canada's Health Minister since the 2014 Special Review Decision.

Although the strict requirements for triggering a special review where an OECD country has banned an active ingredient pursuant to section 17(2) of the Act do not appear to be met with respect to Compound 1080, we do note that Slovenia is an OECD member country which has banned agricultural use of Compound 1080 due to the threats it presents to both human and environmental health.

Alternatives

- Humane and ecologically sustainable alternatives exist to using Compound 1080 (or other poisons) to lethally remove carnivores where conflicts arise between predators and livestock. In addition, contemporary science indicates that lethal and indiscriminate removal of wolves and other large carnivores can backfire and lead to increased levels of conflict.

Non-compliance

- New data provided through *Freedom of Information and Protection of Privacy Act* RSA 2000, c F-25 ("FOIP Act") requests indicates poor record-keeping related to the use of Compound 1080 and evidence of improper storage and handling.
- New data provided through FOIP requests indicates that recovery, destruction, and disposal of poison baits and carcasses is not being adequately carried out, despite this being listed as an Additional Key Risk-Reduction Measure for the Environment in the 2014 Special Review Decision.
- New data indicates that Compound 1080 is being used within range areas of species at risk.
- New data indicates that Compound 1080 is being used illegally in jurisdictions without a permit, as evident from toxicology results for domestic dogs killed in British Columbia.

Environmental risks

- Regarding non-target deaths, data provided through FOIP requests indicates that poison baits and carcasses are not being recovered in an adequate or timely manner, posing significant risks of primary and secondary poisoning to non-target organisms.

- A study carried out in British Columbia from 1988 - 1992 revealed that 20-28% of wolf baits containing Compound 1080 were taken by non-target species.
- Compound 1080 continues to be placed in areas used by species at risk.
- Swift fox exclusion zones have still not been established for Compound 1080, despite being recommended by PMRA in the 2014 Special Review Decision.
- The toxic action of Compound 1080 is relatively slow in developing, which allows poisoned individuals to disperse widely across the landscape, preventing accurate data to be collected regarding the death counts, and making it difficult to evaluate the real extent of both primary and secondary poisoning.
- The wide geographic dispersion of poisoned individuals across the landscape when Compound 1080 is used leads to under-reporting of secondary poisonings.
- Although Compound 1080 does not readily bioaccumulate in animal tissue (PMRA 2014), evidence shows it can persist in carcasses at hazardous concentrations for several months (Defenders 1982, Meenken & Booth 1997, Eason et al. 2010, Eason et al. 2013).
- Scientists have linked repeated use of Compound 1080 in Australia to increased levels of invasive mesopredators and herbivores, and an ultimate decline in biodiversity (Wallach et al. 2010), accompanied by shifts in forest ecosystem structure (Colman et al. 2014).
- Label changes that resulted from PMRA's 2014 Special Review Decision on Compound 1080 have failed to achieve their intended objective and are inadequate to address the concerns raised in the 2014 Request for Special Review as well as this request.
- Despite serious risks presented by Livestock Protection Collars containing Compound 1080 in liquid form (60 mL collar device, 10 mg/mL of Compound 1080), the 2014 Special Review Decision neglected to consider these devices, which should be part of a full special review in light of the requirements of the PCPA to consider products' risk to health and environmental impacts, as well as their value and efficacy.

Humaneness & animal welfare

- On July 6, 2014 the Canadian Veterinary Medical Association ("CVMA") denounced the use of Compound 1080 in a position statement on pest control due to the severe pain and convulsions it causes (CVMA 2014), bringing the CVMA's position in line with other expert bodies including the American Veterinary Medical Association and Canadian Council on Animal Care, which have deemed Compound 1080 to be inhumane and unacceptable.
- By hosting a public consultation on "Humane Vertebrate Pest Control" in 2019, the PMRA formally recognized that animal welfare is an important societal concern and responsibility.

II. Background

Compound 1080 is an extremely lethal chemical belonging to the "Fluoroacetic Acid" chemical family (EPA 1995). Despite its highly controversial use as a predator control substance and the numerous and varied risks it presents to the environment and the health and safety of Canadians, Sodium Monofluoroacetate, commonly called Sodium fluoroacetate or Compound 1080, is still used in Canadian farming to kill predators who may prey on livestock.

The poison is highly toxic and has a broad killing spectrum. It is labeled as a "super poison" by the US Environmental Protection Agency ("EPA") (EPA 1995). According to the World Health Organization (2009), Compound 1080 is a Category 1a "Extremely Hazardous" poison (the most toxic category).

Classified as a restricted-class product in Canada (PMRA 2015) and regulated under the PCPA, Compound 1080 is currently authorized for use as a predacide in Alberta and Saskatchewan to kill wolves and coyotes suspected of livestock predation. The poison is available in two forms: i) tablets (5 mg/tablet of Compound 1080) which are placed in meat baits set out to attract the predator(s) and, ii) 60 mL liquid bladders that fill collars worn by livestock (PMRA 2014). These devices, known as Livestock Protection Collars or LPCs, are worn around the neck of sheep or goats and contain liquid packets of Compound 1080 intended to kill canids should a neck bite occur. These collars can also rupture unintentionally or fall off and become lost.

The federal government registers products containing Compound 1080 for use in Canada and issues five-year permits to Alberta and Saskatchewan, granting those provinces authority to administer and monitor the use of Compound 1080. The responsibility to handle and record use of the product may then be further delegated to municipal governments, which distribute tablets of Compound 1080 to landowners. Our research suggests that the use and handling of this dangerous product is not adequately monitored and cannot be regulated well enough in Canada to ensure public safety, nor to prevent significant environmental harm in the form of the killing of non-targeted wildlife.

Compound 1080 causes extreme levels of pain and suffering to wolves, coyotes and unintended victims, and poses a serious safety risk to Canadians. Symptoms of Compound 1080 poisoning include vomiting, anxiety, frenzied behaviour (i.e. running and screaming fits), tetanic seizures, and death from cardiac failure or respiratory arrest due to lack of oxygen to the brain. Poisoned animals suffer for hours before dying.

Given the extreme toxicity of Compound 1080 and the information presented herein, there is a clear and urgent need to discontinue the use of Compound 1080 as a pest control product in Canada and ban it from all further use. Canada is long overdue to ban this product. The government should support farmers as they adopt humane and sustainable practices that are more effective at preventing and reducing livestock depredations.

A. Environment

i. Non-selectivity of Compound 1080

Compound 1080 was first used in the 1940's as a rodenticide (Fagerstone et al. 1994, Randal 1982, Cluff and Murray 1992). It is recognized as a systemic insecticide (EPA 1985) and has been used widely around the world as an agricultural control principally for rodents, rabbits, and some carnivores (BCME 1991). Because canids are up to ten times more susceptible to the poison compared to most other mammals, it was previously believed that Compound 1080 could be used selectively on canids. However, veterinarians with the Canadian Cooperative of Wildlife Health (1999) have classified Compound 1080 as "moderately selective for canids". Among all poisons used to kill wildlife, Starlicide,

a chemical avicide (poison targeting birds), is the only poison known that is toxic to just one taxon, in this case, avian species (Cain et al. 1972). No other poisons are selective to a taxon.

Although variation in toxicity of poisons to various animals exists, this alone does not guarantee selectivity (Cain et al. 1972). To further illustrate the indiscriminate nature of this broad-spectrum poison, note that it has been used as a predator killing agent for ferrets, stoats (Mustelid family), and feral cats (Felid family) among other animals, proving that Compound 1080 is not selectively poisonous to animals in the Canid family (CCWHC 1999).

Wallach et al. (2010) demonstrated ecosystem level disturbance; intensive lethal control of dingos in a program carried out in Australia using Compound 1080 is contributing to increased levels of invasive mesopredators and herbivores, and ultimately a decline in biodiversity. Similar findings were reported by Colman et al. (2014) who noted unintended shifts in forest ecosystem structure when comparing areas that use Compound 1080 to target dingos with areas in which this poison is not used. This information and ecosystem level disruption (i.e., One Health) has not previously been considered by the PMRA.

ii. **Non-target wildlife species and species at risk**

Sodium monofluoroacetate is toxic to most mammals and poses a serious and unacceptable risk to non-target organisms, including wild and domestic species (Burns and Connolly 1995, CCWHC 1999 and PMRA 2014). Prior to the 1972 ban on predator toxicant use on federal lands in the US, federal predator control supervisor Dick Randall provided an account of his government work with Compound 1080, which illustrates its impacts on non-target animals (Randall 1981 and Defenders 1982). Randall collected extensive data on dead wildlife in proximity to Compound 1080 bait stations between 1969 and 1972. Using tracer material (Zinc and Cadmium sulfide combined with Compound 1080 poison) to identify Compound 1080 victims, Randall reported the following recovered species containing tracer material: coyote, dog, black bear, badger, bobcat, pine marten, mink, weasel, golden eagle, red-tailed hawk, magpie, prairie falcon, sharp-shinned hawk, Canada (gray) jay, and rough-legged hawk (Randall 1981, Defenders 1982).

Compound 1080 is currently used in Canada to target coyotes and wolves in Alberta and Saskatchewan, however its use presents great risks to numerous species sharing a landscape as it does not discriminate amongst the species it kills. Endangered species are at risk directly from Compound 1080 baits or indirectly from contaminated carrion.

Compound 1080 is believed to be at least partly responsible for the decline of several species at risk in North America, including the burrowing owl (Butts 1973), swift fox (Ginsberg & MacDonald 1990), California condor (Hegdal et al 1986) and black-footed ferret (Defenders of Wildlife 1982).

Because of its non-selectivity, Compound 1080 has killed humans, pets, eagles, badgers, bobcats, raccoons, bears, wolves, coyotes and various other wildlife species in North America. Animals that ingest non-lethal doses of the poison have reduced survival after being weakened, as individuals depend upon alertness, agility, and coordination to survive. If they recover, these animals may experience long-term effects of toxicity.

iii. Primary and secondary poisoning

Poison baits are often the subject of vigorous debate over the impact they have on non-target animals, including endangered species, domestic animals, companion animals, and humans. There is agreement in the scientific literature reviewed that Compound 1080 poison used in livestock protection collars or in baits causes primary and secondary risks of poisoning to non-target animals (PMRA 2014, Sherley 2007, Hjertass et al. 1995, Defenders 1982, EPA 1985). Since the exact lethal dose is unestablished for some species, the deployment of Compound 1080 baits can pose a primary hazard to small felids, mustelids, foxes, and domestic dogs, and cats (CCWHC 1999).

To illustrate the high frequency of occurrence of consumption of poisonous baits by non-target animals (primary poisoning), consider a study carried out in British Columbia from 1988 - 1992 which revealed that 20-28% of wolf baits containing Compound 1080 were taken by non-target species (BCMOELP 1999). In other words, 328 baits were taken by non-target species out of 1,128 baits placed for wolves (BCMOELP 1999). Between 1996 and 1998, 20% of 484 Compound 1080 baits laid for wolves, were taken by non-target animals (BCMOELP 1999). British Columbia has not renewed its use permit for Compound 1080 based on these findings, and persistent, valid concerns over the impact of Compound 1080 on non-target animals including rare and endangered species, as well as domestic and companion animals (PMRA 2014, Sherley 2007, EPA 1995).

Residual poison in the carcasses of Compound 1080 victims can poison other animals feeding on the contaminated carrion, a process termed “secondary poisoning”. Secondary poisoning can occur when an animal consumes unmetabolized Compound 1080 from the gut of a victim. In addition, when Compound 1080 is absorbed into the bloodstream, it gets distributed through skeletal muscle, soft tissues and organs (CCWHC 1999, Eason et a. 2010). The elimination half-life of Compound 1080 can cause long-term toxicity in tissues of poisoned animals that do not die and sets up a risk of secondary poisoning (Aulerich et al. 1987, Gonchorav et al. 2006).

Although Compound 1080 does not readily bioaccumulate in animal tissue (Eason et al. 1994, PMRA 2014), it can persist in carcasses at hazardous concentrations that remain lethal to various scavengers, both mammalian and avian, for several months (Defenders 1982, Meenken & Booth 1997, Eason et al. 2010). Research in New Zealand demonstrated that after 75 days, carcasses of possums poisoned with Compound 1080 still posed a serious risk to dogs (Eason et al. 2013). Scavenging birds will consume poison remaining in the digestive system of their carrion, and fly away prior to succumbing to death, further spreading this poison, and making the true biological cost of the toxicity difficult to determine.

The clinical pattern of intoxication (i.e. symptoms appear) characteristically involves a latent period from 0.5 to 6 h (Chenoweth 1949; Goncharov et al. 2006). Because animals who consume baits most often die at locations distant from the bait site, verification of results of poison is highly problematic, although such verification should be an integral requirement of any program that uses poison (CCWHC 1999). Thus, the relatively slow toxic action of Compound 1080, which can take several hours, allows poisoned individuals to disperse widely across the landscape, preventing accurate counts and making it difficult to evaluate the real extent of both primary and secondary poisoning (Cain et al. 1972, Ryden 1981, Smits, J. Pers. comm. 17 Oct. 2017, P. Paquet pers. obs.). Indeed, the Alberta Environment and Sustainable Resource Developments Use of Toxicants for Wildlife Management (updated July 6, 2012) states the following about Compound 1080:

> …it is very difficult to monitor its effectiveness as it is slow acting; animals can travel long distances before succumbing to the toxicity. Retrieval of carcasses is typically impossible and secondary poisoning of other wildlife species feeding on the carcass is a potential concern. (p. 58 AEP E17-G-0418)

Veterinarians have concluded that canids will generally vomit shortly after oral exposure to Compound 1080, subsequently distributing the poison through a vast area before dying (Randal 1981, Defenders 1982). Although some have suggested that the vomitus of a poisoned animal may be dilute by the time poisoning has induced vomitation, we are not aware of any studies that have undertaken to test this theory, possibly because it would be difficult to carry out, and suggest that the precautionary principal be imposed to include this as a risk factor.

The secondary and possible tertiary poisoning of animals by Compound 1080 puts non-target animals that scavenge at risk (Cain et al. 1972). It is essentially impossible to estimate the diversity and number of non-target animals affected by secondary poisoning from a single poisoned carcass that remains on the landscape. To illustrate the extent of potential secondary poisoning, consider that between 2011-2016 there were thirteen records from Alberta's Ministry of environment and Parks showing that Compound 1080 baits were consumed but no carcasses were recovered (AEP 2018 [E17-G-0418]; see section on non-compliance with label requirements).

To further illustrate the non-selectivity of this poison, consider that in Australia and New Zealand secondary poisoning by Compound 1080 has been deliberately and effectively used as a widespread killing agent for all animals considered "exotic" species (i.e. not native to the island) (Proudfoot et al. 2006), excluding animals raised for human consumption. Also, there is ample published scientific evidence of harm caused by Compound 1080 to many species native to these areas, as outlined in Pollard's (2017) response to the Department of Conservation's reply to "Aerial 1080 poisoning in New Zealand: reasons for concern".

Dr. Judit Smits [DVM, MVetSc, PhD.], a Professor of Ecotoxicology and Wildlife Health, Department of Ecosystem & Public Health within the Faculty of Veterinary Medicine at the University of Calgary, summarizes these risks in the following comment she provided: (Pers comm. 16 Oct 2017)

> Persistence of 1080 in the environment in baits, and in the carcasses of poisoned carnivores, causes secondary poisoning in unintended animals. Even for those animals not directly consuming the bait, other predators and scavengers can be intoxicated by feeding on the poisoned carcass. Non-target animals that may have consumed some of the bait will not behave normally, making themselves more susceptible to predation, and thus provide yet another route for poisoning non-target animals.

The two provinces with active permits for Compound 1080 (Alberta and Saskatchewan) allow the placement of Compound 1080 within the home ranges of several federally listed species at risk that scavenge (See figures 1 – 4). Other sensitive scavenging mammals and birds are listed provincially with at risk status. Primary and secondary poisoning by Compound 1080 place undue threats on these animals.

Mammals

Compound 1080 is highly toxic to all warm-blooded animals when ingested (EPA 1995). The black-footed ferret (*Mustela nigripes),* one of North America's rarest mammals, is believed to have been adversely affected by Compound 1080, suffering a great decline in population during the years of broadest Compound 1080 application in the US (Defenders 1982). Listed as Extirpated under the *Species at Risk Act*, SC 2002 c 29 ("SARA"), black-footed ferret populations declined in large part due to poisoning programs for Richardson's ground-squirrels and black-tailed prairie dogs, which resulted in reduced prey availability and secondary poisoning through consumption of poisoned prey (Tuckwell and Everest 2009). There are reintroduction programs underway for the ferret in Southern Saskatchewan, as well as in eight US states and Mexico (Santymire et al. 2014).

Among non-target species susceptible to Compound 1080 poisoning, foxes are thought to be the most at risk because they are small canids known to scavenge and are likely to be attracted to Compound 1080 baits placed for wolves or coyotes (CCWHC 1999). The use of Compound 1080 intended for killing coyotes is believed to be responsible for the decline of swift fox (*Vulpes velox*) populations in California, although fortunately swift foxes have re-colonized many of their populations since the substance has been banned on US federal lands (Ginsberg and MacDonald 1990). The swift fox is considered a threatened species in Canada (COSEWIC 2009) and has been given the provincial status of endangered in Alberta and Saskatchewan. Swift foxes have been re-introduced in southern Alberta and Saskatchewan and must be protected from any potential poisoning if their conservation programs are to succeed.

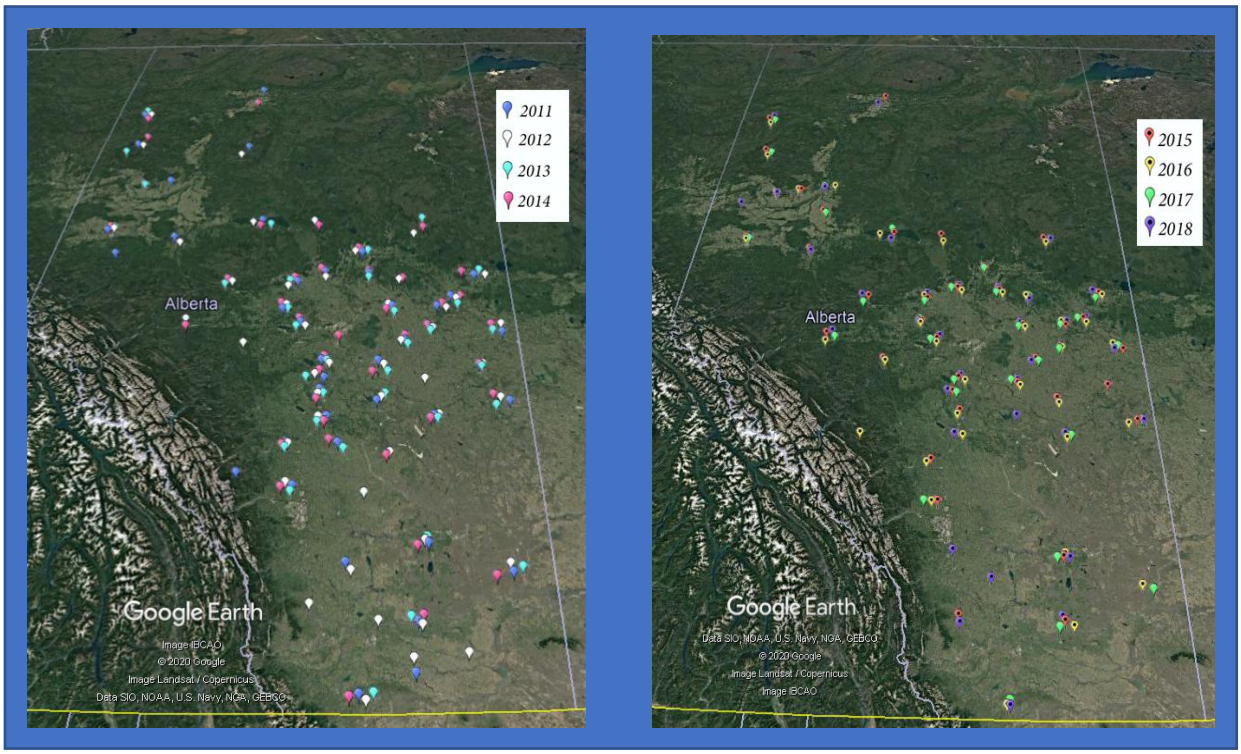

FIGURE 1 APPROXIMATE USE-LOCATIONS OF COMPOUND 1080 IN ALBERTA 2011 THROUGH 2014 AND 2015 THROUGH 2018 AFTER RE-EVALUATION DECISION. MARKER'S INDICATE COUNTY USE OF COMPOUND 1080 BY YEAR. DATA OBTAINED FROM AB FOIP'S AF 2017-G-0010 AND AF 2019-G-0032. SOURCE: WOLF AWARENESS INC.

In an effort to reduce incidental deaths of the federally endangered gray wolf and/or brown (grizzly) bear in 1993, the U.S. Fish and Wildlife Service identified restricted areas where Livestock Protection Collars containing Compound 1080 were not to be used (EPA 1995). Canada continues to use predacides where threatened species range. Although Saskatchewan determined zones of restricted use for Compound 1080 that coincide with federally threatened swift fox habitat, these zones allow the use of Livestock Protection Collars. Swift foxes remain vulnerable to secondary poisoning from unrecovered carcasses in areas that allow Compound 1080 in any form. In 2005, the PMRA indicated concern around "the use of [Compound] 1080 collars in areas in and nearby swift fox habitat" (PMRA 2005, pg. 9). This concern has not been resolved. No exclusion zones exist for Compound 1080 within species at risk ranges other than the zone identified for swift foxes (and black-footed ferrets) in southwestern Saskatchewan, which still allows Compound 1080 in Livestock Protection Collars. Our review of Saskatchewan Environment Compound 1080 Utilization Record Forms indicates that two Livestock Protection Collars were used within the designated swift fox restriction zone in Shaunavon, Saskatchewan in July of 2016 (Saskatchewan FOIP ENV 209/17G), putting this federally threatened species at great risk, see Figure 5.

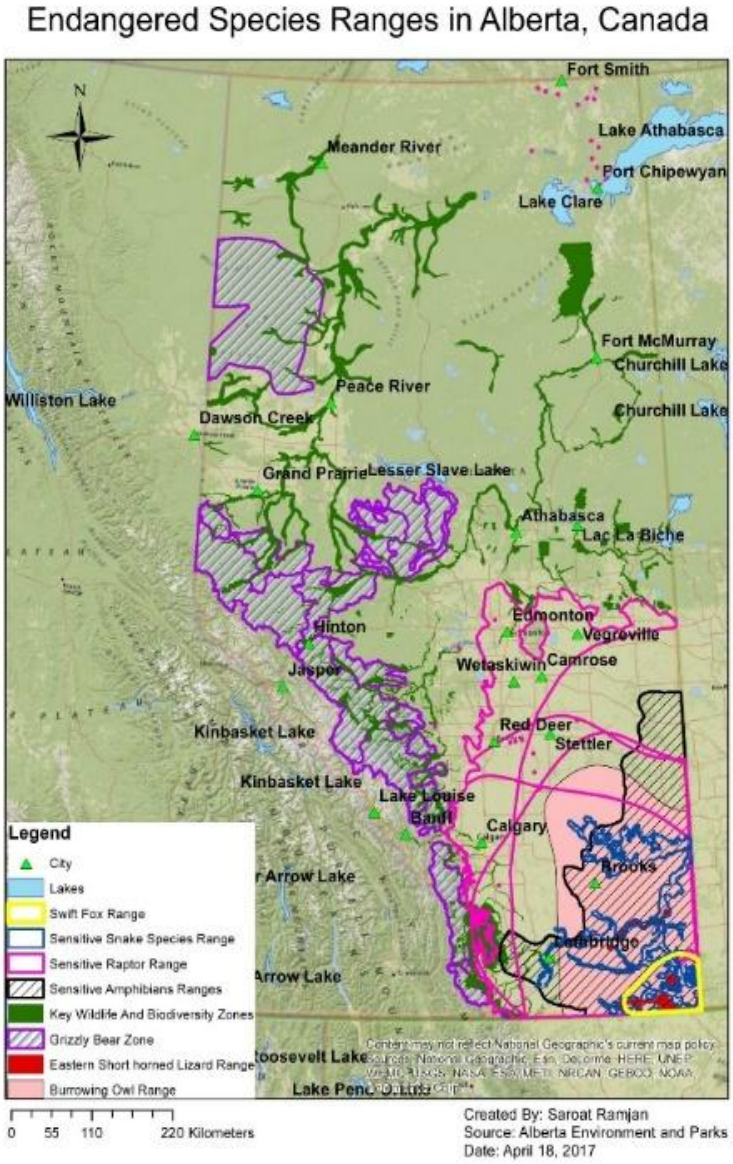

FIGURE 2 SELECTED SPECIES AT RISK RANGES IN ALBERTA (NOT COMPREHENSIVE).

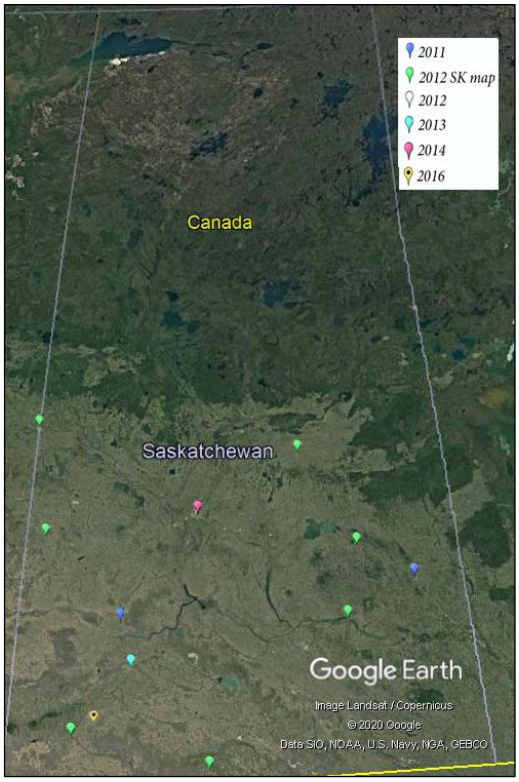

FIGURE 3 APPROXIMATE USE-LOCATIONS OF COMPOUND 1080 IN SASKATCHEWAN 2011 THROUGH 2016. MARKER'S INDICATE COUNTY USE OF COMPOUND 1080 BY YEAR. DATA OBTAINED FROM SK FOIP'S ENV -209-17G AND ENV-558-16G. SOURCE: WOLF AWARENESS INC.

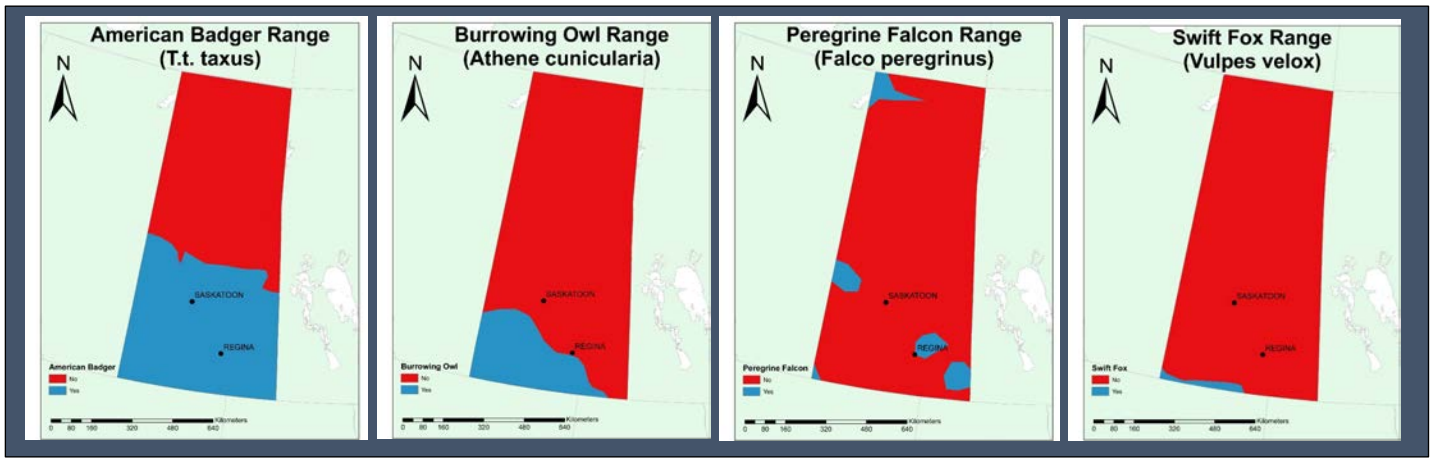

FIGURE 4 MAPS SHOWING SELECTED SPECIES AT RISK RANGES IN SASKATCHEWAN (NOT COMPREHENSIVE).

The use of Compound 1080 in Alberta and Saskatchewan is of especially great concern for species at risk which inhabit rural areas that permit the use of this poison, including but not limited to the following animals:

American badger – *Taxidea taxus*
Federal Status: Special concern (COSEWIC 2012)

Black-footed ferret - *Mustela nigripes*
Federal Status: Extirpated with recovery strategy involving reintroduction in Southern Saskatchewan (Tuckwell and Everest 2009)

Brown (grizzly) bear – *Ursus arctos*
Federal status: Special Concern (COSEWIC 2012)
Provincial Status: Alberta: Threatened
Saskatchewan: N/A

Canada lynx– *Lynx canadensis*
Provincial Status: Alberta: Sensitive (Poole 2003, GoA 2017, GoA 2015)
Saskatchewan: Sensitive (Poole 2003)

Long-tailed weasel – *Mustela frenata*
Provincial Status: Alberta: Sensitive (GoA 2017, 2015)
Saskatchewan: N/A

Swift fox – *Vulpes velox*
Federal Status: Threatened (COSEWIC 2009)
Provincial Status: Alberta: Endangered
Saskatchewan: Endangered

Wolverine – *Gulo gulo*
Federal status: –Special Concern (COSEWIC 2014)

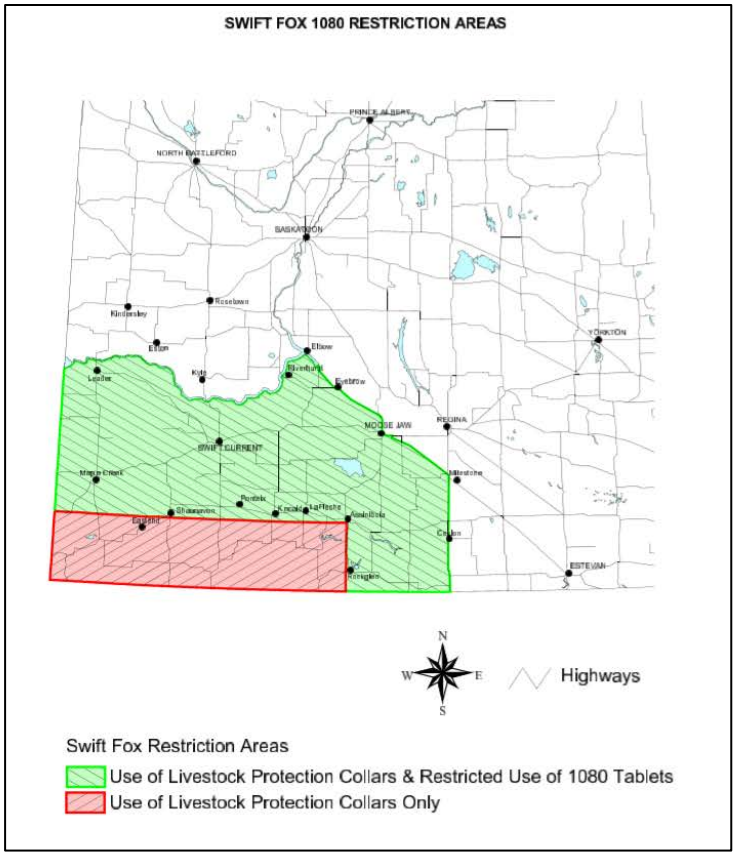

FIGURE 5 MAP SHOWING SASKATCHEWAN'S 1080 SWIFT FOX RESTRICTED AREA ZONES. NOTE THAT COMPOUND 1080 CAN STILL BE USED WITHIN THESE ZONES WITH RESTRICTIONS. SOURCE: SASKATCHEWAN ENV 491/19G

Birds

Tests for toxicity to avian species conducted in 1995 for the U.S. EPA's reassessment of Compound 1080 show that the poison is highly toxic on "an acute oral basis" (1995). The Agency (1995) reviewed toxicity data, which indicate that scavenging birds, mainly raptors, appear to have a lower sensitivity to sodium fluoroacetate than mammals in general. Other avian species appear to be more susceptible to the poison.

Eco-toxicologist Dr. Judit Smits explains that affected non-target victims of Compound 1080 have included owls; hawks; other birds of prey; scavenging birds including vultures, ravens, and magpies; seed-eating birds; insectivorous birds; small mammals; and domestic dogs (Pers. Comm. 16 Oct. 2017).

There is ample published scientific evidence of harm from Compound 1080 to many native bird species in Australia and New Zealand, where this poison has been aerially applied, including: Australasian robins (Powlesland et al. 1998, Powlesland et al. 1999, Powlesland et al. 1999); Wekas (Gallirallus australis) (van Klink and Tansell 2003); Keas (Nestor notabilis) (Easton 2008); Tomtits (Petroica macrocephala) (Powlesland et al. 1998, Powlesland et al. 2000); Fernbirds (*Poodytes punctatus)* (Walker 1997); Moreporks *(Ninox novaeseelandiae*) (Powlesland et al. 1998, Walker 1997, Veltman and Westbrooke 2011); and others (Pollard 2017).

The Canadian Wildlife Service (CWS) and Environment and Climate Change Canada reported in their National Recovery Plan for burrowing owls that data from a study illustrated that the "presence of sodium fluoroacetate-laced grain on the ground surface of a prairie dog town" may have been at least partly responsible for the drastic 71% decline of a breeding colony of burrowing owls for two consecutive years (Hjertass et al. 1995). Burrowing owls, short-eared owls, peregrine falcons, and ferruginous hawks, all federally listed as species at risk through the Committee on the Status of Endangered Wildlife in Canada (COSEWIC), range within areas where Compound 1080 is used, in addition to other birds of prey. The following is a list of some of the bird species exposed to increased risk of mortality where Compound 1080 is being used:

Barred owl - *Strix varia*
Provincial Status: Alberta: Sensitive, Special Concern (GoA 2005)

Burrowing owl – *Athene cunicularia*
Federal Status: Endangered (COSEWIC 2006)

Ferruginous hawk – *Buteo regalis*
Federal Status: Threatened (COSEWIC 2008)

Peregrine falcon - *Falco peregrinus anatum*
Federal Status: Special Concern (COSEWIC 2007)

Prairie falcon - *Falco mexicanus*
Provincial Status: Alberta: Sensitive, Special Concern (GoA 2002)

Short-eared owl - *Asio flammeus*
Federal Status: Special Concern (COSEWIC 2008)

Invertebrates and Fish

Compound 1080 is recognized as a systemic insecticide (EPA 1985). Insects containing residues of this poison, when consumed by insectivores, can result in secondary poisoning (Hegdal et al. 1986, Notman 1989, CCWHC 1999). Notman (1989) found that poisoning of invertebrates occurs with Compound 1080 use and recommended that Compound 1080 should not be used where susceptible invertebrate species or rare insectivores are found. Meads (1994) found evidence of as much as 50% mortality from Compound 1080 among native invertebrates in Whitecliffs Conservation Area, Taranaki. The potential risks of primary and secondary poisoning are increased when poison is deployed in warm weather when insects are most active (CCWHC 1999).

There is very limited information about the effects of Compound 1080 on fish species, but based on the results of tests conducted on rainbow trout (*Oncorhynchus mykiss*) and bluegill sunfish (*Lepomis macrochirus*), sodium fluoroacetate is classified in the EPA's review (1995) as "slightly toxic to cold-water fish species and practically non-toxic to warm water fish species". Given the scientific evidence outlined above regarding the presence of Compound 1080 in lakes and streams, an assessment of the impact of Compound 1080 on fish species is urgently needed.

iv. Water contamination risks

The U.S. EPA has stated that un-degraded Compound 1080 is considered mobile and therefore may move downward in the soil and reach ground water (PDI 2002). The extreme toxicity of Compound 1080, combined with its relatively slow rate of decomposition (Eason 1997) and potential to form significant downstream concentrations in a water supply, pose serious threats to people, other animals and biodiversity.

The 2014 Special Review Decision dismissed concerns raised about persistence and bioaccumulation, stating, (p. 4) "Compound 1080 is highly water soluble and not bio-accumulative, hence it is not expected to be persistent and does not meet any of the Track 1 criteria under the Toxic Substances Management Policy." However, published and unpublished data indicate that for terrestrial uses, small quantities of the chemical can potentially reach and contaminate groundwater (EPA 1995) which could have dire consequences on a variety of animals. For example, Srinivasan et al. (2012) found evidence that Compound 1080 on land entered streams after leaching from baits during rainfall, and recommended that more research is needed to understand the fate of sodium monofluoroacetate during rain events.

Compound 1080 has also been shown to persist in carcasses at hazardous concentrations that remain lethal to various organisms for several months (Defenders 1982, Meenken & Booth 1997, Eason et al. 2010). Furthermore, Compound 1080 decomposes slowly in soil in low temperatures such as those in Canadian winters (King et al. 1994), presenting prolonged risks.

B. Animal Welfare

The use of inhumane methods of pest control should not be condoned (CVMA 2014, Litten et al. 2004, Litten and Mellor 2005, Mason and Littin 2003, Sharp and Saunders 2008, O'Connor 2004, Sherley 2007). After the 2014 Special Review Decision, on July 6, 2014 the CVMA denounced the use of Compound 1080 in a position statement on pest control due to the severe pain and convulsions it causes (CVMA 2014).

Compound 1080 poisoning is widely acknowledged as an inhumane method of killing animals due to the intensity and duration of the suffering it causes (CCWHC 1999, Sherley 2007, CVMA 2014). Animals that ingest it can suffer excruciating pain for several hours or even days before finally losing consciousness. In her review of literature, Sherley (2007) cites several painful or distressing symptoms of Compound 1080 poisoning, stating that most animals that have been poisoned by Compound 1080 present a variety of signs, including: lethargy, retching and vomiting, trembling, fecal and urinary incontinence, severe and prolonged convulsions, unusual vocalizations, hyperactivity, excessive salivation, muscular weakness, incoordination, hypersensitivity to sensory stimuli, and respiratory distress. Compound 1080 creates organ disorders, which can be extremely painful as essential cellular processes break down. Compound 1080 eventually causes death as a result of cardiac failure, central nervous system failure, or respiratory arrest.

It is appropriate that the welfare and distress levels of both target and non-target animals be considered when assessing the humaneness of Compound 1080 (Sherley 2007), although this was not taken into account for the 2014 Special Review. The use of Compound 1080 and other poisons to kill wildlife is in violation of several standards for animal welfare set by experts. The capacity to kill non-target animals

and species through secondary poisoning, combined with the violent symptoms prior to death, render the use of Compound 1080 in direct and obvious violation of 1) the Canadian Council on Animal Care Guidelines for wildlife euthanasia, 2) the Canadian Veterinary Medical Association Guidelines (CCAC 2010, CCAC 2003, CVMA 2014), and 3) the standards set by the International Union for Conservation of Nature (IUCN) in the Wolf Manifesto [No. 7] and Guidelines [No. 5] (Pimlott. 1975, IUCN 2000). As noted in the introductory letter, it is also likely a violation of provincial animal welfare laws, which prohibit causing distress to animals unless the distress results from, *inter alia*, reasonable and generally accepted pest control practices. The use of Compound 1080 to poison predators is not reasonable in light of the above opposition from the veterinary medical community and other experts.

C. Value

The value of Compound 1080 can be summarized as non-existent. Despite its numerous threats to the environment, biodiversity, ecological integrity, animal welfare and human health and safety, Compound 1080 does not prevent future livestock predation events. In fact, alternatives exist which address livestock predation more effectively, such as using trained livestock guardian animals, monitoring domestic animals regularly, and erecting turbofladry (visible barriers to deter predators).

Public attitudes towards wildlife and the health and safety of our environment have changed dramatically since this pesticide was first developed, and non-lethal alternatives have proven to be more effective at reducing livestock depredation.

See Addendum II: Lethal Predator Control and Livestock.

D. Human health and public safety

Compound 1080, for which there is no antidote, poses a serious and unacceptable threat to the health and safety of Canadians. It is labelled as a Class 1a poison (the most toxic category) by the World Health Organization (2009) and considered a super poison by the U.S. EPA. Compound 1080 has resulted in human fatalities in North America (CCWHC 1999). It is a colourless, odourless salt that is highly soluble in water (PMRA 2014) which has been evaluated as a chemical warfare agent (Defenders 1982, Field 2002, PDI 2015) because it can and has killed humans (CCWHC 1999).

According to a group of veterinarians from the Canadian Cooperative Wildlife Health Centre (CCWHC), who completed a review on the use of Compound 1080 for the B.C. Government's Wildlife Branch in 1999, "no poison lethal to wolves or coyotes is harmless to humans" (CCWHC 1999), even though the toxic dose of Compound 1080 necessary to kill a human is significantly higher (per kilogram of body weight) than for canids. The same group reports that Compound 1080 has caused human fatalities and "there is no likelihood of an effective antidote becoming available in the near future" (CCWHC 1999).

The acute toxicity of Compound 1080 renders 48 mg enough to kill a person weighing ~68 kg, with 12mg being enough to kill a ~17 kg child (Defenders 1982). In adults, the lowest effect level of Compound 1080 producing reversible intoxication symptoms was found to be 0.1 mg/kg (Temple and Edwards.

1985, Gonchorav et al. 2006). Symptomatic treatment is only effective in approximately 50% of human cases (PMRA 2015).

As a reason for banning the use of Compound 1080 in the United States (US) in 1972, the EPA listed 13 cases of fatal human poisoning and five suspected cases (Ryden 1981). Saskatchewan's Predacide Training Manual for Compound 1080 (MOE 2015) indicates that during 25 years of the registration of Compound 1080 as a licensed predacide and rodenticide in the U.S., there were 16 human deaths, 12 of which were accidental (Saskatchewan MOE FOIP 2017-558-16G, pg. 140 of 225).

People who handle this poison face potential risk of dermal or respiratory exposure, especially during application of baits, as well as accidental or intentional acute intoxication (Goncharov et al. 2006). The most severe and irreversible consequences of acute poisoning by Compound 1080 are encephalopathia and brain damage (Goncharov et al. 2006). Long after an acute poisoning (from 1.5 to 9 years), psychic disorders, ataxia, tendency for epileptoid seizures, extremity muscular hypertension, spastic tetraplegia, blindness of central (cortical) origin and diffuse brain atrophy were observed (Pridmore, 1978; Trabes et al., 1983, Goncharov et al. 2006).

Farm workers who were chronically exposed to low doses of Compound 1080 for ten years experienced neurologic and mild hepatic dysfunctions and renal tubular lesions were observed (Hayes and Laws 1991, Goncharov et al. 2006).

Due to its extreme toxicity in small amounts, lack of specific taste, and high solubility in water, Compound 1080 has warranted concern as a potential chemical warfare agent. It is highly toxic, has no antidote, and operates in a delayed action (i.e. it has no immediate symptoms), making Compound 1080 highly desirable for this function (Defenders 1982, PDI 2015). The U.S. Federal Bureau of Investigation (FBI) includes sodium fluoroacetate on its list of "highly toxic pesticides" considered likely to be used by terrorists or "for malicious intent" (FBI 2001). In a 2002 article prepared for the National Center for Environmental Assessment, US EPA, Malcolm S. Field - a Senior Research Hydrogeologist with the US EPA - described serious concern surrounding the toxicity and lethal effects of Compound 1080 in a human drinking water system. Field explained that if released in a water supply, Compound 1080 has the potential to produce a significant downstream peak concentration and could have significant human casualties (2002).

E. Label changes inadequate to address concerns in 2014 special review

On May 27, 2014, the PMRA reapproved the use of Compound 1080 in its 2014 Special Review Decision. New label requirements for products containing Compound 1080 were put in place to aid risk-reduction measures for death of non-target species. These included:

- Burying of multi-dose baits for the control of coyotes;
- Placement of tablets deep into cuts made in carcasses to reduce exposure to scavenging birds;
- Destruction and disposal of poisoned carcasses;
- Disposal of vials or unused Compound 1080 product; and
- Addition of a statement prohibiting use of Compound 1080 in designated areas where species at risk exist.

The updated label requirements have not addressed the concerns which triggered the 2014 special review, nor the concerns raised in this request for a number of reasons. First, the placement of tablets deep into cuts made in carcasses to reduce exposure to scavenging birds has proven ineffective. Tablets

placed deep into cuts, as well as the poisoned tissues surrounding these, will eventually become more exposed to scavenging birds (and other animals) as a carcass is consumed.

Even if poisoned carcasses are disposed of or destroyed, there are likely to be poisoned animals that wander off before dying, which are not collected, and therefore remain on the landscape as a threat to others though secondary poisoning. The very first key risk-reduction measure listed under the amendments from PMRA's review on page 4 (2014) is negated on page 5 by stating that in certain circumstances, carcasses killed by coyotes that are left out as "poisoned baits are not required to be buried". In 2014, PMRA removed the following limitation (pg. 7): "remove and destroy poison bait within 30 days of placement between April and October 31st and within 90 days of placement between November and March 31st." Thus, these use restrictions are now lacking in Canada and there is no clear timeframe for removal of baits or of poisoned victims.

With respect to the prohibition of Compound 1080 in designated areas, it is unclear how provincial officials ensure that this requirement is performed by individuals who use Compound 1080 (see below regarding non-compliance with this requirement). Compound 1080 continues to be used in areas inhabited by species at risk.

Livestock protection collars were not re-evaluated during PMRA's 2014 Special Review of Compound 1080, which is disconcerting given the fact that the collars pose serious threats to the environment.

Liquid from the collar may leak onto the remaining carcass and pose a protentional threat to non-target animals (Saskatchewan MOE 2015), including the endangered swift fox. Saskatchewan's rule that producers who use collars follow the 24-hour check times in swift Fox 1080 Restricted areas in southern Saskatchewan, which also coincide with black-footed ferret range, are insufficient to address this concern.

These collars have been known to leak poison, become lost, be chewed through by livestock, and/or become punctured by barbed wire, thorns, etc. (Randall 1981, Defenders 1982, Animal Welfare Institute et al. 2017), causing great risk to sheep and goat handlers (Connolly et al. 1978) as well as myriad non-target animals.

F. Lack of oversight to ensure compliance with conditions of registration

The federal government has delegated responsibility for the application of this highly toxic substance down to the provincial governments. Both Saskatchewan and Alberta have further delegated responsibility for handling Compound 1080 to municipalities and private landowners.

Alberta's official Coyote Predation Control Manual and Study Guide (subject to the province's *Agricultural Pests Act*, RSA 2000, c A-8) transfers the significant responsibility of monitoring, inspecting and training to the local municipal government level. Such fieldmen can receive hundreds of tablets (AF 2017-G-0010 and AF 2019-G-0032), which can then be dispersed to members of the farming community. Requests AF 2017-G-0010 and AF 2019-G-0032 made under Alberta's FOIP Act show that the vast majority of Compound 1080 tabs used in Alberta are handled by landowners, not government inspectors. In 2017 and 2018, more than 90% of Compound 1080 tablets used were issued to landholders (AF 2019-G-0032). Given the extreme care with which this highly toxic substance must be

handled and stored, it is irresponsible to allow unlicensed and untrained landholders to introduce Compound 1080 into the environment. In contrast, other highly toxic compounds such as euthanizing solution and opiates used in veterinary medicine are rigorously controlled, with only veterinarians who have special licenses having access or use of those compounds. Yet Compound 1080 is available to numerous people with unknown training, knowledge, and licensing, or ability to control and track the effects of using the product.

The situation in Saskatchewan is similar. Although it requires government personnel using Compound 1080 (Conservation Officers and Saskatchewan Crop Insurance Corporation predation specialists) to be certified through training, the delicate responsibility of handling this product is then handed over to landowners. Compound 1080 tablets are given out to landowners by county pest control staff (in large volumes each year) and landowners are allowed to apply the protection collars themselves (pg. 37-38 and 56-57 of Saskatchewan Access Request ENV 491/19G). To further delegate responsibility, the provincial Ministry of Environment's *Policy and Guidelines for Use of Compound 1080 in Saskatchewan* instructs that "Ministry of Environment staff will require that prior to deployment of 1080 tablets the landholder sign a waiver form absolving the Ministry of any responsibility for death or injury of any nontarget animals including livestock, guardian animals or pets," (pg. 57 of Saskatchewan Access Request ENV 491/19G). This mandatory waiver reflects the known and substantial risks associated with using the toxicant.

Ultimately, Alberta and Saskatchewan are the registrants of products containing Compound 1080. Therefore, the legal duty is theirs to ensure that the conditions of registration are complied with (PCPA ss 6, 25, 31).

As noted in the introductory letter to our request for Special Reviews, Alberta's and Saskatchewan's animal welfare laws prohibit causing distress to an animal unless the distress is caused by an activity carried out in accordance with, inter alia, reasonable and generally accepted pest control practices. Distress to animals caused by the use of Compound 1080 contrary to label requirements is thus a contravention of these provincial laws.

G. Non-compliance with label requirements

Section 6(5) of the PCPA prohibits the handling, storage, transportation, use or disposal of a pest control product in a way that is inconsistent with the regulations under the PCPA or the directions on the label recorded in the Register. It is an offence for a registrant to not comply with the conditions of a registration (s 31 (1)). Furthermore, section 25 of the Act states that the Minister "may cancel or amend the registration of a pest control product if the registrant does not comply with the conditions of registration."

We undertook an investigation which showed that between 2011 and 2018, standards for monitoring and reporting of Compound 1080 use were lax and inadequate. Records obtained through the FOIP request process for the periods between January 1, 2011 through December 31, 2018 indicate that Compound 1080 products are not being used in compliance with label requirements and thus public safety, environmental health, and animal welfare are at even greater risk due to the dangers of this broad-spectrum poison.

As set out below, individuals are not using Compound 1080 in a way that is consistent with the directions required under the PCPA, which is a violation of subsection 6(5). Serious and valid concerns for human safety and the environment are exacerbated by non-compliance with label directions, which include i) failure to recover and dispose of poisoned baits and carcasses, ii) using toxicant in ranges occupied, or potentially occupied, by swift fox and other endangered species, iii) inadequate record keeping, and iv) use of Compound 1080 in jurisdictions without a permit.

i. Failure to recover and dispose of poisoned baits and carcasses

One of the label requirements for products containing Compound 1080 in Canada is *Destruction and disposal of poisoned carcasses* (PMRA 2014). During our efforts to gather records, we determined that between 2011 and 2016, thirteen cases were reported in Alberta where Compound 1080 baits had been set and consumed but no carcasses were recovered (AEP 2018 [E17-G-0418]). Several other records failed to provide information after baits were set (AEP 2018 [E17-G-0418]), making it fair to assume that no bait piles or carcasses were recovered for proper disposal, due to the fact that some records clearly indicate when this has occurred.

The following Occurrence Reports provided through E17-G-0418 indicated that carcasses were not recovered after baits were consumed:

File Number 13-23192

File Number 14-9712

File Number 14-13099

File Number 14-13262

File Number 14-19667: "although only 2 wolves were picked up, it appeared several others *may* have been removed"

File Number 15-6177

File Number 15-6486

File Number 15-8090

File Number 15-8694

File Number 16-13551

File Number 16-14758

File Number 16-18635

File Number 16-9969

The following file numbers from Occurrence Reports provided through E17-G-0418 provided no further information following placement of 1080 baits:

File Number 14-10156

File Number 14-10568

File Number 14-12329

File Number 14-13314

File Number 15-2588

File Number 15-3266

File Number 15-4817
File Number 15-6223
File Number 15-6667
File Number 15-7259
File Number 15-7317
File Number 15-9162
File Number 15-10041
File Number 15-10163
File Number 15-10506
File Number 15-12059
File Number 15-13258
File Number 15-13814
File Number 15-15830
File Number 15-15837
File Number 16-5432
File Number 16-7193
File Number 16-9033

Compound 1080 Utilization Records from Saskatchewan (Saskatchewan 2017 [ENV 209/17G]) also lacked required information regarding the disposition of baits, or carcasses. Occurrence Report E1402149 showed that eight Compound 1080 tablets were consumed with no carcasses recovered.

Given the delayed onset of symptoms that canids experience after consuming Compound 1080, there is no control over recovering toxic carcasses, despite what the text on the label reads. Since these label requirements cannot be met, the toxicant should not be used.

ii. Use of Compound 1080 in swift fox and other endangered species ranges

In 2014, the PMRA added five Additional Key Risk-Reduction Measures in an effort to address potential environmental risks identified in the 2014 Special Review Decision for Compound 1080 (PMRA 2014). One of these statements included "use directions relating to addition of a statement prohibiting use of Compound 1080 in designated areas where species at risk exist."

Compound 1080 and other predacides are being used in Alberta and Saskatchewan in several areas where various species at risk range and are vulnerable to this poison. Indeed, Saskatchewan's most sensitive swift fox 'zone of restricted use' for Compound 1080 still allows for and is using Livestock Protection Collars. Although Saskatchewan requires that LPC's must be monitored every 24 hours in the swift fox protection area, foxes are still exposed to risk if collar content leaks onto the remaining carcass and/or from secondary poisoning from unrecovered poisoned carcasses (figure 5).

iii. Inadequate record-keeping and evidence of poor storage and handling

We found that record-keeping was poor and inadequate on the part of both Alberta and Saskatchewan. Alberta's Permit No. 18300 requires that "the user of tablets must monitor and keep accurate records on the use of each poisoned bait."

However, upon review of a copy of the spreadsheets summarizing the Annual Reports submitted by all municipal districts and counties to the Inspection and Investigation Section, Animal Health and Assurance Branch of Alberta Agriculture and Forestry between Jan. 1 2011 and Dec. 31 2018 (AF 2017-G-0010 and AF 2019-G-0032) and a review of all Alberta government records pertaining to the use of Compound 1080 during the same time period (E17-G-0418), we established that data and records are missing from several jurisdictions in Alberta - see Appendix 1. For example, data was missing for Mackenzie in 2012, 2013, 2016 and 2017, despite records indicating that Compound 1080 was used in this county during 2011, 2014, 2015 (AF 2017 – G-0010) and 2018 (AF 2019-G-0032). Similarly, data for Compound 1080 was missing for the County of Willowcreek in 2012, 2013, and 2016 (AF 2017 – G-0010) although records indicate that the poison was used in 2015 and 2018 (AF 2019-G-0032).

Some use reports provided no information after Compound 1080 bait was set (E17-G-0418). This is further disconcerting given that label requirements call for proper disposal of the toxic substance and carcasses, yet records indicate that this obligation is not being met.

Also concerning to read in reports provided were descriptions of tablets "melting", "crumbling", or "dissolving", which indicates improper storage of the tablets (AF 2017-G-0010, AF 2019-G-0032). This is inconsistent with label requirements (for permit no. 18300) which require the following: "Store sodium monofluoroacetate tablets under lock and key in a dry place away from food, feed, domestic animals, and corrosive chemicals."

Despite the requirement of Saskatchewan's Permit No. 25857 that "[a] complete record of the use of this product including the date and land location where baits were placed, the success, impact on non-target species and amount of toxicant used, must be maintained by all users of the product, and the information submitted yearly to the Fish and Wildlife Branch", we found that some of the Saskatchewan Environment 1080 Utilization Record Forms from 2011-2016 which we reviewed were incomplete. Some lacked information on disposition of baits/collars and/or carcasses. For example, Occurrence Report E1402149 indicated that eight Compound 1080 tablets were consumed (with no carcasses recovered), yet the number of target and non-target species taken was recorded as "unknown". It is unclear how the user was able to confirm consumption of the tablets. Additionally, Saskatchewan Environment 1080 Utilization Record Form dated Sept. 14, 2011 indicates that twelve Compound 1080 tablets were used but no information is provided regarding disposition of baits/collars and/or carcasses.

Labels, instructions and warning signs cannot prevent public safety or environmental damage incidents if they are not being heeded. In addition, human error, accidents and mistakes occur and are highly possible when handling this highly toxic substance. There is also the possibility of intentional misuse. Given the high toxicity of this poison, even sporadic non-compliance with Health Canada's conditions for use supports the position that the risks outweigh any perceived benefit.

iv. Toxicant used illegally in jurisdictions without a permit

Compound 1080 has recently shown up in places where it is not permitted, which reinforces concerns surrounding misuse of this highly dangerous poison as long as it is available in the country.

Use of Compound 1080 was discontinued in British Columbia in 1998. Despite not having a permit in nearly two decades, the poison has appeared in the area of Cranbrook where it has killed family pets (CBC 2017), see Appendix 2. Several of the dog victims that presented symptoms of Compound 1080 poisoning were treated at the Steeples Veterinary Clinic, which sent three of the deceased animals' remains for pathology tests in which Compound 1080 toxicosis was confirmed (Pers. Comm. A. Skaien Nov. 20, 2019 and Aug. 5 2020). Toxicology results indicate that in 2018 at least two dogs were poisoned by Compound 1080. The toxicology results from a third dog poisoned by Compound 1080 in 2020 suggest that secondary poisoning had occurred (Pers. Comm. A. Skaien Aug. 5 2020 and Appendix 2). Other dogs and wildlife reported poisoned were not tested as this can be an expensive and time-consuming procedure. For example, in 2020 a second dog that walked the same trails on the same day of the confirmed Compound 1080 death also died that day after presenting similar symptoms, but no toxicology tests were performed.

During our investigation into the use of predacides in Canada, it has become obvious that most people in Canada, including veterinarians and vet clinic staff, Conservation Service Officers, RCMP staff, and the general public are not aware of the protocol for reporting incidents to the PMRA. As such, we believe that there is under-reporting of non-target deaths to pets and domestic animals, and that the number of actual victims is higher. An additional consideration is that not all poisoned dogs are subject to toxicology tests, as this can be cost-prohibitive.

The fact that Compound 1080 is being used in British Columbia without a legal permit provides further evidence that this poison is not being controlled responsibly. Compound 1080 is crossing borders and being used where it is not authorized, putting people, pets, and wildlife at risk across Canada as long as this product is available. Despite an investigation by the RCMP in Cranbrook, there were no suspects and no charges (Pers. Comm. A. Skaien Nov. 20, 2019). The easy access of this dangerous compound resulted in the death of several dogs. The deaths led to personal loss for families who also faced costly veterinary bills; fear within the community; the public expense of an RCMP investigation; finances taken from Recreation Sites and Trails BC (E-know.ca 2018) where dogs ate the poison; and the inhumane death of wild canids and an unknown number of other non-target animals, which involved an investigation by the Conservation Officer Service (B-104 News. 2017).

H. Other jurisdictions

i. United States

In February of 1972, U.S. President Nixon signed an Executive Order which prohibited the use of chemical toxicants as predacides and prohibited toxicants that caused secondary poisoning on federal lands or by federal agencies (Fagerstone et al. 1994, Defenders 1982).

Following this, the U.S. EPA ordered cancellation and suspension of Compound 1080 as a predacide in March 1972. The banning of the poison was due to its high toxicity and opposition to its use on the part

of scientists and conservation organizations (Defenders 1982, Randall 1981). The ban also followed the release of the Cain Report (1971), a federal study on managing predators which rated the overall use of Compound 1080 as poor as a control technique. The Cain Report is considered a landmark in the U.S. when questioning the humaneness of methods surrounding predator control (Defenders 1982).

The EPA determined the following risks were met or exceeded by Compound 1080:

i) lack of emergency treatment;
ii) acute toxicity to mammalian and avian species;
iii) significant reductions of non-target organisms; and
iv) fatalities to members of endangered species.

Since the predacide ban in 1972, Compound 1080 has not been used in the USA federally for general predator control. However, heavy lobbying from the livestock production industry resulted in Compound 1080 becoming once again legalized by the EPA in 1986, although restricted conditions include that it be used only in Livestock Protection Collars and handled only by trained and certified applicators ((Burns and Connolly 1995, EPA 1995). This is in contrast to Canada, where LPCs are handled by landowners with no requirement that they be handled only by trained and certified applicators to protect human health and the environment.

The decision to allow the use of LPCs was controversial and was appealed unsuccessfully by fourteen conservation groups (Sibbison 1984). Their use remains highly controversial. Voters in California and Washington states voted to ban the use of Compound 1080 livestock collars in 1998 and 2000, respectively. The Governor of Oregon banned the use of the collars in 1998 (API 2002), where they have not been used since. In 2009, the EPA was forced to reinitiate consultation with the Fish and Wildlife Service in response to a petition filed by Sinapu and ten other groups (EPA Web Archive). The petition was in response to public concern that threatened and endangered species were being harmed by Compound 1080 from LPC's and by M-44 sodium cyanide ejectors. The Agency denied the petitioners' request to cancel and suspend the registrations of these pesticides. (EPA Web Archive).

In March 2017, US Congressman Rep. Peter DeFazio introduced legislation to ban Compound 1080 and sodium cyanide in bill H.R. 1817, called the *Chemical Poisons Reduction Act* (Defazio 2017). The bill is supported by the national wildlife advocacy group Predator Defense, as well as the US Humane Society. The Congressman's bill introduction came shortly after five animal welfare and conservation organizations submitted a petition to the EPA seeking cancellation of the registration for Compound 1080 in the U.S.

ii. Organization for Economic Co-operation & Development Countries

The Minister has responsibilities and obligations to Canadians and the Canadian environment. If and when another country belonging to the OECD bans all uses of an active ingredient for health or environmental reasons, the Minister is required to initiate a special review of registered pest control products containing that active ingredient (PCPA s 17(2)). As explained below, several OECD countries have banned the use of fluoroacetic acid and/or Compound 1080 for use in agriculture. While this does not meet the high threshold set out in section 17(2) of the PCPA as a ban on all uses, it nonetheless

warrants consideration by the Minister and further demonstrates the need for a special review under section 17 of the Act.

Germany, Korea, and Slovenia are examples of OECD countries that have banned this substance or its derivatives for some or all uses. Several countries around the world have banned Compound 1080 or a derivative of it on the grounds of risks associated with human health and/or the environment, including the following:

Fluoroacetic acid bans

Country	Effective	Description of Action Taken	Grounds for decision
Austria[1]	1992	Banned.	High acute toxicity to man and to other mammals and birds.
Germany[1,*]	1986	Fluoroacetic acid and its derivatives are prohibited for use as plant protectant.	
Panama[1]	1987	Fluoroacetic acid and derivatives: import and use prohibited for agriculture.	
Slovenia[1,*]	1997	Fluoroacetic acid and its salts are banned for use in agriculture.	Due to the effect of its toxic properties on human health and the environment according to the opinion given by the Commission on Poisons.

Fluoroacetimide (1081) bans

Country	Effective	Description of Action Taken	Grounds for decision
Brazil[2]	2002	Pesticides and its compounds are banned and need to be registered by the Federal Authority prior to production, export, import, trade or use.	
Bulgaria[2]	2004	All formulations are banned for use except for research or laboratory purposes.	
Côte d'Ivoire[2]	1998	Banned.	Not been registered, therefore it is prohibited to produce, sell and use this product.
China[1]	1982	Use of agricultural products and of raticides containing fluoroacetamide is prohibited.	Fluroacetamide's high toxic effects on human health.
Cyprus[1]	1991	Withdrawn by the manufacturer. No remaining uses allowed.	Health risks and environmental hazard due to its high acute toxicity to mammals, birds and other nontarget species.
Gambia[1]	1997	Banned.	
Guyana[3]	2006	Banned.	

Korea[1,*]	1991	Banned for production, import, use and sale of both this substance and preparations containing it.	Action taken due to high oral toxicity.
Kuwait[1]	1975	Banned for use as a pesticide. No remaining uses allowed.	Action was taken for health reasons.
Nigeria[2]	1998	Banned.	
Pakistan[1]		Prohibited. Never registered.	
Panama[1]	2002	Banned.	
Philippines[1]	1981	Banned.	High toxicity to mammals, highly toxic by ingestion and by skin absorption.

Sodium fluoroacetate (1080) bans

Country	Effective	Description of Action Taken	Grounds for decision
Belize[1]	1985	Banned.	Extremely and acutely toxic
Cape Verde[3]	1990	Banned.	
Columbia[1]	1969	Prohibition of sale of pesticides with this ingredient. Export is permitted with the requirement of foreign notification regarding domestic restrictions on use.	The Ministry of Health has cited serious health risks associated with its use.
Cuba[1]	1990	Banned for use, production and import as a pesticide.	Because of its high toxicity has caused an important number of cases of poisoning.
Germany[1,*]	1985	Not registered as a pesticide.	
Philippines[1]		Banned for use and sale.	
Slovenia[1,*]	1991	Banned for use in agriculture.	Due to effect of toxic properties on human health and the environment.
Thailand[1]	1995	Banned.	High acute toxicity to man and animals.

[1] Consolidated List of Products - Whose Consumption and/or Sale Have Been Banned, Withdrawn, Severely Restricted or Not Approved by Governments, Eleventh Issue - Pharmaceuticals. United Nations - New York. Accessed April 27, 2020: https://www.un.org/esa/coordination/CL11.pdf

[2] Consolidated List of Products - Whose Consumption and/or Sale Have Been Banned, Withdrawn, Severely Restricted or Not Approved by Governments, Thirteenth Issue – New data only Dec. 2004 – Dec. 2006 Pharmaceuticals. United Nations - New York, 2009 Accessed April 27, 2020: https://www.un.org/esa/coordination/Consolidated.list-13FinalFinal.pdf

[3] Consolidated List of Products - Whose Consumption and/or Sale Have Been Banned, Withdrawn, Severely Restricted or Not Approved by Governments, Fifteenth Issue – New data only June 2007 – June 2009 - Pharmaceuticals. United Nations - New York, 2009. Accessed April 27, 2020: https://www.un.org/esa/coordination/CL-15-Final.for.Printing.pdf

* OECD member-country

III. Conclusion

Under Section 17(4) of the PCPA, we are formally requesting a special review by the Minister of the registration of all products containing Sodium Monofluoroacetate (Compound 1080), or fluoroacetate derivatives, and requesting that Canada ban the use of these products for any purpose.

The evidence above demonstrates the unacceptable danger that Compound 1080 poses to wildlife, and thus the environment, through primary and secondary poisoning of non-target animals. It also shows that baits are often taken by non-target individuals, as documented in British Columbia. Furthermore, secondary poisoning is exacerbated through the delayed metabolism with which canids succumb to the poison, thus placing poisoned carcasses far from where the poison was ingested so as not to be retrieved and posing a risk to scavengers.

Compound 1080 constitutes a clear and serious danger to the environment which can no longer be misrepresented as an acceptable risk. It is more than a risk. It is a known certainty that baits are often taken by non-target animals, and that the delayed onset of symptoms experienced by canids facilitates the spread of this poison over a vast landscape which increases likelihood of secondary poisoning. It is also a known certainty that target and non-target animals poisoned by Compound 1080 will experience extreme and prolonged suffering prior to death.

In addition, the high solubility in water and long time necessary to break this extremely toxic compound down render it dangerous for prolonged periods of time.

The value of these products is unacceptable given that they are not effective at reducing loss of livestock and there are other methods to achieve this objective that are safer, more effective, and better for the environment and the welfare of animals.

Compound 1080 also poses significant risk to human health and safety should a small amount enter public drinking-water systems. Aside from dangers presented at the population level, the suffering one individual would endure by ingesting this poison (by accident, malicious intent, or with purpose), presents an incredibly tragic scenario that is completely unnecessary.

In light of the unacceptable risks posed by these products, their lack of value, and the precautionary principle of domestic and international environmental law, as enshrined in the PCPA, we urge the Minister to take swift action to protect the Canadian environment from the dangers of Compound 1080 by cancelling the registration of pest control products containing this substance.

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FOIPs:

AF 2017-G-0010 and **AF 2019-G-0032**: Alberta records missing from several jurisdictions, landowner use and deterioration of tablets

E17-G-0418: Alberta 13 cases reported where 1080 baits had been set and consumed but no carcasses were recovered

ENV 209/17G: Saskatchewan baits were consumed without any carcasses recovered and lack required information regarding the disposition of baits, collars, or carcasses.

3 **toxicology reports** prepared for Steeples Vet in BC

APPENDIX 1 Jurisdictions in Alberta and Saskatchewan reporting Compound 1080 use

A. List of Alberta counties using Compound 1080 between 2011- 2018 (Ref: Alberta FOIP requests AF 2017-G-0010 and AF 2019-G-0032). Yellow cells indicate missing information (no data).

LANDOWNER USE = No. of 1080 tablets										INSPECTOR USE = No. of 1080 tablets							
County	**Region**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**Total 2012-18**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**Total 2012-18**
Athabasca	NW	48	46	16	13	8	24	69	224	70	58	40	96	47	30	34	375
Barhead #1	NW	36	44	30	60	20	40	47	277		15			5			20
Beaver	NE	74	91	96	48	0	6	12	327								
Big Horn		0		0	0	0	0	0	0								
Big Lakes	Peace	13	12	19	102	45	12	3	206								
Birch Hills	Peace				0		0	0	0								
Blood Reserve	South								0								
Bonnyville	NE	46	18	34	30	6	12	6	152								
Brazeau	NW	5		0	6	17	0	0	28								
Camrose	Central	32	29	35	36	35	8	21	196								
Cardston	South	9	35	9	0	34	18	0	105								
Clearhills	Peace	6	6	12	12	12	6	0	54					6			6
Clearwater							0	0	0					26			26
Crowsnest Pass		0							0	0							
Cypress	South	63	14	30	0	24		0	131				0		6		
Fairview	Peace	42	42	38	42	18	32	32	246								
Flagstaff	Central	13		0	6	3	0	0	22	3							3
Foothills	South	0	0	0	0	0	0	6	6								
Fortymile	South	18		0	0	0	0	0	18								
Grand Prairie	Peace	6	4				18	15	43			34	26	10		6	76
Greenview	Peace	15		0	3	0	0	3	21						16		16
Kneehill	Central	0	5	4	0	0	0	0	9				0				
Lac La Biche		12	14	6	21		0	6	59					14			14
Lac St Anne	NW	42	24	25			6	10	107		5		12	3		2	22
Lacombe	Central	7	3	12	12	4	0	0	38								
Lamont	NE	42	36	12	18	6	18	24	156								
Leduc	NW	0	0	3	0	0	0	0	3								
Less Slave R	NW	24	0	12	28	45	0	0	109			8					8
Lethbridge	South	6	0	0	0	0	0	0	6								
Mackenzie	Peace			36	66			122	224								
Minburn	NE	200	150	20	60	50	45	50	575								
Mountainview	Central	19	13	4	2	12	0	0	50								
Newel	South	193	105	25	93	18	40	76	550								
Northern Lights	Peace	108	48	134	71	36	78	39	514			6	7	22	18	18	71
Northern Sunris	NW	11			0	24	5	2	42								
Paintearth	Central	5	42	17	0	12	12	47	135				0				
Parkland	NW	12	6	6	23	5	13	3	68								
Peace #135	Peace	0	0	0	36	17	0	0	53								
Pincher Creek #	South	0	0	0	0	0	0	0	0								
Ponoka	Central	23	16	11	12	0	6	6	74			7					7
Provost	NE	90		90	50	10	40	25	305								
Ranchland				0	0		0	0	0								
Red Deer	Central	20	26	8	0	12	0	8	74				0				
Rocky View	Central	65	14	31	45	15	66	55	291								
Saddle Hills	Peace		0	0	0	0	0	12	12								
Smokey River	Peace	0		0	8	0	5	0	8								
Smoky Lake	NE	147		57	68	39	36	18	329								
SP Areas 2	South	106		27	34	6	21	30	203	12							12
SP Areas 3	South	21	17	7	60	6	36	42	189								
SP Areas 4	South	12	31	9	6	6	0	0	64								
Spirit River	Peace	0			0	0	0	0	0								
St Paul	NE	108	124	66	78	60	60	30	526								
Starland	Central	6	0	6	0	0	0	0	12								
Stettler	Central	28	5	0	0		0	17	50								
Strathcona	NW	0	0		0		0	0	0		0						
Sturgeon	NW	0		0	0	0		0	0								
Taber	South	30	33		60	20	20	30	173								
Thorhild	NW	0	8	20	43	88	84	87	330								
Two Hills	NE	64		10	45	10	8	50	179								
Vermillion	NE	67	52	35	54	19	16	14	257		18	5	22	21			66
Vulcan	South	6		0	0	0	0	12	18								
Wainright	NE	9	6	9	4	0	0	3	31								
Warner	South	33	0	0	0	0	0	0	33	6	0						6
Westlock	NW	51		42	18	12	12	12	135								
Wetaskiw'in	Central	43	36	24	12	36	53	50	254	4	0						4
Wheatland	South	30	0	0	0	0	0	0	30		0		0				
Willow Creek	South			0	3		0		3	3						3	3
Woodlands	NW	18	6	54	42	0	6	6	132								
Yellowhead	NW	18	0	12	42	36	12	18	138	0							
TOTAL		2101	1161	1153	1472	826	874	1118	8604	98	96	100	163	154	70	63	735
					1472												
Alberta		**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**7-yr min**								
Inspector		**98**	**96**	**100**	**163**	**154**	**70**	**63**	**744**								
Landowner		**2102**	**1161**	**1153**	**1472**	**826**	**874**	**1118**	**8706**								
TOTALS		2200	1257	1253	1635	980	944	1181	9450								

Data obtained from Alberta FOIP's AF 2017-G-0010 and AF 2019-G-0032

B) List of Saskatchewan municipalities using Compound 1080 between 2011- 2017. (Ref: Saskatchewan FOIP requests ENV 209/17G and ENV 558/16G).

Note that swift fox 1080 Restriction Areas came into effect after the 2014 Re-evaluation decision.

County	**Date**	**Notes**	**Additional**	**Reference**
Eastend	2012 or earlier	SK 2012 map	Swift fox restricted zone	ENV 558/16G
Foam Lake	2012 or earlier	SK 2012 map		ENV 558/16G
Fort Qu'Appelle	2012 or earlier	SK 2012 map		ENV 558/16G
Killdeer	2012 or earlier	SK 2012 map	Swift fox restricted zone	ENV 558/16G
Kyle	2011			ENV 209/17G
Lloydminster	2012 or earlier	SK 2012 map		ENV 558/16G
Major	2012 or earlier	SK 2012 map		ENV 558/16G
Melfort	2012 or earlier	SK 2012 map		ENV 558/16G
Saskatoon	July 2014	8 tabs, all eaten. Deaths-unknown.	Occurrence Report E1402149	ENV 209/17G
Shaunavon	July 2016	LPCs were not used but were available.	Swift fox restricted zone	ENV 209/17G
Swift Current	July-Aug 2013			ENV 209/17G

APPENDIX 2: Compound 1080 confirmed in BC toxicology tests 2020 and 2018

NDSU VETERINARY DIAGNOSTIC LABORATORY

Dept. 7691, Fargo, ND 58108-6050
t: (701) 231-7527 f: (701) 231-7514
e: ndsu.vetlab@ndsu.edu

Date › 07/31/20

Accession No. › **20-7495**

Ref. Vet ›

Sample(s) Collected ›

Ref. ID › 40284-2019552

Bill To › PRAIRIE DIAGNOSTIC SERVICES

Sample(s) Received › 07/08/20

Species › Dog

PRAIRIE DIAGNOSTIC SERVICES
52 CAMPUS DRIVE
SASKATOON, SASK, CANADA, SK S7N 5B4

BREANNE LIEUWEN
NO ADDRESS PROVIDED

Final Report

Toxicology

Sodium Monofluoroacetate

Sample ID	Specimen	Level
40284-2019552	Kidney	12.2 ppb

Comments:
Sodium Monofluoroacetate or 1080 Comments: The kidney was positive at 12.2 ppb (ug/kg). Generally, this low level positive concentration in the kidney is associated with a secondary poisoning with the animal consuming a primary animal that died with 1080 toxicosis.

The kidney tissue was extracted, partitioned into ethyl acetate, derivatized and analyzed by gas chromatography/mass spectrometry. The detection limit is 10 ppb.

This report was authorized by:

M.S. Mostrom, DVM, PhD Diplomate ABVT, ABT(1995-2020)

— End of Report —

Cornell University
Animal Health Diagnostic Center
240 Farrier Road, Cornell University, Ithaca, NY 14853
Ph: 607-253-3900 Fax: 607-253-3943
https://ahdc.vet.cornell.edu

Interim Report

Owner: [redacted]

Accession Number: **007449-18**

Steeples Veterinary Clinic - (253578)
3410 Victor Road
Cranbrook, BC Canada V1C 7B7,
(250) 489-3451

Sampled: Not Given
Received: 01/17/2018
Finalized:
Reference Number: [redacted]

Anatomic Pathology

Department of Biomedical Sciences
Director Dr. Elizabeth Buckles
Phone: 607-253-3319 | Fax: 607-253-3357

1 **Topaz** - Canine German Shepherd Spayed
Body, Whole
Necropsy, Final - results pending

Referrals

Director Dr. Korana Stipetic - 607-253-3546

Referral, General Code

Item		Result	Reference Interval
1	Topaz - Canine German Shepherd Spayed Tissue, Pooled	Sodium Monofluoroacetate: 273 ppb Ref Destination: North Dakota State Diagnostic Laboratory Ref Case No: 18-684	

Comments: Sodium Monofluoroacetate:

Comments:
The fluoroacetate concentration in the kidney tissue was 273 ug/kg(ppb), which is a significant diagnostic concentration and confirms sodium Monofluoroacetate or compound 1080 toxicosis in the animal.

Tissue concentration of fluoroacetate greater than 10 ppb are interpreted as positive for Sodium Monofluoroacetate. Tha analysis is performed by GC/MS using a 14 Carbon labled fluoroacetate and scintillation counter to correct for recovery of sample.

In an attempt to provide outstanding customer service and quality test results the above sample(s) have been forwarded to an outside laboratory for testing. Whenever possible, an AAVLD accredited laboratory is chosen for testing we refer. The fees for this testing are based upon the testing laboratorys current test fee. Additional charges may be incurred due to administrative fees and/or hazardous waste/disposal fees charged by the sample testing laboratory. A separate fee is charged by the AHDC for the handling, packaging, and shipping of samples to other labs. Thank you for your continued confidence in our services.

Samples shipped during colder months risk being frozen in transit, damaging them for the testing requested. Please visit http://bit.ly/AHDCBigFreeze for suggestions on how to protect your samples this winter.

Cornell University
Animal Health Diagnostic Center
240 Farrier Road, Cornell University, Ithaca, NY 14853
Ph: 607-253-3900 Fax: 607-253-3943
https://ahdc.vet.cornell.edu

Interim Report

Accession Number: **007435-18**

Owner: [redacted]

Steeples Veterinary Clinic - (253578)
3410 Victor Road
Cranbrook, BC Canada V1C 7B7,
(250) 489-3451

Sampled: Not Given
Received: 01/17/2018
Finalized:
Reference Number: [redacted]

Anatomic Pathology

Department of Biomedical Sciences
Director Dr. Elizabeth Buckles
Phone 607-253-3319 | Fax 607-253-3357

1 **YaYa** - Canine Labrador Retriever Female
Body, Whole
Necropsy, Final - results pending

Referrals

Director Dr. Korana Stipetic - 607-253-3546

Referral, General Code

Item		Result	Reference Interval
1	YaYa - Canine Labrador Retriever Female Tissue, Pooled	Sodium Monofluoroacetate: 279 ppb Ref Destination: North Dakota State Diagnostic Laboratory Ref Case No: 18-683	

Comments: Sodium Monofluoroacetate:

Comments:
The fluoroacetate concentration in the kidney tissue was 279 g/kg(ppb), which is a significant diagnostic concentration and confirms sodium Monofluoroacetate or compound 1080 toxicosis in the animal.

Tissue concentration of fluoroacetate greater than 10 ppb are interpreted as positive for Sodium Monofluoroacetate. Tha analysis is performed by GC/MS using a 14 Carbon labled fluoroacetate and scintillation counter to correct for recovery of sample.

In an attempt to provide outstanding customer service and quality test results the above sample(s) have been forwarded to an outside laboratory for testing. Whenever possible, an AAVLD accredited laboratory is chosen for testing we refer. The fees for this testing are based upon the testing laboratorys current test fee. Additional charges may be incurred due to administrative fees and/or hazardous waste/disposal fees charged by the sample testing laboratory. A separate fee is charged by the AHDC for the handling, packaging, and shipping of samples to other labs. Thank you for your continued confidence in our services.

Samples shipped during colder months risk being frozen in transit, damaging them for the testing requested. Please visit http://bit.ly/AHDCBigFreeze for suggestions on how to protect your samples this winter.

APPENDIX 3: PERMIT CONDITIONS for Compound 1080 tablets and collars

Registration Number	Registrant Name	Product Name	Registration Status
18300	ALBERTA GOVERNMENT/ALBERTA AGRICULTURE & FORESTRY	SODIUM MONOFLUOROACETATE PREDACIDE	REGISTERED

SODIUM MONOFLUOROACETATE PREDACIDE

COYOTE CONTROL AND WOLF CONTROL

RESTRICTED
READ THE LABEL BEFORE USING

DANGER POISON

GUARANTEE: Sodium monofluoroacetate 5 mg per tablet REGISTRATION NO. 18300 PEST CONTROL PRODUCTS ACT NET CONTENTS: 5 mg per tablet GOVERNMENT OF THE PROVINCE OF ALBERTA

Department of Agriculture and Forestry 3115 5th Ave. North Lethbridge, Alberta T1J 4C7

NOTICE TO USER:

This pest control product is to be used only in accordance with the directions on the label. It is an offence under the Pest Control Products Act to use this product in a way that is inconsistent with the directions on the label. The user assumes the risk to persons or property that arises from any such use of this product.

NATURE OF RESTRICTION:

This product is for storage, use and handling only by persons authorized under the Alberta Agricultural Pests Act and by designated Fish and Wildlife Officers of the Government of Alberta.

RESTRICTED USES:

COYOTE

Single Dose Bait

Place one tablet into a bait of about 100g (e.g. chicken head). Place up to three of these poisoned baits at a coyote site. Cover treated baits with 5 - 10 cm of soil, snow, vegetation or other material to prevent exposure to birds. Limitations 1 through 7 inclusive, 12 through 16 inclusive

Multi Dose Bait

Place up to six tablets into a carcass at a coyote control site and then cover with 30 cm of snow or 15 cm of loose soil. For targeting specific individual coyotes, place up to three tablets into a coyote killed carcass at the predation site. Limitations 1 through 7 inclusive, 12 through 16 inclusive.

WOLF

Small Bait

Place three tablets into a bait of about 100g. Conceal up to six of these baits under approximately 30 cm of snow or 15 cm of loose soil along trails leading to an unpoisoned carcass or in a circle around an unpoisoned carcass.

Limitations 8 through 13 inclusive

Large Bait Place up to twelve tablets into a carcass that is securely anchored. Cover the bait with 30 cm of snow or 15 cm of loose soil.

Limitations 8 through 13 inclusive

Use Limitations

1. Tablets inserted into a carcass should be placed deep in a horizontal cut to prevent scavenging birds from accessing the tablet.

2. For use only to control offending animals in areas where proper herd management is practiced to discourage predation.

3. Do not apply this product if species at risk (for example the swift fox) that may feed on Compound 1080 bait or on poisoned carcasses are present in your (local or specific) area. For information on species at risk in your area, contact the Fish and Wildlife Division of Alberta Sustainable Resource Development.

4. For use where verified predation of livestock or game production animals has occurred within the past 30 days.

5. For use by Alberta Fish and Wildlife Services personnel on public land where predation of domestic animals or other problems occur requiring coyote removal.

6. Sodium monofluoroacetate tablets must not be set nearer than 800 metres from the boundary of a hamlet, village, town or city, nor closer than 400 metres to a residence except that of the landholder who has approved the use of the tablets.

7. The user of tablets must remove and destroy all poisoned baits within 15 days of initial placement.

8. For use only by designated Fish and Wildlife Officers of the Alberta Government.

9. For use where verified wolf predation of domestic animals has recently occurred or where a serious threat to human safety exists.

10. For use only under official approval by the Minister responsible for wildlife, where predation has been identified as the primary factor affecting survival of a specific wildlife population.

11. Do not set bait within 800 metres of an inhabited dwelling.

12. To prevent hazard of secondary poisoning, any baits removed from use or the carcasses of poisoned coyotes or wolves must be burned or buried to a depth of 60 cm (2 feet). Vials and unused product must be disposed of in accordance with provincial requirements.

13. The user of tablets must immediately post warning signs at all normal access points to land where poisoned baits are set and remove signs at end of poison use.

14. The user of tablets must provide a copy of this label to the landholder on whose land tablets are being used.

15. The user of tablets must monitor and keep accurate records on the use of each poisoned bait.

16. The user of tablets must inspect poisoned bait at least every 7 days.

PRECAUTIONS:

KEEP OUT OF REACH OF CHILDREN AND UNAUTHORIZED PERSONNEL. Sodium monofluoroacetate is toxic to all warm-blooded animals. Store sodium mono- fluoroacetate tablets under lock and key in a dry place away from food, feed, domestic animals, and corrosive chemicals. Do not use in any manner that could contaminate food or feed. Wear gloves when handling tablets. Wash hands thoroughly before eating or smoking. Place poisoned baits to minimize non-target poisoning of wild and domestic animals. Keep dogs and cats on a leash or confined when poisoned baits are set.

DISPOSAL:

Burn unconsumed poisoned baits, toxicant containers and damaged or unusable tablets at high temperature or bury to a depth of 60 cm. For information on the disposal of unused, unwanted product and the cleanup of spills contact the provincial regulatory agency or the manufacturer.

FIRST AID INSTRUCTIONS: Speed is essential. Immediately cause vomiting by inserting a finger down the throat. Repeat until vomit fluid is clear. Then give 30 ml of Epsom salts in water. Have victim lie down and keep warm and quiet. Call a doctor or the Poison Control Centre (1-800- 3321414) immediately. TOXICOLOGICAL INFORMATION: Sodium monofluoroacetate poisoning results from fluoroacetate changing into fluoroacetate within cell mitochondria. Poisoning is characterized by a symptom-free period of 0.5 to 2 hours or longer between ingestion and onset of symptoms (nausea, vomiting, diarrhea, and hyperactive behaviour leading to convulsions). In monkeys, and presumably in humans, effects on the heart are the primary cause of death. The first symptoms of poisoning are changes of heart sounds and premature, weak contractions. No effective antidote is known, but treating the symptoms is effective in approximately 50% of human cases. Immediately cause a victim to vomit all stomach contents and give Epsom salts (magnesium sulphate). Compounds capable of supplying acetate ions give antidotal effects in animals including monkeys; the choice drugs are acetate and ethanol (2g/kg of each). A single dose of magnesium sulphate (800 mg/kg) injected into muscle as a 50 % solution has saved the life of rats dosed with lethal amounts of sodium monofluoroacetate.

Complete quiet and rest are required. Symptoms of non-lethal sodium monofluoroacetate poisoning will usually subside within 12 - 24 hours.

Registration Number	Registrant Name	Product Name	Registration Status
24512	ALBERTA GOVERNMENT/ALBERTA AGRICULTURE & FORESTRY	SODIUM MONOFLUOROACETATE RESTRICTED TOXIC COLLAR SOLUTION	REGISTERED

DANGER POISON

SODIUM MONOFLUOROACETATE

RESTRICTED TOXIC COLLAR SOLUTION PREDACIDE COYOTE CONTROL READ THE LABEL BEFORE USING GUARANTEE: Sodium monofluoroacetate 10 mg per ml solution REGISTRATION NO. 24512 PEST CONTROL PRODUCTS ACT NET CONTENTS: 60 ml collar device

ALBERTA GOVERNMENT/ ALBERTA AGRIGULTURE & RURAL DEVELOPMENT REGULATORY SERVICES DIVISION 304 - JG O'Donoguhe Building 7000 – 113 Street Edmonton, Alberta T6H 5T6

NOTICE TO USER: This pest control product is to be used only in accordance with the directions on the label. It is an offence under the Pest Control Products Act to use a control product in a way that is inconsistent with the directions on the label. The user assumes the risk to persons or property that arises from any such use of this product.

NATURE OF RESTRICTION: This product is for storage, use and handling only by persons authorized under the Alberta Agricultural Pests Act.

RESTRICTED USES:

COYOTE

Toxic Collar

Place toxic collars containing up to 60 ml of solution on sheep or goats where predation has occurred. Each toxic collar shall be monitored by the applicator or landholder at least every 48 hours.

Use Limitations

1. For use where there is active predation of sheep or goats.

2. Toxic collars must not be set nearer than 800 metres from the boundary of a hamlet, village, town or city, nor closer than 400 metres from a residence except that of the landholder who has approved the use of the collars.

3.The user must immediately post warning signs at all normal access points to land where toxic collars are in use and remove the signs when the collars are no longer used.

4. A copy of this label must be provided by the user to the landholder where toxic collars are set.

5. The user or the livestock owner must monitor toxic collars at least every 48 hours to keep accurate records on the use of each toxic collar.

PRECAUTIONS: KEEP OUT OF REACH OF CHILDREN AND UNAUTHORIZED PERSONNEL.

Sodium monofluoroacetate is toxic to all warm-blooded animals. Store toxic collars under lock and key in a dry place away from food, feed, domestic animals, and corrosive chemicals. Do not use in any manner that could contaminate food or feed. Wear gloves when handling. Wash hands thoroughly before eating or smoking. Remove guardian dogs from sheep or goats while toxic collars are set.

DISPOSAL:

Burn damaged or unusable toxic collars at high temperature, or bury to a depth of 60 cm. For information on the disposal of unused, unwanted product contact the provincial regulatory agency or the manufacturer. Contact the manufacture and the provincial regulatory agency in case of a spill, and for clean-up of spills. FIRST AID

INSTRUCTIONS:

Speed is essential. Immediately cause vomiting by inserting a finger down the throat. Repeat until vomit fluid is clear. Then give 30 ml of Epsom salts in water. Have victim lie down and keep warm and quiet. Call a doctor or the Poison Control Centre (1-800332-1414) immediately. Take container, label or product name and Pest Control Registration Number with you when seeking medical attention.

TOXICOLOGICAL INFORMATION:

Sodium monofluoroacetate (1080) poisoning results from fluoroacetate changing into fluorocitrate within cell mitochondria. Poisoning is characterized by a symptom-free period of 0.5 to 2 hours or longer between ingestion and onset of symptoms (nausea, vomiting, diarrhea, and hyperactive behaviour leading to convulsions). In monkeys, and presumably in man, effects on the heart are the primary cause of death. The first symptoms of poisoning are changes of heart sounds and premature, weak contractions. No effective antidote is known, but treating the symptoms is effective in approximately 50% of human cases. Immediately cause a victim to vomit all stomach contents and give Epsom salts (magnesium sulphate). Compounds capable of supplying acetate ions give antidotal effects in animals including monkeys; the choice drugs are acetate and ethanol (2 g/kg of each). A single dose of magnesium sulphate (800 mg/kg) injected into muscle as a 5- per cent solution has saved the life of rats dosed with lethal amounts of sodium monofluoroacetate. Complete quiet and rest are required. Symptoms of non-lethal sodium monofluoroacetate poisoning will usually subside within 12-24 hours.

Registration Number	Registrant Name	Product Name	Registration Status

25857	SASKATCHEWAN MINISTRY OF ENVIRONMENT*	SODIUM MONOFLUOROACETATE (COMPOUND 1080) PREDACIDE TABLETS	REGISTERED

SODIUM MONOFLUOROACETATE (Compound 1080) PREDACIDE TABLET FOR COYOTE AND WOLF CONTROL

READ THE LABEL BEFORE USING

KEEP OUT OF REACH OF CHILDREN AND PREVENT ACCESS BY UNAUTHORIZED PERSONNEL

RESTRICTED GUARANTEE: Sodium Monofluoroacetate… 5 mg/tablet

DANGER – DEADLY POISON

REGISTRATION NUMBER 25857 PEST CONTROL PRODUCTS ACT

NET CONTENTS: 30 DRAM

Saskatchewan Ministry of Environment, Fish and Wildlife Branch, 112 Research Drive, Saskatoon, Saskatchewan S7K 2H6 306-933-5767.

NOTICE TO USER: This pest control product is to be used only in accordance with the directions on the label. It is an offence under the Pest Control Products Act to use this product in a way that is inconsistent with the directions on the label. The user assumes the risk to persons or property that arises from any such use of this product

NATURE OF RESTRICTION: For storage, use, and handling only by Saskatchewan Ministry of Environment (MOE) personnel who are designated by MOE for that purpose, or by non-MOE personnel who are authorized by MOE for that purpose, provided that such designated or authorized persons are trained in the use of the product in accordance with the Saskatchewan Occupational Health and Safety Regulations (1996) and hold valid Pesticide Applicators Licenses under the Saskatchewan Pest Control Products Regulations (1995). The product used under this label is the property of MOE.

RESTRICTED USE

RESTRICTED USES: Coyote (Canis latrans) and Wolf (Canis lupus) control

DIRECTIONS FOR USE:

A) COYOTE

Single Dose Bait: Place one tablet into a bait of about 100 g (eg. chicken head). Place up to three of these poisoned baits at a coyote control site. Cover treated baits with 5 - 10 cm of soil, snow, vegetation, or other material to prevent exposure to birds.

Multi-Dose Bait: Place up to six tablets into a carcass at a coyote control site and then cover with 30 cm of snow or 15 cm of loose soil. For targeting specific individual coyotes, place up to three tablets into a coyote killed carcass at the predation site.

B) WOLF

Small Bait: Place three tablets into a bait of about 100 g. Conceal up to six of these baits under approximately 30 cm of snow or 15 cm of loose soil along trails leading to an unpoisoned carcass or in a circle around an unpoisoned carcass. Large Bait: Place up to twelve tablets into a carcass that is securely anchored. Cover the bait with 30 cm of snow or 15 cm of loose soil.

LIMITATIONS:

1. For use only in areas where there is proof satisfactory to Saskatchewan Ministry of Environment (MOE) that kills or harassment of domestic animals by predators have occurred within the past 30 days.

2. For storage, use, and handling only by Saskatchewan Ministry of Environment (MOE) personnel who are designated by MOE for that purpose, or by non-MOE personnel who are authorized by MOE for that purpose, provided that such designated or authorized persons are trained in the use of the product in accordance with the Saskatchewan Occupational Health and Safety Regulations (1996) and hold valid Pesticide Applicators Licenses under the Saskatchewan Pest Control Products Regulations (1995). For use only where predation of domestic animals or other problems occur requiring coyote/wolf removal and where there are no other practical alternative control measures.

3. For use only to control offending animals in areas where proper herd management is practiced to discourage predation.

4. Place baits at least 800 m from any inhabited dwelling (excluding that of the livestock owner) or from the boundary of any hamlet, village, town or city.

5. Warning signs must be immediately posted at all normal entry points to land where sodium monofluoroacetate is in use. (Signs must be removed upon completion of use).

6. The user of this product must provide a copy of this label to the landholder on whose land the product is being used.

7. The user of this product must inspect poisoned baits at least every 7 days and remove and destroy all poisoned baits within 15 days of initial placement.

8. To prevent hazard of secondary poisoning, any baits removed from use or the carcasses of poisoned coyotes or wolves must be burned or buried to a depth of 60 cm (2 ft.). Vials and unused product must be disposed of in accordance with provincial requirements.

9. In recognition of risk to certain endangered species, (swift fox, black-footed ferret), no poison may be placed in the restricted area of southern Saskatchewan, fixed by Saskatchewan Ministry of Environment, Fish and Wildlife Branch.

10. A complete record of the use of this product including the date and land location where baits were placed, the success, impact on non-target species and amount of toxicant used, must be maintained by all users of the product, and the information submitted yearly to the Fish and Wildlife Branch, 112 Research Drive, Saskatoon, Sask. S7K 2H6.

11. Sodium monofluoroacetate must be stored under lock and key in a dry place away from food, feed, domestic animals, and corrosive chemicals.

12. Tablets inserted into a carcass should be placed deep in a horizontal cut to prevent scavenging birds from accessing the tablet.

13. Do not apply this product if species at risk that may feed on Compound 1080 bait or on poisoned carcasses are present in your area. For information on species at risk in your area, contact the Saskatchewan Ministry of Environment, Fish and Wildlife Branch.

PRECAUTIONS:

KEEP OUT OF REACH OF CHILDREN AND PREVENT ACCESS BY UNAUTHORIZED PERSONNEL. EXTREMELY POISONOUS IF SWALLOWED. Do not get dry material from tablets in eyes, on skin, or on clothing. Wear rubber gloves when handling. After handling, wash hands thoroughly before eating or smoking. Sodium monofluoroacetate is toxic to all warm-blooded animals and may cause secondary poisoning in other animals. Place poisoned baits so as to minimize non-target poisoning of wild and domestic animals, especially dogs. Confine pets and domestic animals away from baited areas. Do not use in any manner that could contaminate feeds or foods.

FIRST AID:

Speed is essential. Immediately cause vomiting by inserting a finger down the throat. Repeat until vomit is clear, then give 30 mL of Epsom salts in water. Have victim lie down and keep warm and quiet. CALL A PHYSICIAN OR POISON CONTROL CENTRE IMMEDIATELY. Take container, label or product name and Pest Control Product Registration Number with you when seeking medical attention.

TOXICOLOGICAL INFORMATION:

Sodium monofluoroacetate poisoning results from fluoroacetate changing into fluorocitrate within cell mitochondria. Poisoning is characterized by a symptom-free period of 0.5 to 2 hours or longer between ingestion and onset of symptoms (nausea, vomiting, diarrhea, and hyperactive behavior leading to convulsions). In monkeys, and presumably in humans, effects on the heart are the primary cause of death. The first symptoms of poisoning are changes of heart sounds and premature, weak contractions. No effective antidote is known, but treating the symptoms is effective in approximately 50% of human cases. Immediately cause the victim to vomit all stomach contents and give Epsom salts (magnesium sulphate). Compounds capable of supplying acetate ions give antidotal effects in animals including monkeys; the choice drugs are acetate and ethanol (2 g/kg of each). A single dose of magnesium sulphate (800 mg/kg) injected into muscle as a 50% solution has saved the life of rats dosed with lethal amounts of sodium monofluoroacetate. Complete quiet and rest are required. Symptoms of non-lethal sodium monofluoroacetate poisoning will usually subside within 12-24 hours.

STORAGE:

Keep in locked storage in a dry place away from food, feed, domestic animals, and corrosive chemicals.

DISPOSAL:

Dispose of all vials, containers, and unused product in accordance with provincial regulations, which require that they be disposed of by a provincially registered hazardous waste disposal company. Poisoned animal carcasses may be disposed of by burning or burying to a depth of 60 cm (2 ft.).

Registration Number	Registrant Name	Product Name	Registration Status
28865	SASKATCHEWAN MINISTRY OF ENVIRONMENT*	SODIUM MONOFLUOROACETATE - TOXIC COLLAR SOLUTION	REGISTERED

SODIUM MONOFLUOROACETATE PREDACIDE COYOTE CONTROL

RESTRICTED TOXIC COLLAR SOLUTION READ THE LABEL BEFORE USING

GUARANTEE: Sodium monofluoroacetate 10 mg per ml solution

REGISTRATION NO. 28865

PEST CONTROL PRODUCTS ACT NET CONTENTS: 60 ml collar device

GOVERNMENT OF THE PROVINCE OF SASKATCHEWAN Environment Fish and Wildlife Branch 112 Research Drive Saskatoon, Saskatchewan 1-306-933-5767 S7K 2H6

NOTICE TO USER:

This pest control product is to be used only in accordance with the directions on the label. It is an offence under the Pest Control Products Act to use this product in a way that is inconsistent with the directions on the label. The user assumes the risk to persons or property that arises from any such use of this product. The product used under this label remains the property of the Saskatchewan Government.

NATURE OF RESTRICTION:

This product is for storage, use and handling only by persons authorized by Saskatchewan Environment.

RESTRICTED USES:

COYOTE Toxic Collar

Place toxic collars containing up to 60 ml of solution on sheep or goats where predation has occurred. Each toxic collar shall be monitored by the applicator or landholder at least every 48 hours.

Use Limitations

1. For use where there is active predation of sheep or goats.

2. Toxic collars must not be set nearer than 800 metres from the boundary of a hamlet, village, town or city, nor closer than 400 metres from a residence except that of the landholder who has approved the use of the collars.

3. The user must immediately post warning signs at all normal access points to land where toxic collars are in use and remove the signs when the collars are no longer used.

4. A copy of this label must be provided by the user to the landholder where toxic collars are set.

5. The user or the livestock owner must monitor toxic collars at least every 48 hours to keep accurate records on the use of each toxic collar.

PRECAUTIONS: KEEP OUT OF REACH OF CHILDREN AND UNAUTHORIZED PERSONNEL.

Sodium monofluoroacetate is toxic to all warm-blooded animals. Store toxic collars under lock and key in a dry place away from food, feed, domestic animals, and corrosive chemicals. Do not use in any manner that could contaminate food or feed. Wear gloves when handling. Wash hands thoroughly before eating or smoking. Remove guardian dogs from sheep or goats while toxic collars are set.

DISPOSAL:

Burn damaged or unusable toxic collars at high temperature, or bury to a depth of 60 cm. For information on the disposal of unused, unwanted product contact the provincial regulatory agency or the manufacturer. Contact the manufacture and the provincial regulatory agency in case of a spill, and for clean-up of spills.

FIRST AID INSTRUCTIONS:

Speed is essential. Immediately cause vomiting by inserting a finger down the throat. Repeat until vomit fluid is clear. Then give 30 ml of Epsom salts in water. Have victim lie down and keep warm and quiet. Call a doctor or the Poison Control Centre (1-866454-1212) immediately. Take container, label or product name and Pest Control Registration Number with you when seeking medical attention.

TOXICOLOGICAL INFORMATION:

Sodium monofluoroacetate (1080) poisoning results from fluoroacetate changing into fluorocitrate within cell mitochondria. Poisoning is characterized by a symptom-free period of 0.5 to 2 hours or longer between ingestion and onset of symptoms (nausea, vomiting, diarrhea, and hyperactive behaviour leading to convulsions). In monkeys, and presumably in man, effects on the heart are the primary cause of death. The first symptoms of poisoning are changes of heart sounds and premature, weak contractions. No effective antidote is known, but treating the symptoms is effective in approximately 50% of human cases. Immediately cause a victim to vomit all stomach contents and give Epsom salts (magnesium sulphate). Compounds capable of supplying acetate ions give antidotal effects in animals including monkeys; the choice drugs are acetate and ethanol (2 g/kg of each). A single dose of magnesium sulphate (800 mg/kg) injected into muscle as a 50 per cent solution has saved the life of rats dosed with lethal amounts of sodium monofluoroacetate. Complete quiet and rest are required. Symptoms of non-lethal sodium monofluoroacetate poisoning will usually subside within 12-24 hours.