

Minister of Health and the Minister
for the Federal Economic Development
Initiative for Northern Ontario



Ministre de la Santé et Ministre de
l'Initiative fédérale du développement
économique dans le Nord de l'Ontario

Ottawa, Canada K1A 0K9

DEC 21 2007

Mr. Joel M. Theriault
Environmental Coordinator, Air Ivanhoe Limited
P.O. Box 99
Foleyet, Ontario P0M 1T0

Dear Mr. Theriault:

This is in response to your environmental petition no. 214 of August 13, 2007, addressed to Mr. Ronald Thompson, the Interim Commissioner of the Environment and Sustainable Development (CESD).

In your petition you raised a number of questions in relation to the application of herbicides in Northern Ontario forestry operations.

I am pleased to provide you with Health Canada's response to your petition. I understand that the Ministers of the Environment and of Fisheries and Oceans will be responding separately to questions which come under the purview of their respective departments.

I appreciate your interest in this important matter, and I hope that you will find this information useful.

Yours sincerely,

A handwritten signature in black ink, appearing to read 'Tony Clement', written over a white background.

Tony Clement

Enclosure

c.c. The Honourable John Baird, P.C., M.P.
The Honourable Loyola Hearn, P.C., M.P.
Mr. Ronald C. Thompson, Interim CESD

Canada

Health Canada's response to specific questions:

3. Disclose and produce all information the responsible government agencies may possess (or have knowledge of) in regards to human and animal health effects from exposure (both long term at low dosages and short term at high dosages) to glyphosate and 2,4-D (both alone and in combination). Such mixing may occur when run off from separate spray blocks run into the same water body as well as when animals consume vegetation from multiple spray blocks, sprayed with different herbicides.

Pesticides in Canada are regulated by the federal government under the *Pest Control Products Act* (PCPA) and Regulations. Health Canada's Pest Management Regulatory Agency (PMRA) is responsible for administering the Act, including registration of new pest control products and re-evaluation of older products to ensure the continued safety and value of registered pest control products.

Pesticides are stringently regulated in Canada using modern, internationally recognized methods of scientific risk assessment before they are approved for use or sale. Health Canada is committed to protecting human health and the environment by minimizing the risks associated with pest control products. Only those products that demonstrate an acceptable risk are registered for use in Canada.

Applicants wishing to register a pest control product are required to provide an extensive battery of environmental and health studies to support the product's proposed uses in Canada. The studies must be conducted in compliance with internationally accepted study protocols and Good Laboratory Practice. Environmental and health toxicology studies are submitted by applicants and reviewed by Health Canada scientists as part of the registration process.

Appended to this response is a list of published documents and literature that review the health and environmental effects of the two herbicides. The list should not be considered as exhaustive.

Glyphosate

The publication: "*Discussion Document D91-01 Pre-harvest use of glyphosate*" is available on the PMRA web site and contains summaries of information provided in support of glyphosate registrations prior to 1991. Summaries of acute and chronic effects of glyphosate are included in the document. Subsequent reviews of studies submitted to the Pest Management Regulatory Agency in support of glyphosate registrations and applications have all reached the same conclusions. The studies were submitted as a condition of registration and are considered confidential business information and thus cannot be released.

Extensive information on the ecotoxicity of glyphosate is also available on the internet: Environmental Health Criteria 159 (EHC 159, 1994), Re-registration Eligibility Decision (RED) Glyphosate (U.S. EPA, 1993), and European Commission review report 6511/VI/99-final (2002).

2,4-D

The PMRA recently completed the re-evaluation of 2,4-D and examined a number of published and unpublished toxicology studies. The acute and chronic effects of 2,4-D to terrestrial and aquatic health are included in publication: *Re-evaluation of the Agricultural, Forestry, Aquatic and Industrial Site Uses of 2,4-D, PACR 2007-05*, which is available on the PMRA's website. The PMRA human health risk assessment does not require toxicity studies in which human subjects are intentionally dosed with pesticides to identify or quantify their effects. However, epidemiology studies in the published literature have been used as part of the toxicology assessment of 2,4-D.

Additional information on the assessment of 2,4-D is available on the internet and in the published literature. Currently, the PMRA is in the process of addressing comments received in response to the most recent proposal (PACR2007-05, noted above). After careful consideration of all comments received, the PMRA will publish a final decision on all products containing 2,4-D, along with responses to the most recent comments and a full reference list of all data and information reviewed. This will include an extensive list of published and publically available information. Confidential test data will be available for inspection by the public in the reading room.

Glyphosate and 2,4-D in combination

The PMRA requires laboratory toxicity studies on standard surrogate species in order to predict effects of active ingredients and their formulations on non-target species. The PMRA does not receive information concerning environmental interactions with other pesticides when considering registration of pesticides in Canada. However, should new information indicate there is cause for concern for a particular pesticide combination, the information will be reviewed and regulatory action would be taken if the evidence warrants it.

Question 5. Require water sampling for herbicides and their residues at all northern Ontario municipal water plants during, and for a short time after, the 2007 herbicide spray season and beyond.

Health Canada works with the provinces and territories to develop the Guidelines for Canadian Drinking Water Quality, which are used by all jurisdictions in Canada as a basis to establish their own requirements for drinking water quality. Some guidelines have been developed for herbicides (atrazine, bromoxynil, cyanazine, dicamba, 2,4-D, diclofop-methyl, dinoseb, diquat, diuron, glyphosate, metolachlor, metribuzin, paraquat, picloram, simazine, trifluralin), but they do not establish monitoring requirements. These would be determined by each jurisdiction, depending on their legislation.

6. Disclose and produce all information the responsible government agencies may possess (or have knowledge of) in regards to testing for ground and surface water contamination of both glyphosate and 2,4-D in Northern Ontario

As previously mentioned, Health Canada works with the provinces and territories to develop the Guidelines for Canadian Drinking Water Quality, which are used by all jurisdictions in Canada as a basis to establish their own requirements for drinking water quality. Guidelines have been developed for glyphosate and 2,4-D, but they do not establish monitoring requirements. These would be determined by each jurisdiction, depending on their legislation.

For Ontario, the provincial government has established a comprehensive framework of laws and regulations to protect the safety and quality of drinking water.

Question 8) Disclose and produce all information the responsible government agencies may possess (or have knowledge of) in regards to the impact of glyphosate and 2,4-D (both alone and in combination) to amphibians, including the Blue Spotted Salamander, a protected amphibian under schedule 10 of the Fish and Wildlife Conservation, 1997, S.O. 1997, CHAPTER 41.

The PMRA requires laboratory toxicity studies on standard surrogate species in order to predict effects of active ingredients and their formulations on non-target species. Specific information related to the impacts of glyphosate or 2,4-D on the Blue Spotted Salamander is not available.

Glyphosate

At the time of registration of the glyphosate forestry product, Vision, in 1987, toxicity data specific to amphibians were not available to the Canadian regulatory authority. This is also true for the agricultural glyphosate formulation, Roundup, which was first registered in 1976.

The PMRA generally considers studies published after initial registration when a pesticide undergoes re-evaluation. The PMRA may examine new studies published in the scientific literature, along with incident reports, and take regulatory action prior to re-evaluation, if warranted.

Some recent studies of amphibians published in the scientific literature are listed below. The list should not be considered exhaustive.

2,4-D

The effects of 2,4-D acid and the amine derivatives on amphibians are presented in the World Health Organization/Food and Agriculture Organization Evaluation of 2,4-D listed below.

Glyphosate and 2,4-D in combination

The PMRA does not receive information concerning environmental interactions with other pesticides when considering registration of pesticides in Canada. However, should new information indicate there is cause for concern for a particular pesticide combination, the information would be reviewed and regulatory action would be taken if the evidence warrants it.

Question 9) Disclose and produce all information the responsible government agencies may possess (or have knowledge of) in regards to the impact of glyphosate and 2,4-D applications to fish and other aquatic life native to Northern Ontario waterways and the arctic (the final resting place for many of these chemicals).

The PMRA requires laboratory toxicity studies on standard surrogate species in order to predict effects of active ingredients and their formulations on non-target species. The effects of

glyphosate or 2,4-D to organisms native to Northern Ontario waterways and the Arctic are expected to be within the range of effects observed in the laboratory tests on surrogate species.

Glyphosate

Based on its physical chemical properties, glyphosate is not expected to be subject to long range transport. Studies submitted as a condition of registration to the Pest Management Regulatory Agency in support of glyphosate registrations and applications are considered confidential business information and cannot be released. However, the Discussion Document D91-01 Pre-harvest use of glyphosate (Agriculture Canada, 1991) is available on the PMRA web site and contains summaries of information provided in support of glyphosate registrations prior to 1991. Effects of glyphosate on fish and other aquatic life relevant to Canada are summarized in the document.

In addition, extensive information on the ecotoxicity of glyphosate to fish and other aquatic life is available on the internet: Environmental Health Criteria 159 (EHC 159, 1994), Re-registration Eligibility Decision (RED) Glyphosate (U.S. EPA, 1993), and European Commission review report 6511/VI/99-final (2002).

2.4-D

The toxicity of 2,4-D to fish and other aquatic life is summarized in the Proposed Acceptability for Continuing Registration PACR 2007-06 which is available on the PMRA website.

Additional references (The list should not be considered as exhaustive):

Agriculture Canada. 1991. Pre-harvest use of glyphosate. Discussion Document D91-01. Pesticide Directorate, Food Production & Inspection Branch, Agriculture Canada, Ontario.
http://www.pmra-arla.gc.ca/english/pdf/prdd/prdd_d9101-e.pdf

Australian Pesticides and Veterinary Medicine Authority. 2006. Reconsideration of Approvals of the Active Constituent 2,4-D, Registrations of Products Containing 2,4-D and Their Associated Labels, Preliminary Review Findings (Environment) Part 1, 2,4-D Esters. Vol 2 Technical Report. April 2006.
http://www.apvma.gov.au/chemrev/downloads/2_4_d_prf_esters.pdf

Edginton, AN; Sheridan, PM; Stephenson, GR; Thompson, DG and HJ Boermans. 2004. Comparative effects of pH and Vision herbicide on two life stages of four anuran amphibian species. *Environmental Toxicology and Chemistry*, vol. 23, No. 4, pp. 815-822.
<http://www.setacjournals.org/archive/1552-8618/23/4/pdf/i1552-8618-23-4-815.pdf>

EHC 159. 1994. Environmental Health Criteria 159: Glyphosate. Published under the joint sponsorship of the United Nations Environment Programme, the International Labour Organisation, and the World Health Organization. WHO, Geneva.
<http://www.inchem.org/documents/ehc/ehc/ehc159.htm>

European Commission. 2002. Glyphosate. 2001/99/EC - OJ L304, 21.11.2001.
http://europa.eu.int/comm/food/plant/protection/evaluation/existactive/list1_glyphosate_en.pdf

Giesy, JP; Dobson, S; and KR Solomon. 2000. Ecotoxicological risk assessment for Roundup® herbicide. *Reviews of Environmental Contamination and Toxicology* vol.167, pp. 35-120.

Howe, CM; Berrill, M; Pauli, BD; Helbing, CC; Werry, K and N Veldhoen. 2004. Toxicity of glyphosate-based pesticides to four North American frog species. *Environmental Toxicology and Chemistry*, vol. 23, No. 8, pp. 1928-1938.

Mann, RM and JR Bidwell. 1999. The toxicity of glyphosate and several glyphosate formulations to four species of Southwestern Australian frogs. *Archives of Environmental Contamination and Toxicology*, vol. 36, pp. 193-199.

Palmer, S.J. and H.O. Krueger. 1997. 2,4-D 2-Ethylhexyl Ester. A 96 hour Static Acute Toxicity Test With the Leopard Frog Tadpoles (*Rana pipiens*). Wildlife International Project No. 467A-101. 70 p.

Perkins, PJ; Boermans, HJ and GR Stephenson. 2000. Toxicity of glyphosate and triclopyr using the frog embryo teratogenesis assay-*Xenopus*. *Environmental Toxicology and Chemistry*, vol. 19, No. 4, pp. 940-945.

Pest Management Regulatory Agency. 2005. Proposed Acceptability for Continuing Registration PACR 2005-01. Re-evaluation of the Lawn and Turf Uses of (2,4-Dichlorophenoxy)acetic Acid [2,4-D]. February 21, 2005. Health Canada, Ottawa, Ontario. <http://www.pmra-arla.gc.ca/english/pdf/pacr/pacr2005-01-e.pdf>

Pest Management Regulatory Agency. 2007. Proposed Acceptability for Continuing Registration PACR 2007-06. Re-evaluation of the Agricultural, Forestry, Aquatic and Industrial Uses of (2,4-Dichlorophenoxy) acetic Acid [2,4-D]. June 19, 2007. Health Canada, Ottawa, Ontario. <http://www.pmra-arla.gc.ca/english/pdf/pacr/pacr2007-06-e.pdf>

Pest Management Regulatory Agency. 2006. Re-evaluation Note REV 2006-11. Lawn and Turf Uses of (2,4-Dichlorophenoxy)acetic Acid [2,4-D] Interim Measures. August 16, 2006. Health Canada, Ottawa, Ontario. <http://www.pmra-arla.gc.ca/english/pdf/rev/rev2006-11-e.pdf>

Relyea, RA. 2005. The lethal impact of RoundUp on aquatic and terrestrial amphibians. *Ecological Applications* 15: 1118-1124.

Relyea, RA. 2006. The impact of insecticides and herbicides on the biodiversity and productivity of aquatic communities: Response. *Ecological Applications* 16(5):2027-2034.

Solomon, K and D Thompson. 2003. Ecological risk assessment for aquatic organisms from over-water uses of glyphosate. *Journal of Toxicology and Environmental Health Part B: Critical Reviews*, vol. 6, no. 3, pp. 289-324.

Takahashi, M. 2007. Oviposition site selection: pesticide avoidance by gray treefrogs. *Environmental Toxicology and Chemistry* 26(7):1476-1480.

Thompson, DG. 2003a. Multiple stressor effects on native amphibians. Frontline Express, Canadian Forest Service, Great Lakes Forestry Centre, Bulletin No. 30.

Thompson, DG. 2003b. TSRI # 121 - Multiple Stressors: Effects on native amphibian species of forested environments. http://www.hc-sc.gc.ca/hecs-secs/tsri/research/tsri_121.htm

Thompson, DG; Wojtaszek, BF; Staznik, B; Chartrand, DT and GR Stephenson. 2004. Chemical and biomonitoring to assess potential acute effects of Vision herbicide on native amphibian larvae in forest wetlands. Environmental Toxicology and Chemistry, Vol. 23, No. 4, pp. 843-849.

Thompson, DG, Solomon, KR, Wojtaszek, BF, Edginton, AN, and Stephenson, GR. 2006. The impact of insecticides and herbicides on the biodiversity and productivity of aquatic communities. Ecological Applications 16(5):2022-2027.

United Kingdom Ministry of Agriculture, Forestry and Food. 1993. Evaluation of 2,4-Dichlorophenoxy acetic acid and its salts and esters. Pesticides Safety Directorate. Issue No. 102. N. 68, 186 p.
http://www.pesticides.gov.uk/PSD_PDFs/Evaluations/068_2,4-D.pdf

United States Environmental Protection Agency. 2005. Reregistration Eligibility Decision (RED) for 2,4-D. Office of Pesticide Programs. EPA 738-R-05-002. June 2005. 320 p.
http://www.epa.gov/oppsrrd1/REDs/24d_red.pdf

U.S. EPA (1993) Re-registration Eligibility Decision (RED) Glyphosate. Office of Prevention, Pesticides And Toxic Substances, EPA 738-R-93-014. September 1993.
http://www.epa.gov/oppsrrd1/REDs/old_reds/glyphosate.pdf

Wojtaszek, BF; Staznik, B; Chartrand, DT; Stephenson, GR and DG Thompson. 2004. Effects of Vision herbicide on mortality, avoidance response, and growth of amphibian larvae in two forest wetlands. Environmental Toxicology and Chemistry, vol. 23, No. 4, pp. 832-842.

World Health Organization/Food and Agriculture Organization. Pesticide Residues in Food - 1998. Toxicological and Environmental Evaluations.(Joint Meeting of the Panel of Experts on Pesticide Residues in Food and the Environment and the WHO Core Assessment Group). Lyon, France. WHOIPCS/98.6. 346 p.